

2011

D2.2. Report on the main results in each case study

WP2: Diagnosis of Everyday Practices of Production and Consumption

Low Carbon at Work: Modeling agents and
organizations to achieve transition to a low carbon
Europe

LOCAW - Grant Agreement number 265155
Workpackage 2 – Deliverable 2.2



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1 GENERAL INTRODUCTION

1.1 Aims of WP2



This report describes the main results of the Work Package number 2 on “Diagnosis of Everyday Practices of Production and Consumption”.

The WP2 is composed by a series of qualitative studies, carried out in four different countries (Spain, Romania, Italy, The Netherlands) in four different organizations (The University of Corunna in Spain, The Aquatim company in Romania, the Enel Green Power company in Italy, and the Municipality of Gorningen in The Netherlands).

The main aim of the WP2 is to provide an assessment of existing everyday practices and behaviours in the workplace, which have an impact on the level of greenhouse gas emissions. In order to fulfil the objectives of LOCAW, each national research team has studied the environmentally-relevant everyday practices in the four different organization considered, focusing on three main categories of organizational practices:

- Consumption of materials and energy
- Waste generation and management
- Organization-related mobility.

The results of the analyses conducted so far and reported in the present document will serve as a baseline in order to develop the next steps of the research activities previewed in the LOCAW.

The present report provides information on the way organizational processes are structured in higher education and research institutions, what kind of everyday practices workers perform and what policies the organization has implemented so far in order to enable transition to a more sustainable working environment and working practices.

For this baseline diagnosis, a mix of qualitative research approaches has been used, in relation to three different sources of data and information:

- a) Interviews with key-informers situated at different levels of decision-making
- b) Focus Groups.
- c) Document analysis

Thus, the results presented and the data obtained here as part of Workpackage 2, which constitutes the first stage of the LOCAW project, will be used to orient the next stages of the research, as well as to fine tune the research instruments for the following work packages.

In particular, the present results will be used to define with more detail the research methods, tools and procedures to be followed in the next work package (WP3), which will be focused on the investigation of the barriers and drivers of sustainable practices at work.

1.2 Methods and analyses used in WP2

Before reporting the results emerging from the various national research reports, some general information about the procedures used for the data gathering and for the qualitative analysis performed needs to be described below.

As indicated in the project, all the material gathered in this WP2 has been subject to thematic content analysis procedures (Braun & Clark, 2006; Ryan & Russel Bernard, 2003). It was possible to follow this kind of analysis for all the three data sources considered in this WP. The content analyses was performed by using Computer Assisted Qualitative Data Analysis Software (CAQDAS).

Speaking at a general level, our aim was to detect narrative themes referring to various issues related to the core theme of the LOCAW project, such as, in particular:

- a) patterns of production and consumption in the workplace;
- b) organizational strategies to reduce emissions and implement EU regulations regarding the “greening” of their production processes, both on internal (sustainable employee behaviours) and external (services and products) level;
- c) everyday practice and behaviours at work of employees at different levels of decision making within the organization;
- d) relationship between behaviours and practices at work and behaviours and practice outside work;
- e) patterns of interaction between relevant agents and stakeholders in the organization’s environment and the resulting barriers to and drivers for implementing sustainable practice and behaviours in the workplace;
- f) perceived individual environmental responsibility;
- g) environmental organizational responsibility as it is in members’ perception;
- h) corporate social responsibility (in particular as it concerns environmental issues).

As for data analysis, the CAQDAS package ATLAS.ti has been used.

All the material analyzed were stored in electronic format (.pdf, .doc and .rtf formats for text format files, such as organizational documents and interviews; .wma for audio files (as in the case of the Italian focus group).

According to the main guidelines described in the Deliverable 2.1, the first operative procedure when working with qualitative analysis through ATLAS.ti is the creation of an Hermeneutic Unit (HU).

Secondly, the main documents to be analyzed should be identified (*Primary Documents*). Then, each meaningful emerging content has been assigned a code, referring to main thematic areas identified in the preliminary phases of the qualitative research activities (see Deliverable 2.1): *Attitudes, Good practices, Values and Rules*. In the language of ATLAS.ti, these main thematic areas are called *Code families*.

The coding process has been conducted by following specific steps, such as:

- carefully reading of the data in the narrative stream;
- identification of text pieces or audio-segments meaningful for the objectives of analysis (which are normally referred to as “Quotations”). Each basic coded content unit is called “narrative theme” (Braun & Clark, 2006; Ryan & Russell Bernard, 2003);
- labeling these materials with a verbal code that synthesizes their content;
- assignment of a color referring to specific thematic domains identified in the general Situational analysis.

In the next paragraphs, the results of the qualitative research conducted by each national team will be presented and discussed with more detail.

NATIONAL REPORTS

2. SPAIN

National report
University of Corunna

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2.1 Introduction

2.1.1 Spanish Policies for the reduction of CO₂ Emissions

According to the Inter-governmental Panel of Experts on Climate Change (IPCC), Spain is one of the countries which will be affected by the consequences of climate change. As a European Union member, Spain is actively participating in the international climate negotiation processes and it has also defined general strategies, plans and policies to fulfil its international commitments to reduce GHG emissions. In 2007 the *Spanish Strategy for Climate Change and Clean Energy, Horizon 2001-2012-20*, was approved. It contains an Urgent Action Plan which, together with the Spanish Energy Efficiency and Energy Saving Action Plan, constitutes the general and sector-by-sector strategy for reducing the consumption of fossil-fuel energy, increasing energy efficiency, and promoting renewable sources of energy. Currently, the Autonomic Community of Galicia follows the same strategy, adapted to local and regional characteristics.

2.1.2 Case study: University of Corunna, Spain

The University of Corunna is a public, and relatively new, university. It was founded in 1989 and it has two campuses: A Coruña (with six different spatial locations: Maestranza, Riazor, Elviña, Zapateira, Bastiagueiro and Oza) and Ferrol (with two spatial locations: Esteiro and Serantes). Its staff today consists of 1,513 faculty and 760 administrative and service personnel. It has 24,554 students divided between the two campuses.

The University users, both staff and students, with their patterns of energy and materials consumption, waste generation and organization-related mobility, have a considerable impact on the environment in terms of GHG emissions. Furthermore, the University plays a key role in the education of citizens in general, and thus has the potential to be an important contributor to a low-carbon Europe. Its direct and indirect impact on society is considerable, as it can form citizens who are knowledgeable of environmental problems and solutions in our society today and who also know how to act in sustainable ways both in their homes and in the workplace – and are motivated to do so.

