



# D4.1.2

## ANALYSIS REPORT PER PIONEER CITY WITH SURVEY RESULTS: *PAMPLONA*

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Author	Jose Costero
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# 1 – DESCRIPTION OF THE EVALUATION TOOL(S) USED

## Name of the tool

The tool used in Pamplona for the evaluation of the participants in the local campaign has been adapted by the local ENGAGE team from a calculator developed for the European project E2democracy by CIRCE Foundation in collaboration with the company ULYSEA S.A.

This tool for calculating CO<sub>2</sub> emissions aimed to provide support for the European research project E2democracy. This project examined the procedures for public participation in terms of its impact on political decisions and behaviour change on the part of citizens. To achieve these aims, the project E2democracy investigated the impact of online citizen participation compared with the traditional offline through citizen surveys to assess the evolution of CO<sub>2</sub> emissions over a period of two years. The verification was conducted online and offline through regular data capture through a CO<sub>2</sub> calculator developed in this project. Partners of E2democracy were German, Austrian and Spanish (the Research Group Accounting, Auditing and Public Sector Management at the University of Zaragoza). The cities involved in the project were Bremen, Mariazell, Bregenz, Zaragoza and Pamplona.

The calculation tool consists of 8 parts:

1. People: it asks for the number of people living in the house since the heat and power consumption are divided by that number.
2. Heating and hot water consumption data (m<sup>3</sup>, kWh or bottles).
3. Electricity consumption data (kWh).
4. Private vehicles: vehicle type (small, medium, large), fuel (gasoline or diesel), distance (km) and number of people travelling on average.
5. Public transport media type (bus, train, etc.) and distance (km).
6. Air traffic: type of flight (domestic, European, intercontinental), class (tourist or business) and distance (km).
7. Nutrition information is requested on physiological data and occupation of persons and nutrition habits.
8. Consumption in general: it asks for details on purchasing behaviour to calculate indirect emissions

ENGAGE Pamplona team departed this basis and adjusted emission factors taking into account the reality of the region. The biggest change was in the emission factor for electricity, to account for the large percentage of total electricity production with renewable energy in Navarra. In reality, this does not affect the tool, since it serves to make a comparison between two years. Thus, changing the calculation method was not necessary to make it more accurate, since what matters are increases and reductions, not absolute values.



## Information required

Categories covered	Indicator	Unit	Measured or estimates	Primary or Final consumption	Conversion factor used and source if final consumption	Comment
Heating	Annual consumption	m <sup>3</sup> , kWh or bottles	Measured	Final	Emission factors have been used to convert final energy units into CO <sub>2</sub> eq emissions.  The sources were: Ministry for Environment, IDAE, IFEU, Ecology and Development Foundation, European Environmental Agency and Klimactiv.	
Hot water	Annual consumption	m <sup>3</sup> , kWh or bottles	Measured	Final		
Cold water	Annual consumption	m <sup>3</sup>	Measured	Final		
Private transport	Distance covered by type of car and fuel	km	Measured or estimated	Final		
Public transport	Distance covered by type of transport	km	Measured or estimated	Final		
Nutricion	Feed profile, weight, age, activity...	Various	Estimated	Final		
Goods consumption	Consumption profile, nights at hotel...	Various	Estimated	Final		

### Target Group: stakeholders, citizens or public servants/elected representatives

The target group of this tool are citizens, though, has been used to evaluate stakeholders and public employees, using only part of the tool (transportation, heating, electricity ...).

### Free/Licence required

Free, no licence required.

### Developer(s)

Pamplona City Council selected the tool developed for the European project E2democracy by CIRCE Foundation in collaboration with the company ULYSEA S.A.

Despite seeking a simpler tool and available to all citizens, we did not find any that could be applied in Navarra. In other regions, such as Andalusia there are such calculators available to the public through the website.

### Comments (advantages/ disadvantages of the tool)

Pamplona City Council selected this tool because of the following advantages:

- It was previously known as collaborating on the project E2democracy.



- It calculates emissions based on real data.
- It calculates emissions in tCO<sub>2</sub> equivalents.
- It takes into account the emissions associated with the production and transportation of energy, not just consumption.
- It quantifies emissions from all aspects of life of citizens, enabling more accurately assess changes in habits.

Finally, we recommend using this tool if you want to get an accurate picture of emissions of citizens. However, we believe that a tool is somewhat complex and requires much effort and time, so we recommend other cities to use other tools for their local campaigns. Furthermore, the amount of information needed by citizens makes it very difficult for them to get involved in these evaluations of their engagements.

## 2 – MONITORING METHODOLOGY AND STRATEGY FOR ENGAGE

### 2.1 – MONITORING METHOD

The evaluation method of the citizens was as follows:

First we had email contact with citizens telling their volunteer status for evaluation and they were asked to send all the necessary information. To this end, we developed an Excel sheet survey type they had to fill in with some data: number of people living at home, data on travel in private vehicles and public transport nutrition, exercise, consumption, etc.. In addition, we requested copies of invoices of their consumption of electricity, gas, etc., or they could facilitate the data of average monthly consumption, which is indicated in the invoices.

With the average monthly energy consumption of the past 12 months and the survey data, the Pamplona ENGAGE team filled in the CO<sub>2</sub> calculator and got the result for every citizen. Then we would send an email with their emission data indicating those aspects of their life that could be improved to reduce their emissions.

In many cases it was not enough with sending an email. In that case, if no response was obtained we send again a second email. If no response was obtained they were called directly by phone, if we had it. It should be noted that many of the participants did not provide the phone number because they prefer to participate via email, as it is a more impersonal media.

A year later, we remind again participants about their first assessment and we request them data for the second assessment. In this case the contact is also made by email and a copy of the first Excel sheet was provided so that they had filled for reference.

