COMPARATIVE ASSESSMENT OF E-PARTICIPATION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

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Abstract

Most e-participation research focuses on the use and the direct effects of the participation processes (outcome). However, the long-term effects and hence the sustainability of the results (impact) is even more important to finally assess the success of the participation process. The European research project e2democracy (*e*lectronic *e*nvironmental democracy) explores participation projects for their effects on political decision-making and on the participants' behaviour. Over a period of 2 years, two participation procedures in two to three cities in three countries - Austria, Germany and Spain - are investigated.
To make the results of the cities in the participating countries comparable, the form of participation in all participating cities is the same: It is a citizen panel where a continuous exchange of information and experience among participants and experts is organised and where climate-relevant consumption data is being collected and analyzed every two months. First results are available for the city of Bremen where the citizen panel was started in March 2010 and where we can reflect upon one full year of participatory activities and monitoring.

Introduction

In view of the pressing problems of climate change, the European nations meet the challenge of reducing CO_2 emission in the EU by 20 % until 2020 (starting from 1990). Adaptations of the target appear on the agenda every now and then, so that the target of 25 % will probably be decided on still in 2011. Some states have defined higher targets for themselves, such as Germany with 40 % until 2020. But commitments to reduce CO_2 emission have not only been made at national and international level. Also at local level, many cities and communities committed themselves to contribute their share to climate protection. However, politics and administration will not be able to reach these ambitious targets if they do not involve business and citizens. At local level, at many places alliances between administration and businesses have developed in order to follow a coordinated course of action for climate protection with a manageable number of participants. As especially industry and major enterprises belong to the big emitters, the reduction potential is accordingly large. This approach makes sense, not only from the point of view of efficiency.

However, at local level, the contribution to climate protection citizens can make is not yet paid enough attention. Citizen participation at local level primarily reaches organized groups resp. their representatives. Direct participation of citizens in climate protection is more the exception than the rule. Thus the chances to explore the possibilities of private households and to tap this potential remain unused. The European research project e2democracy (*e*nvironmental *e*lectronic democracy) uses this gap and offers interested cities and regions a field experiment employing the same kind of participation processes on the same subject - climate saving.

The e2democracy - project on the impact and effectiveness of citizen (e-) participation in climate saving

In e2democracy, between the local/regional authority, a group of citizens as well as a number of companies a negotiated agreement concerning goals of CO_2- reduction and energy savings has been concluded. The general target has been set to 2% energy saving / CO_2-reduction per year. Based on such a contract, consumption data of all participants are regularly reported in a verifiable way for all partners and the public. More precisely, the measurement is carried out by means of so-called CO_2-calculators during a period of two years. Users regularly enter their consumption data either in an online CO_2 calculator or its equivalent on paper (CO_2-housekeeping book). Participants receive individual feedback by detailed analyses of their consumption in form of CO_2-balances and can compare their results with the results of the other panellists and the average in their country. Offerings for exchange of experience among participants and with experts, discussions and other information sources complete the learning process in such so-called citizen panels. Based on this, participants learn the set up of their individual CO_2 balance, the links between the different areas of life and their relevance for their CO_2-balance and are enabled to make valuable decisions for a more sustainable and responsible lifestyle.

Methodological Background

From the scientific point of view the e2democracy-project, which is funded by the European Science Foundation (ESF), the Austrian Science Fund (FWF), the German Research Funding Organization DFG, and the Spanish Ministry of Science and Innovation, explores

participation projects for their effects on energy saving, CO_2-reduction and participants' behaviour. Another central question is whether the quality and effects of a participation procedure depend on the mode of participation, either via Internet or by traditional means.

Quite a number of e-participation projects have been funded during the past years by the EU or other organization, however, seldom have attempts been made to assess their effects and impacts. In 2005, an OECD report on Evaluating Public Participation in Policy Making concludes that there is an "evaluation gap" and that "evaluation of public participation is still in its infancy". This evaluation gap exists for traditional forms of citizens´ participation as well as for those supported by electronic means. Even though many (e-) participation projects have been evaluated in the meantime, there is still a lack concerning the assessment of the quality on the one hand and on the longevity and sustainability of the participation results (impact) [s. OECD] on the other. Generally, evaluation stops by assessing short-term and direct effects (outcome). So the question is for example whether the participatory budget has been improved or the environmental pollution has been reduced due to precedent participation processes or not.