Since its foundation, UDC has developed research on issues related to sustainable development and the environment, through research groups working in Environmental Economy, Environmental Law, Environmental Chemistry and Biology, Environmental Education and Environmental Psychology. In order to integrate environmental knowledge from all these fields, in 1997 the University's Environmental Institute was created. This institute generated several initiatives that were managed by the Vice-Rectorate for the Environment and Infrastructure, and later became the Office for the Environment. All these institutional structures, together with the work of several research groups (including the People-Environment Research Unit as one of the most active) support multidisciplinary research on environmental behaviour and on the development of strategies to connect research with public policy within the Network of Municipalities for Sustainability.

2.2 Document analysis



2.2.1 Analysed documents

A set of relevant University documents were gathered for this research. The team had access to the website, brochures, environmental and social reports, and other relevant documents with information about the environmentally-relevant activities being promoted by the University. In order to understand what has been done so far by the University to promote environmental policy that would contribute to a reduction of GHG emissions, as well as what is still missing, the following actions were carried out:

- a) An interview with the director of the Office for the Environment (OFE), a structure integrated within the Vice-Rectorate for Infrastructure and Environmental Management;
- b) A review of the web of OFE;
- c) Printed documents belonging to the Office for the Environment;
- d) Website and organizational documents of the University.

Once all the needed material was collected, a selection of the most relevant data was made. The three main dimensions addressed by LOCAW were taken into consideration: a) Consumption of materials and energy; b) Waste generation and management; and c) University-related mobility. The results of the document analysis is presented below.

2.2.2 Making the University more sustainable: documents, tools and commitments

In 2003, the University funded the Vice-Rectorate of Infrastructure and Environmental Management, with a mandate to promote policy that would make the university more sustainable. In 2005, the University also became part of the Conference of Rectors of Spanish Universities (CRUE), within which it coordinates a work group on urban planning related to campus infrastructure.

The University has established an action strategy for sustainability at the institutional level, with the following steps:

- 1) Establish a comprehensive strategy for sustainability and emissions reductions for the University.
- 2) Create organizational structures within the Government of the University that would insure that planned actions are being carried out.
- 3) Promote commitment to the values of sustainability among the members of the University.
- 4) Establish a system of technical support for the implementation of sustainability policies.
- 5) Implement follow-up and monitoring procedures to ensure policy measures are adequate and fulfil the set objectives.

In specific terms, the university has done the following things to reach the above-mentioned steps: : a) it has elaborated a Sustainability Guide, b) has created the Environmental Committee, c) has created the Office for the Environment, d) has elaborated sectorial and central plans to ensure environmental sustainability, and e) it has periodically published the Local Sustainable Report.

2.2.3 The organizational commitment of the University with sustainability

The University has also formalized its commitment with sustainability in the creation of the Office for the Environment and the elaboration of the first sectorial (area) plans for the environment. Also, the University has approved a Sustainability Guide, which establishes the tools for the management, follow-up and evaluation of the environmental measures that the University is implementing.

The Guide was followed by a Sustainability Plan which makes more specific the norms and actions to be taken to transform the University into a more sustainable organization. In addition, the University is responsible of the Sustainable Urban Planning Committee of the CRUE (Conference of Rectors of the Spanish Universities), and is part of the “Sustainable Energy Network of ACoruña”. Other adhesions to international declarations related to the promotion of sustainability are under study.

2.2.3.1 Environmental Planning

The Guide stipulates that the Office for the Environment will coordinate the elaboration and implementation of the Sectorial Environmental Plans, with the special participation of the Architecture and Urban Planning Service (SAU), as well as other services of the University. The Sectorial Plans are specifically-designed strategies for transforming each area of activity within the university into a sustainable one. The Sectorial Plans include specific environmental criteria the university should follow both in its acquisitions as in contracting. Thus, the University establishes the following priorities:

- a) Shopping those goods fulfilling environmental and fairness criteria.
- b) Selecting service companies with environmental certifications.
- c) Buying local products and from local companies.
- d) Introducing environmental conditions in competitions for work and infrastructures.

The University also plans to create an *Environmental Commission* (CA), and stimulate student participation by creating the *Network of Students for the Environment of the University of Corunna*.

2.2.4 Some data on emissions resulting from energy consumption, waste managements and organizational mobility

2.2.4.1 Mobility emissions

Around 50% of the university community uses private cars to travel between their homes and the university. Around 35% use the bus and 13, 5 % walk to and from the university. Other transport means are used only marginally: the train (0,8%), the bicycle (0,33%) and motorcycles (0,15%). CO₂ emissions data are presented in Table 2.1, classified by group of users and building location:

Table 2.1. Estimated emissions by user group and building location (t CO₂)

<i>Location-campus</i>	<i>Colective</i>			
	Students	Adm.	Faculty	Total
A Zapateira	1.866,68	78,68	347,14	2.292,50
Bastiagueiro	310,49	11,47	7,5	329,46
Elviña	4.342,07	189,99	460,13	4.992,20
Esteiro+Serantes	884,33	313,1	134,9	1.332,33
Maestranza		69,95		69,95
Oza	212,39	3,35	52,83	268,57
Riazor	440,47	0,64	42,33	483,45
TOTAL	8.056,43	667,2	1.044,83	9.768,47

The total number of CO₂ emissions in 2008 was 9.768,5 tons. The use of private vehicles accounts for 89% of emissions. The whole university community travels by car an average of 761.324 Km per day, and an average of 88 million Km per year.

2.2.4.2 Emissions related to waste, paper and water use

The total amount of CO₂ emissions related to the consumption of water and paper on the one hand, and waste management on the other is 534847 Kg of CO₂ per year (See table 2.2, which represents 2,5 % of the total number of CO₂ emissions of the University of Corunna (UDC)

Table 2.2. CO₂ Emissions (kgCO₂/year) related to waste management and to the consumption of paper and water

<i>Building location</i>	Water	Paper	Waste
Maestranza	125	2.762	2.038
Riazor	2.119	19.064	14.066
Elviña	17.119	137.183	101.663
A Zapateira	6.957	62.810	47.678
Oza	1.012	12.206	9.006
Bastiagueiro	4.082	11.235	8.362
Esteiro	1.434	25.138	18.720
Serantes	1.334	16.478	12.257
TOTAL	34.180	286.877	213.790

2.2.4.3 Energy consumption and resulting emissions

Energy consumption in the university buildings is related, on one hand, to the general needs of heating, lighting and technology use and, on the other hand, to other specific needs of groups of users given the characteristics of certain buildings. 56 % of total emissions are a results of electricity use and the other 44 % to the use of diesel fuel. Table 2.3 shows the consumption of energy per building and the resulting CO₂ emissions.