With the received data we calculated the second evaluation. Then we sent an email with the results to the participants and whether this had increased its emissions or not, in what areas and why.

For stakeholder evaluation the method has been customized in each case. Therefore, we describe a case by case how the evaluation was conducted:

Volkswagen Navarra: the commitment of this car factory was sending more vehicles by rail and less by road (truck), as emissions and the cost of rail are much lower. Pamplona ENGAGE team seemed a very good compromise for evaluation, since it would be easily quantifiable. So, we got in touch with the management of the company and we commented that we wanted to assess their commitment. The response was very positive, as they themselves through their environmental responsibility strategy "Think Blue" had already begun to evaluate this measure. So, in summer 2011 we were provided data of cars in 2010 were transported to the port of Santander by road and rail and associated emissions. A year later, in summer 2012 we were provided the same data for 2011. The



emission reduction calculation was made by the company and collated by the Pamplona ENGAGE team.

Thomson Reuters Aranzadi: in this case they were committed "to use efficiently the energy resources", so we set out to evaluate emissions from its headquarters in Pamplona, a large office building. Thus, in October 2011 we provided the data of electrical and heating consumption. A year later, they send their consumption for comparison. In this case, the consumption data were entered into the same tool used for citizens to turn them into CO<sub>2</sub> emissions.

Industry Association of Navarra (AIN): they were "committed to make an energy audit and design an energy savings plan" at its headquarters, a large office building. Pamplona ENGAGE team seemed a good idea to assess the impact on emissions of this AIN commitment. So, months after making his commitment they had already developed an energy audit and savings plan. The plan outlined a series of measures to carry out indicating the cost, energy savings, CO<sub>2</sub> emissions savings, and the return period of each. The idea was to test a year later which of these measures have been implemented. Thus, with the data of the savings plan we could know the emissions savings of all actions taken. However, when a year later we contacted them they told us that they had not taken any measure, so we had to evaluate them with no reduction of CO<sub>2</sub> emissions, so the same amount as the previous year, as they had not implemented any saving measure.

UNICEF Committee Navarre: they were committed "to address the issue of climate change in the next Week for Children in Navarre". Each year, UNICEF Navarre Committee organizes a week of activities for schools attended by about 500 students. Their commitment was to include the issue of climate change, how it affects people in poor countries and, especially, children and what we can do to avoid it in our daily lives. Thus, about 500 children in November 2011 participated in this activity. To assess this commitment Pamplona ENGAGE team was based on estimates made by an outside company hired to prepare the Sustainable Energy Action Plan of Pamplona, whereby participants in awareness campaigns on energy saving results in a reduction of emissions by 10%. Thus, we applied the estimated emission reduction of 10% for those 500 students, considering that their emissions are average for a city of Pamplona (5.5 tCO<sub>2</sub>eq/hab).

Triman Navarra: the commitment of this football team, playing in the first national division, was "carpooling to attend trainings". Although trains and plays in the city of Pamplona, this team is originally from the town Irurtzun, located about 25 km from the capital of Navarre. Still, many of the team's players were born in Irurtzun and live there with their families. So, in summer 2012 the Manager was requested data team players who share their vehicles to go to training: number of players per car, number of cars, number of training sessions per week, number of weeks in a season, etc. And we calculated CO<sub>2</sub> emissions associated with these movements. Then the result was compared with the emissions that would have occurred if each player had been in his own car.

For public employees' commitments evaluation method has also varied depending on the commitment:

Pamplona Mayor's commitment: "I pledge to reduce energy consumption in municipal buildings by 10% by 2015". Real data has been taken for about 90 municipal buildings electricity consumption, gas and diesel between May 2010 and May 2011 and between May 2011 and May 2012. To calculate CO<sub>2</sub> emissions we have used the same calculator that was used for citizens.

Commitment of Environmental Education Museum: "We commit to promote environmental education". In this case the method of evaluation is the same as the UNICEF Committee of Navarre. To do this, we have compared the data of participants in activities on energy and climate change between July 2010 and June 2011 with the same period in 2011 and 2012. As the Museum for Environmental Education and worked in that field, what is evaluated is the increased activity in the area of energy and climate change.



Commitment of Sustainability Services: "We are committed to promoting sustainable energy in Pamplona". This commitment has been evaluated through various programs conducted by Sustainability Services with real data, comparing results from 2010 and 2011: workshops on energy in schools (number of students participating), car sharing service (number of cars shared trips and distance traveled), Efficient Schools program (number of participants), efficient driving courses (number of participants), E2democracy project (number of participants) and the advising service (number of users). Also it has been evaluated in terms of production of renewable energy facilities of the City Council, comparing 2010 with 2011.

Carsharing Service Commitment: "We commit to promote Electric Carsharing service in Pamplona". To assess this commitment we have used data service usage during the months of July to September 2012. With accumulative distance we have calculated differences in emissions if those trips had been made in conventional vehicles. The service was launched in June 2012, so there is no previous data.

Nbici Service Commitment (public bicycle rental service): "We are committed to promoting the use of the service Nbici in Pamplona". In this case, we have compared the data service usage in 2010 with the same data in 2011. It has been estimated emission reductions from the distance, taken as reference emissions of a car that travels the same distance.

Service Commitment 010 (local call service and carrying out procedures): "Call 010 and saves unnecessary trips". We have compared the number of citizens served in 2010 with those treated in 2011. It has been estimated that it would emit users to follow the same procedures in person considering the modal split in Pamplona.

Commitment bicycle users municipal employees: A survey was performed to compare the users use the same travel emissions if carried in a car.

Communication Service Commitment: "We pledge to go to work on foot or by bicycle." Emissions are estimated to produce if they were in the same car for distance traveled in a year.