With e2democracy particularly the long-term effects and the sustainability of participation shall be evaluated in the area of climate saving as - compared to many areas in the public domain - the impact of participation can principally be measured in hard figures by the amount of avoided CO_2-emissions and savings in energy consumption; given that participants can be evaluated over a longer period of time.

Methodological constraints

Generally it has to be stated that the assumption that the impact of the citizen panel on the reduction of CO_2-emissions and energy consumption can be measured in reliable quantitative terms (e.g. kilograms or kWh) was not realistic. Why? There are several constraints that influence the results and that makes it complicated to figure out whether the 2% savings target could have been achieved in the first year or not. The most important aspects are:

Lifestyle changes are long-term affairs that are not reflected ad hoc in countable savings. Certainly, changes often go slowly and remarkable savings may be reached over longer periods. Considering cost-intensive investments like for insulation, new windows or a new CO_2-depleted car, it is obvious that taking decisions for such climate-friendly measures require changes in thinking and behaviour beforehand.

The validity of data entered by panellists. Data is entered by panellists and the correctness of this data can't be validated by the project. Besides typing errors, users may insert estimated, incomplete or false values. For this reason panellists were asked to check their entries and - if necessary - correct them. However, users can't be forced to do so but only asked. Moreover, third parties can't recognize false values. Only eye-catching values strongly differing from previous or following entries or that are outside the standard deviation can be recognized (plausibility checks). In these particular cases users were again asked to correct them. If they didn't, data sets have to be excluded from the assessment.

Missing values. In a reasonable number of cases, single values are missing. Either they have been forgotten to enter by panellists or the value couldn't be collected for some reason. In

some cases, users have no access to a particular meter or there is no particular meter at all, e.g. for oil-heatings or where several flats share one single meter. Also here, data sets have to be excluded from the assessment.

Change of life situation, e.g. in case of moving or birth of a child. Such events change the basis for the calculation and hence the development of individual balances. Though such fundamental changes can be reported in the CO_2-calculator, the development of the individual CO_2-balance can't be assessed together with the other balances as the basis has changed.

Climate conditions. Even though the assessment covers all four seasons, these can still vary compared to the seasons of previous or following years. In colder times, CO_2-emissions caused by heating and electricity are generally higher than in warmer months.

Fluctuation of participants. Not all participants that have registered at the beginning are still active in the project. Moreover, many participants have registered later on and hence missed the one or the other periodic measurement. Valuable assessments are only possible for those individual balances that cover exactly 6 or 12 periodic measurements, i.e. one or two full years of monitoring.

Complexity and restricted user friendliness of the CO_2-calculator. Currently, the CO_2-calculator lacks user-friendliness particularly for users who are not that familiar with such web-applications and/or with the complex issue of CO_2-balancing. A major task is the editing of the basic measurement that affords a good knowledge of the own consumption data of the last year and requires the definition of the individual living-situation (e.g. size of household and flat, age of electronic devices, type of cars, general nutrition and consumption behaviour). As the CO_2-calculator is based on entries covering a 2-months period, the basic measurement has to be fed with values of the previous year for an average 2-months period. This requires additional calculation for users. In many cases this has caused frustration and/or errors in the data sets. As a result many users got afraid of using the online CO_2-calculator and resigned from the participation project.

Flights are differently considered in the basic measurement than in the subsequent periodic measurements. As the basic measurement requires entries covering an average 2-months period of the previous year, for technical reasons it was not possible to enter flights in the basic measurement. Instead, for every participant the national average of 0.14 tons CO_2 (Austria and Germany) is calculated. What seems to be appropriate for the completeness of the basic measurement and to overcome the technical problems raises difficulties in the assessment of the development of individual CO_2-balances. For example, a person who did not travel by air in the last year and none in the current one automatically improves his/her balance by these 0.14 tons without conducting any changes. On the other hand, a person who often went by plane in the previous year but only a few times in the current year automatically falls off in quality even though he/she has reduced CO_2-emissions from flights.

Comparative Assessment - First Results

Citizen panels on climate saving have been started in the cities/regions of Bremen, Bremerhaven, and Wennigsen in Germany, Bregenz and Mariazeller-Land in Austria, and Pamplona and Saragossa in Spain. The first participation process started in Bremen in

March 2010. Others followed later on, with the most recent one in Wennigsen in May 2011. At the time of writing, measurements ranging one full year and hence covering the four seasons are the citizen-panels in Bremen and Mariazeller-Land. However, though the citizen panel in Mariazell is already running for more than one year, due to a very small number of panellists an assessment based on quantitative figures is not recommended or even impossible. A distinction will be made for the qualitative assessment later on. Hence, the analysis so far is based on the Bremen-panel. Findings of the other citizen-panels are included where useful and appropriate.