Table 2.3. Energy consumption and CO₂ emissions per building

	Electricity (kWh)	Diesel fuel (L)	CO ₂ emissions (kg)
Maestranza	517.699	3.932	312.863
Riazor	301.982	97.996	676.592
Elviña	7.728.702	362.665	5.170.305
A Zapateira	2.953.640	221.015	2.499.773
Oza	492.365	39.401	386.025
Bastiagueiro	599.024	164.970	851.607
Esteiro	1.181.435	92.319	1.054.276
Serantes	383.622	43.002	377.258
Total	14.158.469	1.025.300	11.328.699

2.2.5 The carbon footprint (CF) of the University of Corunna

The main elements included in the calculation of the Carbon Footprint (CF), which is expressed in hectares (HA) of forest that would be needed to absorb the CO₂ emissions, are, in order of emissions percentage:

- 1) Mobility (43%).
- 2) Electricity consumption (25,4%).
- 3) Diesel fuel or heating fuel (12,6%).

The University of Corunna's Carbon Footprint was estimated to be 3.475 Hectars of Galician forest. This means that the CF of the University of Corunna would involve a forest territory 50 times greater than the territory presently occupied by the campuses of the university to absorb CO₂ emissions. Percentages of the UDC Carbon Footprint components are showed in Figure 2.1 below.

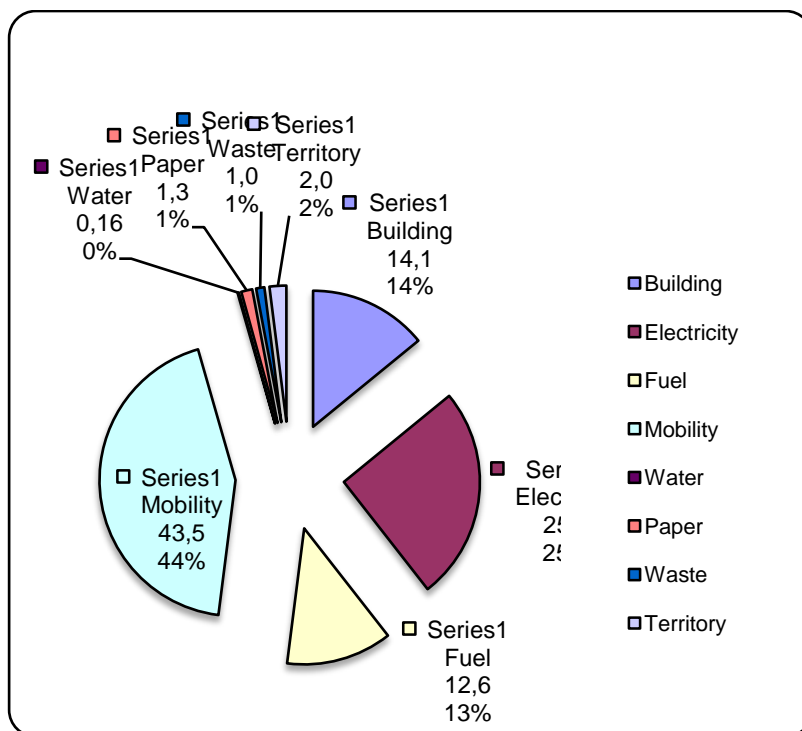


Figure 2.1. Contribution of each element to the CF of the UDC in percentages

2.2.6 Some ongoing actions

Between 2008 and 2010, the University has implemented several measures to reduce CO₂ emissions. The most important one was the installation of “*Thermostatic Valves*”, a mechanism designed to allow the control of heat emission in water radiators, adapting it to the temperature of the environment and thus reducing energy consumption and CO₂ emissions (by 289,75 Ton/year). Table 2.4 presents all the actions taken in the specified period to reduce emissions.

Table 2.4. Environmental actions carried out in the University of Corunna between 2008 and 2010

Actions 2009/2010	ENERGY
	Management directives for the installation of environmentally respectful infrastructures
	Photovoltaic infrastructure installation in the Information and Communication Technology Research Center
	Photovoltaic infrastructure in the Physical Education faculty
	More efficient outdoor lighting
	More efficient indoor lighting
	Bioclimatic system in ‘XoanaCapdeville’ building
	Hydrothermal heating system installation in the University Club
	Installation of environmental management and monitoring systems in several university buildings
	WATER: ‘Sostauga’ project
	Improving water quality according to the EU Framework Directive of Water
	Advancing towards a self-sufficient and sustainable management of water
	Installing water spouts
	Change of taps and cisterns to more efficient ones which minimize water escapes
	WASTE
	Implementation of a composting pilot program
	MOBILITY
	Bicycle Loan Service
	Construction of a Bicycle lane

Some proposals for new actions to reduce emissions have already been approved for the next years (see Tables 2.5 and 2.6).

Table 2.5. Proposed environmental actions for the following years at the University of Corunna in the areas of Mobility, Waste, Paper, and Water

Proposals to be carried out in the near future (2011-...)	MOBILITY
	Design of a new road system on campus
	Regulation of public transport access lanes and residential traffic areas on campus
	Implementation of a 30 km/h speed limit on Campus, giving priority to pedestrians and bicycle users.
	Design of a campaign to reduce private car use and promote carpooling
	Establishing the most efficient locations for bus stops
	Promoting a train stop in campus to allow multi-modal public transport use and connect campus transport with general urban public transport
	Inter-urban public transport: Re-structuring services and lines, to ensure adequate and useable public.
	Increasing the UDC bicycle network, connecting campuses with town
	Increase the number of campus bicycles available for loaning to 350 bicycles.
	WASTE
	Implementation of the compost program into the whole university.
	Designing a selective collection and management plan.
	Implementing an efficient system of recycling and selective collection of waste in each building.
	Streamlining university waste management with waste services provided by the Municipality.
	Reducing packages and bottles in food and drinks, promoting returnable bottles and cans.
	Reducing waste, and especially dangerous waste.
	Promoting green and responsible shopping
	Promoting the separate collection of computer materials, batteries, toners etc.
	Establish an environmental clean spot
	Reviewing and changing services that are not fulfilling waste norms and rules
	PAPER
	Reducing consumption: Further promotion of the use of e-mail
	Separate and collect waste separately in each center
	Promote the use of recycled paper, and make this mandatory for the copy services on campus
	Increase the number of waste containers
	WATER
	Optimizing demand by introducing saving measures on campus
Minimizing water escapes and waste in the water transport system.	
Create a network of fresh water fountains on campus	
Optimize and improve urban waste water	

Table 2.6. Proposed environmental actions for the following years at the University of Corunna in the area of energy consumption