Commitment of former Mayor: "I engage to promote universal accessibility in Pamplona". We have evaluated the short term measures of our SEAP related to accessibility already implemented (public elevators, streets redevelopments... As the SEAP indicates the amount of emissions expected to save with each measure we have assume this data

Commitment of the City Council: "We engage to promote sustainability in the city". As the main engagement of the City Council in this field is the SEAP of Pamplona, to evaluate this engagement we have checked all the short term SEAP measures already implemented. As the SEAP indicates the amount of emissions expected to save with each measure we have assume this data. We haven't count measures related with other engagements to avoid double counting.

<b>Category of participants</b>	<b>Number of participants</b>	<b>Date of 1<sup>st</sup> evaluation</b>	<b>Date of 2<sup>nd</sup> evaluation</b>	<b>Method: estimation or real data</b>
<i>Citizens- group1</i>	15	07/10/11	07/23/12	<i>Real data</i>
Citizens	62	March-November 2011	March-November 2012	Real data and estimation
Stakeholders	5	March-November 2011	March-November 2012	Real data and estimation
Public servants	10	March-November 2011	March-November 2012	Real data and estimation



## 2.2 – MONITORING STRATEGY

The evaluation strategy of citizens has been the following:

To join the campaign and make their own commitment to climate change, citizens must first fill out a form containing four blocks:

- The first block was purely informative and described the campaign and the purpose of it.
- In the second block personal data (name, date of birth ...), contact information (phone, address, email ...) and the compromise text were collected.
- The third block contained legal notices and authorizations for the use of the image, personal data and the text of the commitment under the ENGAGE campaign.
- The fourth block contained a specific section on evaluation.

To participate in the campaign was obliged to complete and sign the second and third block: personal data, contacts, commitment text and authorizations. The fourth block was voluntary and should be signed only if the person was interested in being evaluated. All this was explained personally to interested citizens in the various events organized as part of the local campaign: World Environmental Day (4/6/2011), San Fermin Festivals (11/7/2011), ENGAGE Day (1/10/2011) and World Environmental Day (5/6/2012).

Thus, we began to contact the citizens who had signed the fourth block of the form. However, even though more than 30% of citizens signed this block, to contact them almost none reached the first evaluation, and did not send their data. The few who did were colleagues, family or friends of Pamplona ENGAGE team staff. Specifically only 13 baseline evaluations were performed in this step.

Given this low success rate we decided to change strategy. In this second phase we explored two ways: the E2democracy project and personal contacts.

Within the E2democracy project a meeting was organized in Pamplona in November 2012 to present the results of the first year of monitoring volunteers emissions. At that meeting, was presented ENGAGE campaign and asked the audience to participate in it with the same commitment as they had done with the project E2democracy, so that finally 13 participants decided to take a picture under the text: "Through our E2democracy participation in the project are committed to reducing our emissions." Of these 13 people 9 agreed to authorize the University of Zaragoza to provide data to the City of Pamplona for evaluation under the ENGAGE project.

The second way on this new search strategy was direct participants searching through personal contacts with colleagues, family and friends. Thus, the contact was much more personal and explanations about the project and its goal ENGAGE were more detailed and personalized. Also we identified and recruit people who were also really interested in being evaluated.

Through this double way we could reach the goal of citizens baseline evaluations (50), performing a total of 62.

A year later we re-contacted participants for the second evaluation. Of the 62, 52 participants performed the second evaluation.

Finally, these 52 participants were sent information on their emissions and their evolution over the previous year.

The evaluation strategy of stakeholders was as follows:



Before launching the campaign for the general public, Pamplona ENGAGE team looked for recruiting stakeholders and celebrities. In this way, we managed to recruit 38 stakeholders before the launch of the campaign, on the 1st of June 2011. Among these stakeholders were selected five commitments that were more likely to be assessed and also represented a variety of stakeholders and commitments: the Volkswagen factory in Navarre, the Industry Association of Navarra, the company Thomson Reuters Aranzadi, the UNICEF NGO Committee Navarra and futsal team Trimán Navarra. All were contacted and agreed to participate in the evaluation for the ENGAGE project.

The evaluation strategy of public servants was as follows:

The diversity of participants and commitments Pamplona City Council and public employees under the ENGAGE campaign has been very diverse: from the Mayor pledging to save energy in public buildings, to the Environmental Education Museum pledging to promote environmental awareness, to committing employees to use bicycles as a means of transport. As a consequence the evaluation thereof was very diverse.

In this case, the strategy was not very important, since when municipal commitments, in most cases we already have the information needed to evaluate. In this case, the main issue was the evaluation methodology that had to be adapted to each specific case.

<b>Category of participants</b>	<b>Strategy to get the users to supply the data</b>	<b>Staff capacity required</b>	<b>Resources</b>	<b>Cost of the event</b>
Citizens	3 photo shootings	5 people: 1 photographer, 4 advisors.	1 stand, 1 roll up, flyers, forms, posters, engagements ideas...	1.500 € / event
Citizens	1 ENGAGE Day	5 people: 1 photographer, 4 advisors.	1 stand, 1 roll up, flyers, forms, posters, engagements ideas...	1.500 € / event



### 3 – POSTER RESULTS

Figure	Citizens	Stakeholders	Public Servants	Total (All categories)
Number of posters produced	377	48	23	448
Number of people ENGAGEd	509	410	124	1043
Project targets: number of people ENGAGEd	250	25	20	295
Number of baselines done before the end of October 2011	62	5 organisations* representing 116 ENGAGEd stakeholders	10 entities** representing 23 ENGAGEd public servants	77/201
Number of complete evaluations carried out	52	5 organisations* representing 116 ENGAGEd stakeholders	10 entities** representing 23 ENGAGEd public servants	67/191
Project evaluations targets	50	5	10	65

\* Organisations: private companies, firms, associations or NGOs

\*\* Entities: the local authority or its individual departments, public institutions (such as libraries, schools, etc.)