For the quantitative results, the problems as stated above in the methodological constraints sections have been tackled to the best possible degree in order to provide for a most valuable assessment. Even though the methodological constraints have to be taken into account when interpreting these results, in particular as the number of considered cases had to be reduced to a wide extent. On the other side, the importance of qualitative assessment increased. Qualitative measures are mainly carried out by surveys, face-to-face discussions and direct feedback of panellists. Insight in the preliminary results shall be given by answering the following research questions:

- Will the participation lead to energy savings and reduction of CO_2?
- Will participants of participation procedures on climate saving change their behaviour in this respect?
- Do quality and effects of a participation procedure depend on the mode of participation, either via Internet or by traditional means?
- Would the results have been the same without citizen participation?

Will the participation lead to energy savings and reduction of CO_2?

For most of the panellists the answer is yes.

For the quantitative assessment, two ways of calculation have been chosen, the assessment by counting the number of individual CO_2-balances that have been improved in the first year of measurement and the overall CO_2-balance, covering all panellists altogether.

Even though more than 200 citizens have registered for the Bremen-project, only about 2/3 entered the basic measurement and after one year only about 1/3 are still active. Considering the methodological constraints stated above and disabling incomplete data sets, 56 panellists that entered the basic measurement and at least 6 periodic measurements went into analysis.

Out of these 62.5% have improved their CO_2-balance, and 37.5 declined. I.e. the majority seem to be successful in their efforts to reduce CO2. As the target is to reduce the Co_2-emission by 2% per year, 59% have met or exceed this goal.

Considering the whole Bremen-panel, i.e. the overall balance of all panellists altogether, the saving target has been met resp. exceeded by 3.0% CO_2-reduction. In the basis measurement, the average CO_2-emission per panellist for a two-months period is at 1,735 tons. The average CO_2-emission of the first six periodic measurements is at 1,682 tons.

Excluding the CO_2-emissions caused by flights (see also methodological constraints above), the savings even amount to 4.1%.

As panellists not only committed themselves to reduce CO_2 but also energy consumption, the saving results for electricity have also been analyzed. The results are almost the same as for the reduction of CO_2: 63% reduced their electricity consumption. However, this does not mean that all those who have reduced their CO_2-emission also reduced their electricity consumption. Only 56% of them have reduced their electricity consumption; 36% raised it (8% are not considered in the CO_2-balance due to missing values). I.e. there doesn't seem to be a strong relationship between individual efforts to reduce CO_2 and to save electricity. A hypothesis in e2democracy was, however, that people who take care for the environment and optimize their CO_2-balance also strive to saving energy and other resources. Further investigation for other energy forms and in the other e2democracy cities are necessary to verify this preliminary result.

Will participants of participation procedures on climate saving change their behaviour in this respect?

Changes in behaviour are measured in e2democracy in a standardized mode by surveys among the panellists and by analysis of CO_2-calculator data as well as in a rather unstructured way by individual feedback and discussions. The survey evaluating these changes is currently underway and first results will be expected by winter 2011. However, from feedback and discussions and also by consulting the CO_2-calculator database, changes in behaviour are already evident.

For example, during the first year and already before the disaster in Fukushima, 1/8 of all panellists in Bremen changed their type of electricity from the general electricity mix to green electricity. Even though changing the electricity provider is a simple task, this can be interpreted as a success considering the natural inertness of the general public for such tasks.

A lot of interesting discussions at meetings, on the telephone, in the projects' online-fora, and by email show an increased interest for the topic and has led to learning effects and hence to the sensitization for climate protection. This starts by reporting the purchase of utilities for water saving or electronic saving bulbs, to the consideration of the CO_2-emissions at the recent vehicle purchase to the announcement of insulating the home or changing the heating system in the near future. These are only a few examples of individual feedback. If only the half or one third of them become true, changes of behaviour have been initiated or endorsed by the citizen-panel.