Proposals to be carried out in the next future (2011-..)	ENERGY	
	1. Improve indoor lighting	Making better use of natural light
		Cleaning and replacement of light sources with low-energy ones
		Area control of light to adapt to outdoor lighting conditions
		Install movement detectors and timers in lighting
	2. Improve public lighting	Replacement of mercury lamps by low-energy lamps
		Changing halogen lamps and other inefficient types of light sources
	3. Improve energy use for heating	Renewing old heating systems
		Replacing diesel with gas fuel
		Improving isolation systems in buildings
		Area control of heating systems
		Replace outdated heating systems
	4. Renewable energy installations:	Implementing a thermic solar system in the Technological Research Centre in Civil Engineering
		Photovoltaic solar implementation for the Advanced Scientific Research Centre
		Photovoltaic Solar Installation for the University Civic Centre of Ferrol
	5. Adopt environmental management and monitoring systems	Establish monitoring and follow-up procedures for energy installations
		Systematic use of energy audits
		Environmental improvement of new and reformed buildings
		Dissemination of the environmental measures to the university community

2.2.7 Conclusion

The global estimated emissions of UDC for 2008 were 21.348 t CO₂, with an average of 906 kg of annual emissions per capita, with significant differences between the two campuses. The different types of activities undertaken by each campus and the location of campus buildings are the main factors explaining the variation between the two.

As results presented in the documents of the University have shown, actions should be focused on improving energy efficiency and changing transport patterns in the university community, as these two areas account for 81,5 % of CO₂ emissions. Emissions resulting from the consumption of water, paper and generation of waste only represent 2,5% of the total CO₂ emissions, but actions focusing on these areas are still important for their educational value, for raising awareness regarding the importance of environmentally-respectful behaviors and for their potentially large multiplying effect through students.

The document analysis allows us to conclude that CO₂ emissions of the University of Corunna are a result of its energy management and consumption patterns, as well as of its mobility patterns. Mobility patterns condition transportation from and to the university and generate more than 9.700 tons of CO₂, as Table 2.1 shows. The University has thus previously measured its CO₂ emissions, showing a will to adopt measures to transform these patterns into more sustainable ones.

Any future action plan should take this into consideration and try to identify the causes that lead to unsustainable practices.

Our revision of the selected documents has also shown the actions the University has undertaken until now and also to become aware of their proposals and plans for reducing CO₂ emissions in the coming years. The most obvious conclusion is that the University of Corunna needs to establish and implement both an energy plan and a mobility plan. Once these plans have been implemented, the university should establish a series of indicators to monitor progress. Improvements in the quality of transport, a higher level of energy saving and good communication and information strategies regarding environmental issues on campus will increase environmental awareness and performance, leading to a more sustainable organization.

2.3 Interviews with key-informers

In the second stage of our diagnosis of environmentally relevant everyday practices, a number of key-informers, situated at different levels of decision-making within the university, were interviewed.

Taking into consideration the size of the University, and its territorial distribution (8 locations), a practical tool was built to conduct the interview. This tool, built as a questionnaire, was distributed among Deans, Head of Departments, Porters, Heads of Administrative Services, Heads of Financial Units, as well as a number of Faculty. A total of 200 questionnaires were distributed, taking into consideration the distribution of gender, campus and building locations.

2.3.1 Description of the interview tool

The tool was designed to collect relevant information about everyday practices in the workplace, and identify barriers and drivers of sustainable behavior at work.

The questionnaire was structured in such a way as to provide information on three categories of practices:

- a) Consumption of materials and energy (see Table 2.7a, 2.7b, and 2.7c).
- b) Waste generation and management (see Table 2.8a, 2.8b, and 2.8c).
- c) University-related mobility (see Table 2.9a, 2.9b, and 2.9c).

For each category of practices, questions were made regarding three types of evaluations:

- 1) The perception of the respondent about the actual observed practices of the staff in his/her building.
- 2) The perception of the respondent about the importance s/he thinks the University gives to these practices.
- 3) The perception of the respondent about the importance s/he thinks the other workers give to these practices.

Each item had four possible response categories that the respondent could mark:

- (a) Practices you have observed.- The possible answers were: (99) Don't know/No answer; (1) This practice does not exist /is never performed in my building; (2) This practice is sometime performed ; (3) Many times; (4) Always.
- (b) Importance conceded by the University of Corunna or by the workers of the University: (99) Don't know/No answer; (1) None; (2) A little; (3) Quite a lot; (4) A lot.

Previous information of energy, water and paper consumption, as well as waste management and mobility practices was already available, as the university has measured this through a series of indicators in the last three years.

Data was gathered on the practices people adopt at home and the changes they have made in their environmental practices in the last three years in the areas of energy, paper and water consumption, waste management and mobility. Finally, information was collected on the definitions people give to the concept of sustainability, the level of perceived sensibility with the issue of climate change and demographic characteristics. All data will be analyzed in this report.

After distributing 200 questionnaires, covering every building and service of the University, only 95 interviews were sent back to our Project Office. 82% of the interviews came from the Campus of Corunna, while 18% came from the Campus of Ferrol. The majority of respondents (91, 8%) belongs to academic buildings, and is dedicated to teaching and research functions.

Regarding gender, the sample was relatively well balanced, with 54,7% males and 45,3% female subjects. The age range of the sample was between 23 and 68 years old. Finally, the majority does not belong to a Union (73, 9%) nor are they Union representatives (88, 2%).

One of our concerns regarding the tool we used for data collection was to find if the respondents differentiated among the three different categories of perceptions we asked for or if they could not discriminate between the observed practices, the importance conceded by the University, and the importance conceded by workers to those practices.

Figure 2.2 shows the results of the Multidimensional Scaling (MDS) analysis of the 19 x 3 items we performed, and we can see that the three distributions are different. This means that the respondents could understand and discriminate among the three categories of questions asked.