## 4 – EVALUATION RESULTS

Figure	Citizens	Stakeholders	Public servants	Total (All categories)
Amount of CO <sub>2</sub> saved (in tonnes of CO <sub>2</sub> equivalents/year)	29,946	521,669	3,004.832	3,556.447
Amount of RES produced (in KWh/year)			55,131	

### Justification if you are not able to present energy savings and/or renewable energy produced results:

Our choice in Pamplona ENGAGE team was to evaluate the CO<sub>2</sub> equivalent emissions reductions as we think it has two advantages compared with energy saved:

- The CO<sub>2</sub> equivalent emissions are directly linked to climate change, meanwhile the energy consumption is not, it depends in the source of this energy.
- There are some aspects of life that have a strong impact in CO<sub>2</sub> emissions but they do not in energy consumption, such as: waste treatment, agriculture, farming, change of land use...

### 4.1 – MONITORING

Figure	Citizens	Stakeholders	Public servants	Total (All categories)
Number of people who did a baseline	62	5/116	10/23	77/201
Number of people, organisations and entities who did the second evaluation	<b>52</b>	5/116	10/23	67/191
Percentage of people, organisations and entities who completed the evaluation process (= who did the 2 evaluations)	<b>84 %</b>	100 %	100 %	87 %

### 4.2 – EXTRAPOLATION FOR THE WHOLE POPULATION

**Pamplona population: 198,000 inhab.**

- CO<sub>2</sub> saved (please indicate the unit): 198,000 inhab. X 0.576 tCO<sub>2</sub>eq/person = **114,048 tCO<sub>2</sub>eq**



#### 4.3 – INTERESTING STATISTICS:

Figure	Citizens	Stakeholders	Public servants	Total (All categories)
% of the monitored population that reduced their CO <sub>2</sub> emissions	65	80	100	72
% of monitored population that increased their CO <sub>2</sub> emissions	35	0	0	27
% of the monitored population achieving to produce RES:			10	
<b>Average individual % of CO<sub>2</sub> emissions avoided</b>	<b>7%</b>	N/A	N/A	-
Figure of the most important CO <sub>2</sub> /energy saving measure	Almost 10 tonnes 9976 kg	408 tonnes	1 421 tonnes	

## 5 – RECOMMENDATIONS AND LESSONS LEARNT

### 3 lessons learnt

**1- Difficulty in collecting data.** The main lesson we have learned in Pamplona is the difficulty of obtaining data on consumption and behaviour of citizens. To get them the citizen has to spend some time reviewing his/her bills, to point mileage, thinking about the travel history, etc.. This represents a considerable effort for most of the citizens who do not do this systematically. Some people are unable to locate their energy consumption bills, since the main concern is to pay and once they have paid do not keep the receipt. Our recommendation in relation to this lesson would be to keep things simple. Reality is too complicated and collecting data is so boring, so sometimes it is better to evaluate making estimations. This lesson is related to the two other following lessons we have learned.

**2.- Citizens are not concerned about their energy consumption.** The first is that there is still little concern among citizens concerning their energy consumption. Most citizens do not control if they spend more or less power, simply if they pay more or less. Moreover, they do not know from what they pay how much is due to consumption really. Our recommendation is to link the energy savings with the money saved, because citizens are more willing to save energy by the economic aspect rather than doing it for the environmental aspect.

**3.- Difficulty in evaluating people.** The second is that many people say they are willing to be evaluated, but then do not provide their data. In Pamplona about 40 % of participants signed to be evaluated but finally very few of them sent their data. We believe that this is due to the significant effort required to collect this information., Our recommendation is looking for collaboration from the energy supplier companies, because they know the actual energy consumption and they can give the data if they are authorized by the customer. For other data (transport, nutrition...) it is probably a better choice to model or estimate their emissions, based on a survey or other indicators.



## 6 – APPENDICES

We show in the following table the results for each one of the citizens evaluated in the baseline evaluation: (unit: tCO<sub>2</sub>eq)