In a critical review of the gathered data and feedback, there seems to be a tendency by panellists to optimize one or several certain subareas of their individual CO_2-balances. While there will be efforts - for example - in the subareas of electricity or nutrition, other subareas like mobility or housing remain untouched. Optimizing certain sub-areas does not necessarily mean a change in the general behaviour, if no efforts are made also in the other sectors. I.e. the overall linkage of all CO_2-relevant areas seems not to be in the foreground for many panellists. Moreover, the installation of saving utilities or the change of electricity provider are small, though important steps on the way to reduce CO_2-emissions, however, it does not need much engagement to carry out these steps. It has to be evaluated whether the

individual commitment to reduce CO_2-emissions stops after the easy-to-do-changes have been employed.

Investing in saving utilities has the nice side-effect of saving money through reduced consumption costs and changing to green electricity is a question of lifestyle and modernity. It has to be asked whether climate protection is an aim of itself and hence measures are expandable or if it is driven by other reasons and emerges as a kind of positive side-effect. I.e. other reasons are equally or even more important than reaching the objective of climate protection.

Another critical issue reported by panellists is the competition of the climate-protection target with other aspects of individual lifestyle choices. It is a question of prioritizing between - for example - a vacation trip by plane and climate protection or between the use of a car for inner city rides and the reduction of CO2-emissions. Only a long-term evaluation will show whether rather fundamental changes will occur and CO_2-emissions can be reduced in favour of reaching the target of climate protection.

Do quality and effects of a participation procedure depend on the mode of participation, either via Internet or by traditional means?

The distribution of onliners to offliners with at least 6 periodic measurements and valuable data sets is 70 : 30. I.e. the great majority of panellists are onliners. Seen from the beginning of the Bremen-panel, the ratio between onliners and offliners continuously changed in favour of offliners. This is because the number of offliners has slightly increased while the number of onliners decreased drastically over time. Altogether 190 onliners registered for the project. A bit more than 100 entered the basic measurement, i.e. almost the half of the registered dropped off before the creation of the basic measurement respectively broke off during the data collection process. Out of the 100+, 70 carried out at least one periodic measurement and after one year, about 45 are actively participating with at least 6 periodic measurements. I.e. the drop-off quote of onliners is at ca. 75%.

In comparison 25 offliners have registered for the Bremen-panel. 4 dropped out before the basic measurement took place, 6 joined later on and 1 changed from the online to the offline mode. So altogether there are currently 21 offliners actively participating in the project, out of which 16 already submitted 6 or more periodic measurements.

Even though offliners in general are more loyal concerning the participation in e2democracy, regarding savings, onliners are more successful in their efforts to reduce CO_2 and energy waste respectively seem to undergo greater efforts in this regard. Considering the individual CO_2-balances of the panellists, 70% of onliners improved their balance while only 44% of the offliners reduced their CO_2-emissions.

Would the results have been the same without citizen participation?

The monitoring of consumption data for the calculation of CO_2-emission was chosen for the e2democracy project because of the assumption that CO_2-balances and energy consumption can be measured in rather concrete figures. However, this assumption was not only challenging with regard to the calculation of CO_2-balances but also with regard to the

provision of control data in order to assess whether the results would have been the same without citizen participation.

In e2democracy, control data is planned to be provided by the local energy suppliers. As for heating there are a variety of energy forms employed at the panellists' households ranging from wood pellets, to district heating, to oil and gas, the provision of control data showing the development of the general consumption in the local community is complex to impossible. Moreover, to provide for control data for a small subgroup of panellists is rather useless as the explanatory power would be minimal. The option of measuring gas consumption is currently tested. This is the most widely used heating source by panellists. Moreover, compared to wood and oil heating, gas consumption is generally measured by accurate meters.

The other source for control data is the consumption data for electricity as provided by the local electricity supplier. Even though electricity is measured by meters in every household, the local supplier in Bremen does not have concrete consumption data for the average citizen. The database at the local supplier is organized based on supply-contracts and not on households. But one supply contract can include several households, e.g. for the self inhabited apartment, the commonly used electricity with other households, the garden house, etc. Furthermore, the household size is not known by the electricity provider. Another problem is the availability of up-to-date consumption data of customers. Due to the fact that bills are furnished only once a year and because of the fluctuation of customers with the possibility to sign and cancel contracts at any time of the year, final consumption data can only be collected one year after the annual account of the previous year. On the one hand this means that there is no valid data for the average citizen available and on the other, the available data can't be determined on an up-to-date basis. In the near future, as promised by the electricity supplier, valuable estimations on monthly basis shall be available. So far, no statements whether the results would have been the same without citizen participation are possible.