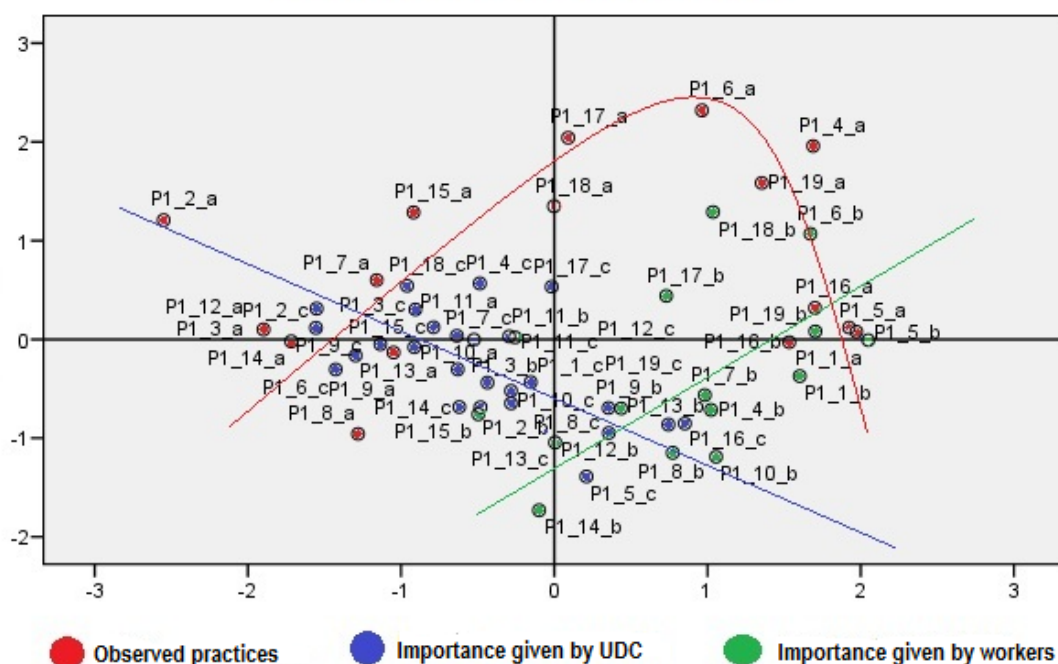


Figure 2.2.- Common space of the 57 items related to the consumption of materials and energy, that consider: (a) the observed practices, (b) the perceived importance conceded by the University, and (c) the perceived importance assigned by its workers.

We obtained the same result with a MDS solution of the items related to the generation and management of waste (see Figure 2.3).

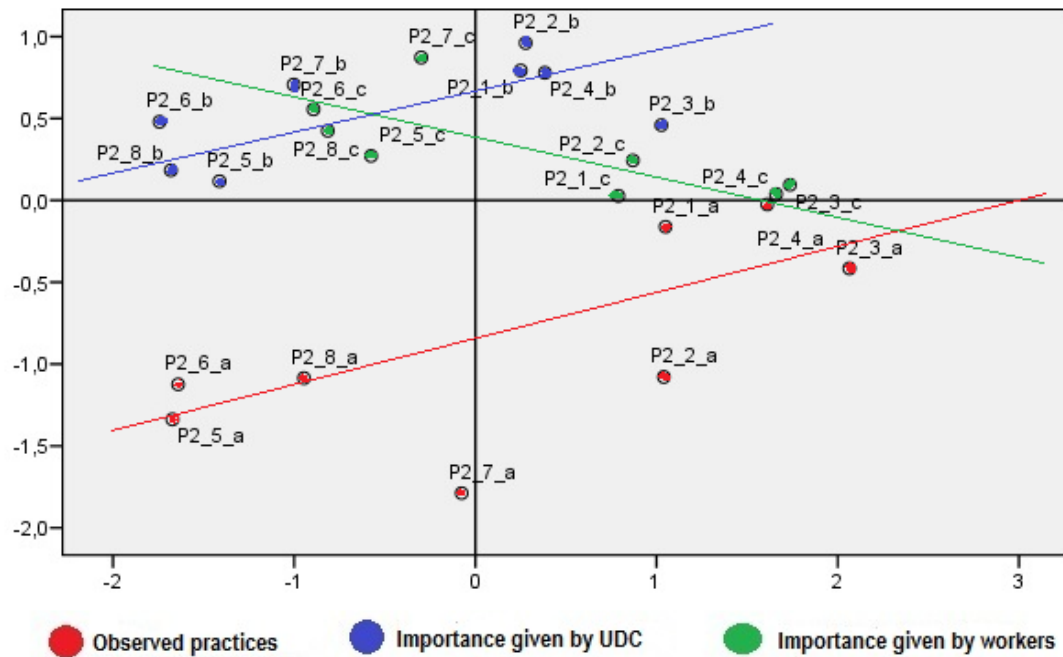


Figure 2.3.- Common space of the 24 items related to waste generation and management , that consider: (a) the observed practices, (b) the perceived importance attributed to the practices by the University, and (c) the perceived importance assigned to the practices by workers.

Again, the same result can be observed in the common space derived by MDS for the items related to the University-related mobility (see Figure 2.4).

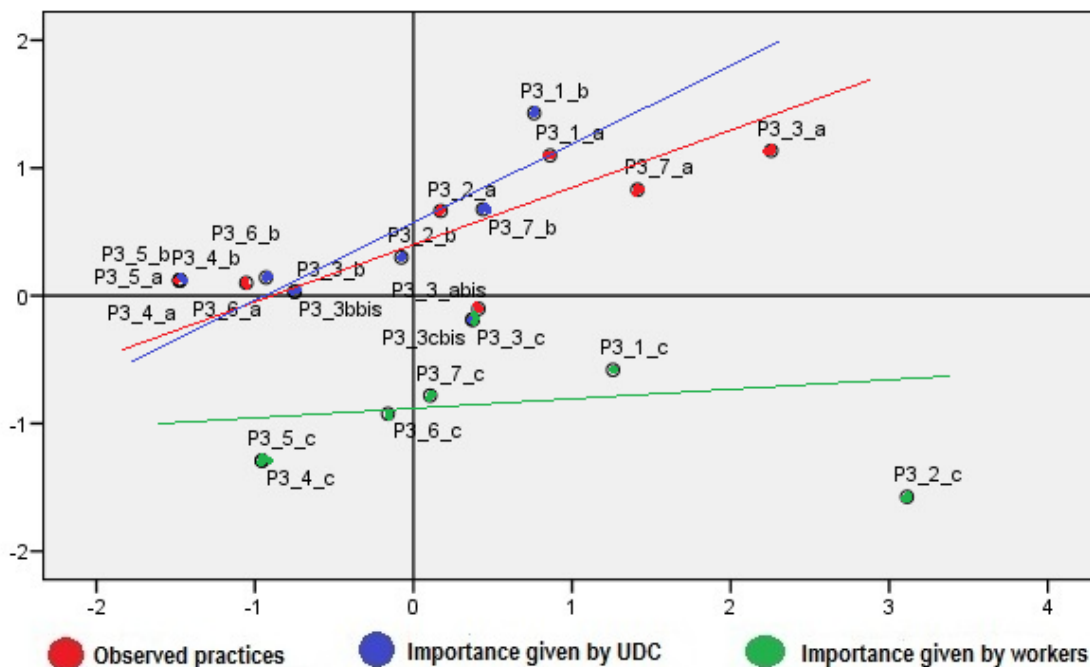


Figure 2.4.- Common space derived by MDS for the 21 items regarding the University-related mobility, that consider: (a) the observed practices, (b) the perceived importance attributed to the practices by the University, and (c) the perceived importance assigned by workers.