Citizen number	Heating and hot water	Cold water	Electricity	Private transport	Public transport	Flights	Nutrition	Consumption of goods	Total
1	0,36	0,00	0,26	1,95	0,16	0,46	0,69	1,78	<b>5,66</b>
2	0,59	0,00	0,17	0,82	0,00	0,00	1,02	1,23	<b>3,83</b>
3	2,39	0,00	0,17	3,96	0,00	0,00	0,89	1,17	<b>8,58</b>
4	0,48	0,00	0,37	1,26	0,33	0,00	1,06	1,23	<b>4,73</b>
5	1,44	0,00	0,84	0,19	0,00	0,00	0,52	1,23	<b>4,23</b>
6	0,42	0,00	0,16	1,65	0,49	19,26	1,77	1,30	<b>25,04</b>
7	0,59	0,00	0,40	1,46	0,07	8,67	1,67	1,37	<b>14,22</b>
8	0,50	0,00	0,44	1,46	0,10	6,60	0,69	1,78	<b>11,57</b>
9	0,50	0,00	0,44	1,46	0,10	6,60	0,91	1,78	<b>11,79</b>
10	0,36	0,00	0,22	0,44	0,02	0,00	0,98	1,17	<b>3,18</b>
11	0,50	0,00	0,44	2,20	0,13	0,31	0,98	1,23	<b>5,79</b>
12	0,42	0,00	0,16	0,92	0,21	2,02	1,18	1,23	<b>6,14</b>
13	0,36	0,00	0,26	0,42	0,46	0,95	0,81	1,37	<b>4,63</b>
14	1,36	0,00	0,28	3,88	0,09	0,00	1,21	1,23	<b>8,06</b>
15	0,36	0,00	0,26	1,32	0,01	0,00	0,71	1,23	<b>3,90</b>
16	0,42	0,00	0,16	3,96	0,16	5,56	1,33	1,37	<b>12,96</b>
17	0,73	0,00	0,18	2,33	0,10	2,29	0,55	1,37	<b>7,54</b>
18	0,48	0,00	0,21	1,83	0,13	0,00	0,40	1,30	<b>4,35</b>
19	0,14	0,00	0,17	8,80	0,02	0,00	1,62	1,78	<b>12,53</b>
20	0,29	0,00	0,08	7,17	0,25	0,00	0,59	1,23	<b>9,62</b>
21	0,59	0,00	0,20	0,40	0,12	0,00	0,76	1,23	<b>3,30</b>
22	1,44	0,00	0,21	0,84	0,00	0,93	0,83	1,37	<b>5,63</b>
23	0,72	0,00	0,23	0,70	0,12	0,38	1,66	1,23	<b>5,04</b>
24	0,44	0,00	0,24	2,51	0,02	0,25	1,08	1,23	<b>5,77</b>
25	0,73	0,00	0,18	2,33	0,10	2,29	0,81	1,37	<b>7,81</b>
26	0,59	0,00	0,19	0,28	0,05	0,00	0,68	1,23	<b>3,01</b>
27	0,14	0,00	0,17	0,09	0,00	0,00	0,21	1,17	<b>1,79</b>
28	0,71	0,00	0,18	0,00	0,00	0,00	0,08	1,23	<b>2,20</b>
29	0,73	0,00	0,18	1,42	0,10	2,29	0,12	1,37	<b>6,20</b>
30	0,71	0,00	0,18	4,89	0,26	0,00	0,98	1,23	<b>8,24</b>
31	0,60	0,00	0,27	1,87	0,08	0,00	0,95	1,30	<b>5,06</b>
32	1,71	0,00	0,28	1,76	0,23	1,78	1,16	1,23	<b>8,16</b>
33	0,65	0,00	0,15	6,60	0,00	0,78	0,96	1,23	<b>10,38</b>
34	1,56	0,00	0,20	0,28	0,40	1,02	1,25	1,23	<b>5,65</b>
35	0,65	0,00	0,15	6,60	0,00	0,78	0,25	1,29	<b>9,73</b>
36	1,39	0,00	0,58	1,32	0,05	0,00	0,63	1,23	<b>5,20</b>
37	1,71	0,00	0,28	1,76	0,23	1,78	0,79	1,23	<b>7,79</b>



38	0,65	0,00	0,13	8,80	0,00	0,78	1,41	1,23	<b>13,02</b>
39	0,72	0,00	0,23	0,08	0,12	0,38	0,45	1,23	<b>3,22</b>
40	0,71	0,00	0,18	1,08	0,28	0,00	0,82	1,29	<b>4,35</b>
41	0,36	0,00	0,24	0,44	0,00	0,00	0,75	1,17	<b>2,96</b>
42	0,51	0,00	0,18	0,20	0,05	0,29	1,13	1,17	<b>3,53</b>
43	0,49	0,00	0,22	0,29	0,03	0,00	0,63	1,32	<b>2,99</b>
44	0,33	0,00	0,15	0,66	0,00	13,08	0,97	1,35	<b>16,53</b>
45	0,25	0,00	0,10	0,00	0,02	0,00	0,83	1,17	<b>2,37</b>
46	0,72	0,00	0,26	0,36	0,17	0,00	0,86	1,26	<b>3,64</b>
47	0,39	0,00	0,18	0,02	0,63	0,00	0,62	1,26	<b>3,10</b>
48	0,82	0,00	0,13	0,89	1,62	1,64	0,62	1,29	<b>7,01</b>
49	0,72	0,00	0,26	0,41	0,16	0,00	1,14	1,26	<b>3,96</b>
50	0,33	0,00	0,18	0,00	0,28	1,37	1,15	1,32	<b>4,63</b>
51	0,94	0,00	0,23	0,37	0,34	1,31	0,70	1,26	<b>5,14</b>
52	0,47	0,00	0,23	2,20	0,01	0,00	1,35	1,23	<b>5,49</b>
<b>TOTAL</b>	<b>36,14</b>	<b>0,03</b>	<b>12,43</b>	<b>96,90</b>	<b>8,29</b>	<b>83,86</b>	<b>46,21</b>	<b>67,66</b>	<b>351,24</b>
Average	0,70	0,00	0,24	1,86	0,16	1,61	0,89	1,30	<b>6,75</b>

Second evaluation results: (unit: tCO<sub>2</sub>eq)

Citizen number	Heating and hot water	Cold water	Electricity	Private transport	Public transport	Flights	Nutrition	Consumption of goods	Total
1	0,36	0,00	0,26	1,05	0,01	0,00	0,77	1,23	<b>3,69</b>
2	0,78	0,00	0,21	1,17	0,01	0,00	0,97	1,23	<b>4,37</b>
3	2,25	0,00	0,16	3,96	0,00	0,00	0,75	1,30	<b>8,43</b>
4	0,48	0,00	0,30	1,08	0,30	0,00	1,05	1,23	<b>4,45</b>
5	1,44	0,00	0,58	0,17	0,00	0,00	0,52	1,23	<b>3,94</b>
6	0,42	0,00	0,09	1,65	0,49	19,26	1,64	1,30	<b>24,85</b>
7	0,55	0,00	0,44	0,87	0,12	8,63	1,23	1,78	<b>13,62</b>
8	0,61	0,00	0,42	1,16	0,11	7,85	0,59	1,78	<b>12,52</b>
9	0,61	0,00	0,42	1,16	0,11	7,85	0,83	1,78	<b>12,76</b>
10	0,36	0,00	0,21	1,00	0,23	1,18	1,08	1,30	<b>5,36</b>
11	0,61	0,00	0,42	2,09	0,10	0,00	0,98	1,23	<b>5,43</b>
12	0,42	0,00	0,09	0,92	0,21	2,02	1,18	1,23	<b>6,07</b>
13	0,36	0,00	0,26	1,46	0,21	0,00	0,68	1,37	<b>4,34</b>
14	0,76	0,00	0,20	3,30	0,07	0,00	1,15	1,17	<b>6,65</b>
15	0,36	0,00	0,26	2,20	0,01	0,00	0,71	1,23	<b>4,77</b>
16	0,42	0,00	0,09	3,96	0,16	5,56	1,33	1,37	<b>12,89</b>
17	0,51	0,00	0,12	2,06	0,01	2,35	0,51	1,23	<b>6,80</b>
18	0,48	0,00	0,18	1,32	0,02	0,29	0,36	1,69	<b>4,34</b>
19	0,45	0,00	0,11	6,16	0,01	0,00	1,62	1,78	<b>10,13</b>
20	0,29	0,00	0,09	1,19	0,17	0,00	0,59	1,37	<b>3,70</b>
21	2,18	0,00	0,28	0,42	0,00	0,00	0,76	1,23	<b>4,87</b>
22	1,44	0,00	0,26	1,03	0,00	0,00	0,79	1,37	<b>4,90</b>



23	0,72	0,00	0,22	1,14	0,20	0,00	1,56	1,17	<b>5,02</b>
24	0,31	0,00	0,24	2,51	0,02	0,25	1,08	1,23	<b>5,65</b>
25	0,51	0,00	0,12	1,74	0,01	2,35	0,72	1,23	<b>6,69</b>
26	0,78	0,00	0,21	0,28	0,00	0,00	0,79	1,23	<b>3,29</b>
27	0,45	0,00	0,11	0,09	0,04	0,00	0,25	1,17	<b>2,13</b>
28	0,64	0,00	0,14	0,00	0,12	0,00	0,19	1,17	<b>2,27</b>
29	0,51	0,00	0,12	1,30	0,00	0,00	0,14	1,23	<b>3,30</b>
30	0,64	0,00	0,14	4,30	0,12	0,85	0,93	1,17	<b>8,16</b>
31	0,44	0,00	0,31	1,10	0,01	0,00	0,99	1,17	<b>4,03</b>
32	0,72	0,00	0,21	1,76	0,13	0,78	1,16	1,23	<b>6,00</b>
33	0,69	0,00	0,13	5,79	0,01	0,13	0,90	1,23	<b>8,89</b>
34	0,67	0,00	0,30	0,28	0,37	1,02	1,30	1,23	<b>4,89</b>
35	0,69	0,00	0,13	5,79	0,01	0,13	0,22	1,29	<b>8,26</b>
36	0,98	0,00	0,59	2,89	0,05	0,00	0,69	1,23	<b>6,44</b>
37	0,72	0,00	0,21	1,76	0,13	0,78	0,79	1,23	<b>5,63</b>
38	0,69	0,00	0,15	8,36	0,01	0,13	1,32	1,23	<b>11,89</b>
39	0,72	0,00	0,22	0,08	0,20	0,00	0,43	1,11	<b>2,76</b>
40	0,64	0,00	0,14	0,96	0,18	0,85	0,64	1,23	<b>4,64</b>
41	0,36	0,00	0,26	0,39	0,00	0,00	0,75	1,17	<b>2,93</b>
42	0,42	0,00	0,17	0,62	0,08	0,00	1,12	1,17	<b>3,59</b>
43	0,56	0,00	0,24	0,56	0,03	0,00	0,63	1,23	<b>3,24</b>
44	0,51	0,00	0,24	0,08	0,05	3,27	0,98	1,42	<b>6,55</b>
45	0,28	0,00	0,11	0,00	0,02	0,26	0,83	1,17	<b>2,66</b>
46	0,72	0,00	0,25	0,40	0,16	0,00	0,86	1,26	<b>3,66</b>
47	0,49	0,00	0,11	0,10	0,79	0,00	0,62	1,35	<b>3,47</b>
48	0,86	0,00	0,20	1,52	0,66	0,76	0,60	1,41	<b>6,00</b>
49	0,72	0,00	0,25	0,48	0,00	0,00	1,14	1,26	<b>3,85</b>
50	0,12	0,00	0,22	0,00	0,37	2,81	1,14	1,39	<b>6,05</b>
51	0,97	0,00	0,24	1,33	0,11	0,90	0,70	1,17	<b>5,43</b>
52	0,43	0,00	0,20	1,76	0,01	0,00	1,35	1,23	<b>4,98</b>
TOTAL	34,13	0,03	11,60	86,75	6,23	70,24	44,97	67,51	321,19
Average	0,66	0,00	0,22	1,67	0,12	1,35	0,86	1,30	6,18

Emission reductions= second evaluation – baseline evaluation (unit: tCO<sub>2</sub>eq)

Citizen number	Heating and hot water	Cold water	Electricity	Private transport	Public transport	Flights	Nutrition	Consumption of goods	Total
1	0,00	0,00	0,00	-0,89	-0,14	-0,46	0,08	-0,55	<b>-1,97</b>
2	0,20	0,00	0,03	0,35	0,01	0,00	-0,05	0,00	<b>0,54</b>
3	-0,13	0,00	-0,01	0,00	0,00	0,00	-0,14	0,13	<b>-0,16</b>
4	0,00	0,00	-0,06	-0,18	-0,03	0,00	-0,01	0,00	<b>-0,29</b>
5	0,00	0,00	-0,27	-0,02	0,00	0,00	0,00	0,00	<b>-0,29</b>
6	0,00	0,00	-0,07	0,00	0,00	0,00	-0,12	0,00	<b>-0,19</b>
7	-0,04	0,00	0,04	-0,58	0,05	-0,04	-0,44	0,41	<b>-0,61</b>