2.3.2.3 Understanding the underlying response

Observing clusters for items related to consumption of materials and energy

The dendrogram derived from hierarchical cluster analysis shows two main clusters. These clusters differentiate between practices over which the individual feels it can exert control, and practices that are controlled by the university as an institution (see Figure 2.5).

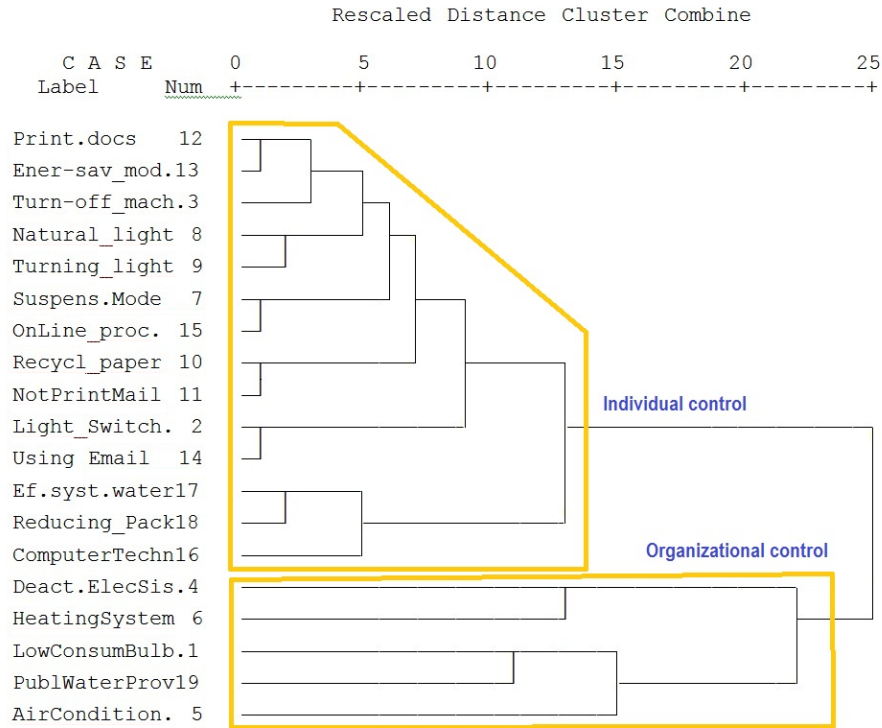


Figure 2.5.-Dendrogram derived from cluster analysis, showing two main clusters corresponding to individual and organizational control over energy and materials consumption

Observing clusters for items related to waste generation and management

Cluster analysis shows similar results in the case of waste-related practices (see Figure 2.6).

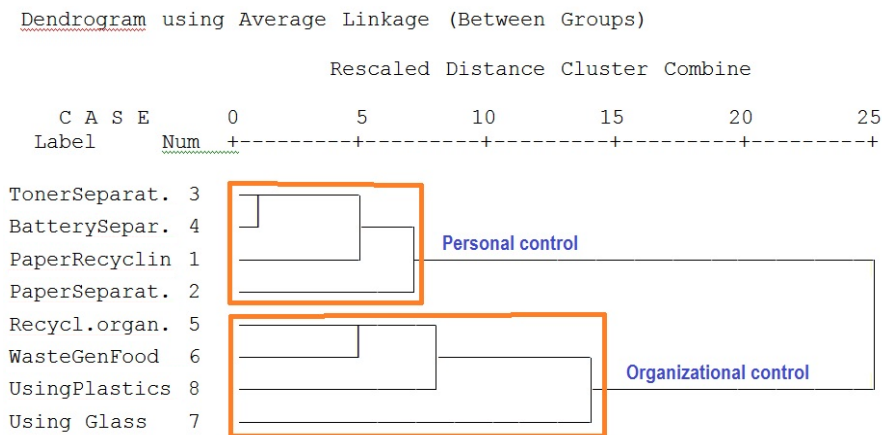


Figure 2.6.-Dendrogram derived from cluster analysis, showing two main clusters corresponding to personal and organizational control over waste generation and management

Observing clusters for items related to organizational mobility

Cluster analysis in this case shows two underlying dimensions related to mobility. The first cluster refers to transportation between one's home and the university, while the second cluster refers to mobility related to professional meetings with colleagues from other academic institutions (both national and international) (see Figure 2.7).

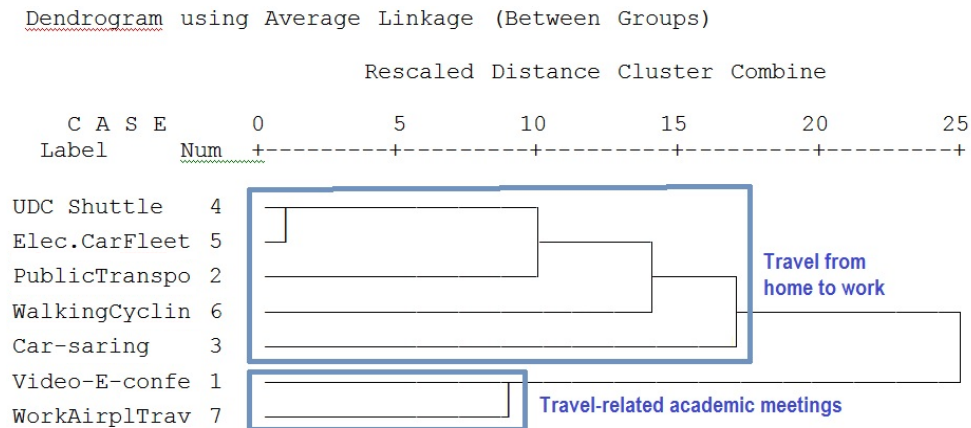


Figure 2.7.-Dendrogram derived from cluster analysis, showing two main clusters for mobility practices. This case is more difficult to interpret.

2.3.2.4 Practices related to consumption

In this section, we will present the following results: first, the answers provided by the subjects to the questions on their general level of “sensitivity with sustainability climate change”; secondly, results on the perception of consumption-related practices in the areas of energy, water and paper, both at home and at work, are presented.

In all tables presenting results in this report, for every item there are two lines of percentages: the first line reports the percentages calculated for the whole sample, while the second line presents results only for the subjects who have answered the question, and thus ignores the missing values.