8	0,10	0,00	-0,02	-0,29	0,01	1,25	-0,10	0,00	<b>0,95</b>
9	0,10	0,00	-0,02	-0,29	0,01	1,25	-0,09	0,00	<b>0,96</b>
10	0,00	0,00	0,00	0,55	0,22	1,18	0,10	0,13	<b>2,18</b>
11	0,10	0,00	-0,02	-0,11	-0,03	-0,31	0,00	0,00	<b>-0,36</b>
12	0,00	0,00	-0,07	0,00	0,00	0,00	0,00	0,00	<b>-0,07</b>
13	0,00	0,00	0,00	1,04	-0,25	-0,95	-0,13	0,00	<b>-0,29</b>
14	-0,60	0,00	-0,09	-0,58	-0,02	0,00	-0,06	-0,06	<b>-1,41</b>
15	0,00	0,00	0,00	0,88	0,00	0,00	0,00	0,00	<b>0,88</b>
16	0,00	0,00	-0,07	0,00	0,00	0,00	0,00	0,00	<b>-0,07</b>
17	-0,21	0,00	-0,06	-0,27	-0,09	0,07	-0,04	-0,14	<b>-0,74</b>
18	0,00	0,00	-0,03	-0,50	-0,12	0,29	-0,04	0,39	<b>-0,01</b>
19	0,30	0,00	-0,05	-2,64	-0,01	0,00	0,00	0,00	<b>-2,39</b>
20	0,00	0,00	0,01	-5,98	-0,08	0,00	0,00	0,14	<b>-5,92</b>
21	1,59	0,00	0,08	0,01	-0,12	0,00	0,00	0,00	<b>1,57</b>
22	0,00	0,00	0,05	0,20	0,00	-0,93	-0,04	0,00	<b>-0,73</b>
23	0,00	0,00	-0,01	0,45	0,08	-0,38	-0,09	-0,06	<b>-0,02</b>
24	-0,12	0,00	0,00	0,00	0,00	0,00	0,00	0,00	<b>-0,12</b>
25	-0,21	0,00	-0,06	-0,59	-0,09	0,07	-0,09	-0,14	<b>-1,12</b>
26	0,20	0,00	0,02	0,00	-0,05	0,00	0,11	0,00	<b>0,28</b>
27	0,30	0,00	-0,05	0,00	0,04	0,00	0,04	0,00	<b>0,34</b>
28	-0,06	0,00	-0,04	0,00	0,12	0,00	0,12	-0,06	<b>0,07</b>
29	-0,21	0,00	-0,06	-0,12	-0,10	-2,29	0,03	-0,14	<b>-2,90</b>
30	-0,06	0,00	-0,04	-0,59	-0,14	0,85	-0,04	-0,06	<b>-0,09</b>
31	-0,16	0,00	0,04	-0,77	-0,06	0,00	0,05	-0,13	<b>-1,03</b>
32	-0,99	0,00	-0,07	0,00	-0,10	-1,00	0,00	0,00	<b>-2,16</b>
33	0,04	0,00	-0,02	-0,81	0,00	-0,66	-0,06	0,00	<b>-1,50</b>
34	-0,89	0,00	0,10	0,00	-0,02	0,00	0,05	0,00	<b>-0,76</b>
35	0,04	0,00	-0,02	-0,81	0,01	-0,66	-0,03	0,00	<b>-1,47</b>
36	-0,41	0,00	0,01	1,58	0,00	0,00	0,06	0,00	<b>1,24</b>
37	-0,99	0,00	-0,07	0,00	-0,10	-1,00	0,00	0,00	<b>-2,16</b>
38	0,04	0,00	0,02	-0,44	0,00	-0,66	-0,09	0,00	<b>-1,13</b>
39	0,00	0,00	-0,01	-0,01	0,08	-0,38	-0,02	-0,12	<b>-0,46</b>
40	-0,06	0,00	-0,04	-0,12	-0,10	0,85	-0,18	-0,06	<b>0,29</b>
41	0,00	0,00	0,02	-0,06	0,00	0,00	0,00	0,00	<b>-0,04</b>
42	-0,08	0,00	-0,01	0,42	0,03	-0,29	-0,01	0,00	<b>0,06</b>
43	0,07	0,00	0,01	0,27	0,00	0,00	0,00	-0,09	<b>0,25</b>
44	0,18	0,00	0,09	-0,58	0,05	-9,81	0,01	0,07	<b>-9,98</b>
45	0,03	0,00	0,00	0,00	0,00	0,26	0,00	0,00	<b>0,29</b>
46	0,00	0,00	-0,01	0,04	-0,01	0,00	0,00	0,00	<b>0,02</b>
47	0,11	0,00	-0,07	0,08	0,16	0,00	0,00	0,09	<b>0,37</b>
48	0,03	0,00	0,07	0,62	-0,95	-0,88	-0,01	0,12	<b>-1,00</b>
49	0,00	0,00	-0,01	0,06	-0,16	0,00	0,00	0,00	<b>-0,10</b>
50	-0,21	0,00	0,04	0,00	0,10	1,44	-0,01	0,07	<b>1,42</b>
51	0,03	0,00	0,02	0,96	-0,23	-0,41	0,00	-0,09	<b>0,28</b>



52	-0,04	0,00	-0,03	-0,44	0,00	0,00	0,00	0,00	<b>-0,51</b>
<b>TOTAL</b>	<b>-2,02</b>	<b>0,00</b>	<b>-0,83</b>	<b>-10,14</b>	<b>-2,05</b>	<b>-13,62</b>	<b>-1,24</b>	<b>-0,15</b>	<b>-30,05</b>
Average	-0,04	0,00	-0,02	-0,20	-0,04	-0,26	-0,02	0,00	-0,58

Emission reductions= (second evaluationx100/baseline evaluation) - 100 (unit: %)

Citizen number	Heating and hot water	Cold water	Electricity	Private transport	Public transport	Flights	Nutrition	Consumption of goods	Total
1	0%	115%	-1%	-46%	-92%	-100%	12%	-31%	<b>-35%</b>
2	33%	22%	18%	43%	0%	0%	-5%	0%	<b>14%</b>
3	-6%	-12%	-7%	0%	0%	0%	-16%	11%	<b>-2%</b>
4	0%	10%	-17%	-14%	-9%	0%	-1%	0%	<b>-6%</b>
5	0%	-4%	-32%	-12%	0%	0%	0%	0%	<b>-7%</b>
6	0%	-8%	-44%	0%	0%	0%	-7%	0%	<b>-1%</b>
7	-7%	-10%	10%	-40%	65%	0%	-26%	30%	<b>-4%</b>
8	21%	-8%	-5%	-20%	6%	19%	-15%	0%	<b>8%</b>
9	21%	-8%	-5%	-20%	6%	19%	-10%	0%	<b>8%</b>
10	0%	-14%	-2%	126%	1432%	0%	10%	11%	<b>68%</b>
11	21%	-8%	-5%	-5%	-20%	-100%	0%	0%	<b>-6%</b>
12	0%	-8%	-44%	0%	0%	0%	0%	0%	<b>-1%</b>
13	0%	115%	-1%	250%	-55%	-100%	-16%	0%	<b>-6%</b>
14	-44%	0%	-31%	-15%	-24%	0%	-5%	-5%	<b>-18%</b>
15	0%	115%	-1%	67%	0%	0%	0%	0%	<b>23%</b>
16	0%	-8%	-44%	0%	0%	0%	0%	0%	<b>-1%</b>
17	-30%	-40%	-35%	-11%	-88%	3%	-7%	-10%	<b>-10%</b>
18	0%	-7%	-14%	-27%	-88%	0%	-11%	30%	<b>0%</b>
19	213%	10%	-31%	-30%	-38%	0%	0%	0%	<b>-19%</b>
20	-1%	1%	7%	-83%	-32%	0%	0%	11%	<b>-62%</b>
21	271%	216%	41%	3%	-98%	0%	0%	0%	<b>48%</b>
22	0%	21%	24%	24%	0%	-100%	-5%	0%	<b>-13%</b>
23	0%	0%	-6%	64%	67%	-100%	-6%	-5%	<b>0%</b>
24	-28%	0%	1%	0%	0%	0%	0%	0%	<b>-2%</b>
25	-30%	-40%	-35%	-25%	-88%	3%	-11%	-10%	<b>-14%</b>
26	33%	-100%	9%	0%	-100%	0%	17%	0%	<b>9%</b>
27	213%	10%	-31%	0%	0%	0%	19%	0%	<b>19%</b>
28	-9%	0%	-21%	0%	0%	0%	145%	-5%	<b>3%</b>
29	-30%	-40%	-35%	-8%	-100%	-100%	23%	-10%	<b>-47%</b>
30	-9%	0%	-21%	-12%	-55%	0%	-5%	-5%	<b>-1%</b>
31	-26%	-2%	17%	-41%	-85%	0%	5%	-10%	<b>-20%</b>
32	-58%	-26%	-25%	0%	-45%	-56%	0%	0%	<b>-26%</b>
33	7%	-24%	-13%	-12%	100%	-84%	-6%	0%	<b>-14%</b>
34	-57%	-20%	53%	0%	-6%	0%	4%	0%	<b>-13%</b>
35	7%	-24%	-13%	-12%	0%	-84%	-14%	0%	<b>-15%</b>
36	-29%	0%	1%	120%	0%	0%	9%	0%	<b>24%</b>



37	-58%	-26%	-25%	0%	-45%	-56%	0%	0%	<b>-28%</b>
38	7%	-24%	15%	-5%	100%	-84%	-7%	0%	<b>-9%</b>
39	0%	0%	-6%	-10%	70%	-100%	-5%	-10%	<b>-14%</b>
40	-9%	0%	-21%	-11%	-37%	0%	-22%	-5%	<b>7%</b>
41	0%	0%	6%	-13%	0%	0%	0%	0%	<b>-1%</b>
42	-16%	0%	-4%	204%	62%	-100%	0%	0%	<b>2%</b>
43	14%	0%	5%	91%	7%	0%	0%	-7%	<b>8%</b>
44	55%	0%	62%	-88%	0%	-75%	2%	5%	<b>-60%</b>
45	11%	0%	1%	0%	12%	0%	0%	0%	<b>12%</b>
46	0%	0%	-3%	11%	-7%	0%	0%	0%	<b>1%</b>
47	28%	0%	-39%	462%	25%	0%	0%	7%	<b>12%</b>
48	4%	0%	51%	70%	-59%	-54%	-2%	9%	<b>-14%</b>
49	0%	0%	-3%	15%	-98%	0%	0%	0%	<b>-3%</b>
50	-64%	0%	20%	0%	34%	105%	-1%	5%	<b>31%</b>
51	4%	0%	7%	256%	-67%	-32%	0%	-7%	<b>5%</b>
52	-9%	-9%	-11%	-20%	-17%	0%	0%	0%	<b>-9%</b>
<b>Average</b>	<b>-6%</b>	<b>-4%</b>	<b>-7%</b>	<b>-10%</b>	<b>-25%</b>	<b>-16%</b>	<b>-3%</b>	<b>0%</b>	<b>-8,56%</b>