Also, high percentages are sometimes signalled in different colors. When one color is used, it means all the high percentages are concentrated on either the positive or the negative side of the scale. When two colors are used, it is to signal the fact that the sample responses are divided on that particular issue, and we can find high percentages in both the positive and the negative sides of the response scale.

2.3.2.5 Practices related to consumption at home

The majority of respondents consider themselves to be quite sensitive to the issues of sustainability and climate change: 93, 6 % of the subjects describe themselves as either “very sensitive”, or “somewhat sensitive” (see Figure 2.8).

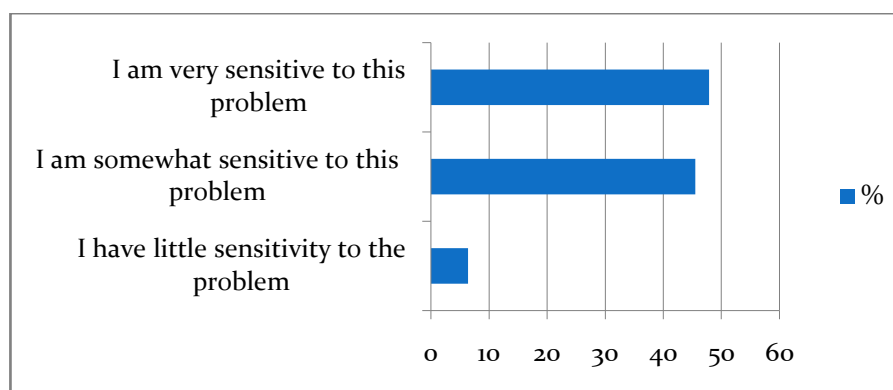


Figure 2.8.- Personal sensibility regarding the issues of sustainability and climate change

The majority of the sample provides an accurate description of Sustainable Development or Sustainability. Furthermore, 76% of the respondents say they are either somewhat sensitive or very sensitive with this issue. In addition, 71,4% say they have changed their environmental and, more specifically, their consumption practices in the last three years.

When asked about what kind of changes they have made at home, the majority (see figure 2.9) mentions actions that belong to the category of “saving energy” (82,8 %) followed by “saving paper” (71,7%), and finally, by “saving water” (66,7%). As this was an open question, we can list the type of actions that workers say they have undertaken in their homes, in the last 3 years.

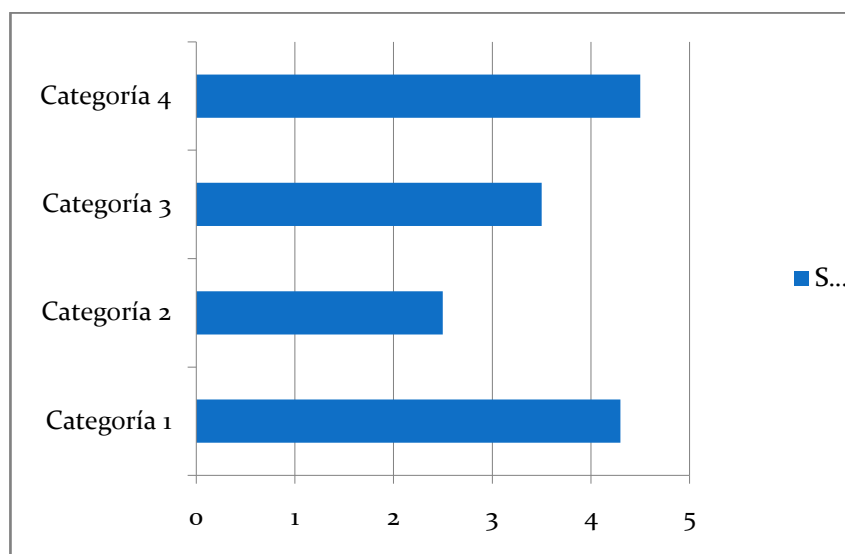


Figure 2.9. Percentage of respondents who said they have changed practices in the areas of energy, paper and water saving.

Saving energy:

- Use of low energy light bulbs.
- Heating: keeping the heat on for less time; installing thermostats or programmers, keep temperatures lower, thermic isolation (change of windows, use of double-glass windows, or wall isolation), or replacement of boilers and use of condensation boilers.
- More care in turning lights off when they are not necessary.
- Turning off electric household appliances.
- Other less commonly-mentioned decisions have to do with: a) Use of type A electric household appliances, b) Use of solar panels, c) use of multiple socket adaptors, d) area control of lights turning on/off, e) controlled ventilation of rooms, f) using ecologic programs of the electric households appliance, g) using low consumption radiators, or h) using rechargeable batteries.

Saving paper:

- Avoiding printing, use paper on both sides, double-side printing
- With a lower frequency, subjects mention the use of recycled paper or separating paper for recycling
- Other less-mentioned decisions have to do with: a) printing two pages on each side of the paper b) printing in draft or saving mode; c) Reading documents on the computer; d) the use of electronic books.

Saving water:

- Shower instead of taking a bath.
- Use the washing machine only at full charge.
- Use the dish-washer only when full
- Small flush cisterns.
- Close taps when washing or cleaning, when water is not necessary.
- Other less mentioned decisions are: a) use of type A electric household appliance; b) revision of the installation to avoid water waste or escapes; c) use of water diffusers in taps or avoiding the irrigation of plants;; d) use of ecologic programs of the electric households appliances; e) Irrigation of plants using recycled water; f) use of cold water in the washing machine, g) reduced use of the dryer; h) reduced time spent in the shower.

Consumption practices in the University of Corunna

Table 2.7a shows the results regarding the observed practices in the organization. The first column presents the number of subjects that have answered to each of the questions and the next columns present the percentage of respondents for each category of response. The highest percentages are shown in beige.

We can observe that we have obtained responses from the whole sample at only two items, in spite of the fact that we do not have missing values, although there are some responses of Don't know/No answer. This is probably due to the fact that the two items refer to widely performed practices within the organization, and thus easier to perceive:

1.10 Use of recycled paper

1.12. Print documents only when necessary

Among the positively perceived practices, we can find the ones referring to the control of machines and lights, the use of computers, saving energy in printing, the use of natural light or the rational control over turning lights on or off, and the dominant use of email and computerized practices in the university

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On the contrary, the practices that are rarely perceived or not at all, either because they cannot be directly perceived and are not known or because they do not exist in some of the buildings, refer to the centralized switch-off of air conditioning and the individual regulation of heat.

An observation is in order for the items 1.6 “Autonomous regulation of heating systems” 1.16. “Receiving information on the use of computerized techniques to reduce paper consumption” and y 1.19. “Use of public water providers”. For these items, we have obtained high values both in the categories of “Don’t know/NA” and “Doesn’t exist” on the one hand, and “Sometimes” or “Always” on the other. The explanation for this is that different buildings and centers have different installations and policies implemented. The existence of different policies shows that coordinated plans are either non-existent or are not well implemented.

Table 2.7a. - Perception of key infomers of practices related to the *consumption of materials and energy* in the university (the first line indicates percentages for the whole sample, while the second indicates percentages without the missing values. The blue color in item 1.6 shows high percentages can be found on both sides of the scale)

	(a) Practices you have observed					
	N	Don't know/NA	Doesn't exist	Sometimes	Many times	Always
1.1. The use of low consumption bulbs	95	13.7	21.1	32.6	18.9	10.5
	92	14.1	21.7	33.7	19.6	10.9
1.2. Control of light switching at the end of the day.	95	8.4	4.2	7.4	21.1	56.8
	93	8.6	4.3	7.5	21.5	58.1
1.3. Control of turning equipment off at the end of the day	95	9.5	7.4	15.8	27.4	37.9
	93	9.7	7.5	16.1	28.0	38.7
1.4. (De)activation of the electric system	95	26.3	28.4	10.5	9.5	13.7
	84	29.8	32.1	11.9	10.7	15.5
1.5. Autonomous regulation of air conditioning	95	21.1	34.7	8.4	10.5	9.5
	80	25.0	41.3	10.0	12.5	11.3
1.6. Autonomous regulation of heating systems	95	4.2	40.0	10.5	25.3	16.8
	92	4.3	41.3	10.9	26.1	17.4
1.7. Use of suspension mode for computers and other equipment	95	5.3	9.5	21.1	32.6	25.3
	89	5.6	10.1	22.5	34.8	27.0
1.8. Use of natural light as long as possible	95	4.2	9.5	31.6	25.3	27.4
	93	4.3	9.7	32.3	25.8	28.0
1.9. Turning lights on/off in different places according to use patterns	95	2.1	5.3	30.5	30.5	29.5
	93	2.2	5.4	31.2	31.2	30.1
1.10. Use of recycled paper	95	3.2	16.8	47.4	23.2	9.5
1.11. Invitation not to print emails	95	8.4	15.8	27.4	30.5	14.7
	92	8.7	16.3	28.3	31.5	15.2
1.12. Printing documents only when necessary	95	3.2	4.2	21.1	52.6	18.9
1.13. Use of energy saving options in printing (draft, 2 pages per paper, two-sides)	95	2.1	4.2	33.7	35.8	22.1
	93	2.2	4.3	34.4	36.6	22.6
1.14. Use of email more than of regular mail	95	-	6.3	45.3	47.4	-
	94	-	6.4	45.7	47.9	-
1.15. Established online procedures (forms etc.)	95	2.1	7.4	15.8	53.7	16.8
	91	2.2	7.7	16.5	56.0	17.6
1.16. Do you receive information on computerized techniques to reduce paper consumption? (e.g.: sending PDF documents instead of printed ones)	95	5.3	31.6	28.4	26.3	6.3
	93	5.4	32.3	29.0	26.9	6.5
1.17. Efficient systems of water use (tanks, faucets ...)	95	5.3	20.0	28.4	26.3	16.8
	92	5.4	20.7	29.3	27.2	17.4
1.18. Reduce use of packaging	95	18.9	14.7	22.1	31.6	6.3
	89	20.2	15.7	23.6	33.7	6.7
1.19. Use of public water providers	95	9.5	22.1	18.9	30.5	11.6
	88	10.2	23.9	20.5	33.0	12.5

The perceived importance the University concedes to sustainable consumption practices

Table 2.7b presents the results on the perception of the respondents of the importance the university attributes to specific sustainable practices

The data here shows that university members lack knowledge of the existence of university policies regarding the three categories of practices under study. There is also a perception that the university does not consider these practices as important, except for the items 1.2, 1.14 y 1.15, which refer to “control of light switching at the end of the day”, “More frequent use of email than of regular mail”, “Established online procedures”. Again, these practices are widely performed in the university and they are thus widely known by university members.

For items 1.12 and 1.19, we can see that the perception of respondents is divided: although the perception regarding the importance attributed by the university is still quite negative, the percentages of positive responses is relatively high as well (28,7 % and 24,1 % respectively). Considering these are key-informers, this is significant, and these areas can be the focus of the improvement of policy communication strategies at the university level.

Table 2.7b.- Perception of key informers of the importance attributed by the university to the practices of materials and energy consumption ((the first line indicates percentages for the whole sample, while the second indicates percentages without the missing values. The blue color in items 1.12 and 1.19 shows high percentages can be found on both sides of the scale)

	(b) Importance conceded by the University of Corunna					
	N	Don't know/NA	None	A little	Quite a lot	A lot
1.1. The use of low consumption bulbs	95 87	14.7 16.1	23.2 25.3	27.4 29.9	21.1 23.0	5.3 5.7
1.2. Control of light switching at the end of the day.	95 87	14.7 16.1	8.4 9.2	17.9 19.5	26.3 28.7	24.2 26.4
1.3. Control of turning equipment off at the end of the day	95 85	20.0 22.4	16.8 18.8	20.0 22.4	13.7 15.3	18.9 21.2
1.4. (De)activation of the electric system	95 85	30.5 34.1	22.1 24.7	13.7 15.3	10.5 11.8	12.6 14.1
1.5. Autonomous regulation of air conditioning	95 76	26.3 32.9	25.3 31.6	13.7 17.1	10.5 13.2	4.2 5.3
1.6. Autonomous regulation of heating systems	95 84	9.5 10.7	38.9 44.0	18.9 21.4	14.7 16.7	6.3 7.1
1.7. Use of suspension mode for computers and other equipment	95 84	27.4 31.0	26.3 29.8	17.9 20.2	7.4 8.3	9.5 10.7
1.8. Use of natural light as long as possible	95 85	16.8 18.8	24.2 27.1	18.9 21.2	18.9 21.2	10.5 11.8
1.9. Turning lights on/off in different places according to use patterns	95 87	17.9 19.5	22.1 24.1	24.2 26.4	18.9 20.7	8.4 9.2
1.10. Use of recycled paper	95 89	13.7 14.6	27.4 29.2	34.7 37.1	10.5 11.2	7.4 7.9
1.11. Invitation not to print emails	95 85	15.8 17.6	13.7 15.3	33.7 37.6	17.9 20.0	8.4 9.4
1.12. Printing documents only when necessary	95 87	18.9 20.7	15.8 17.2	28.4 31.0	22.1 24.1	6.3 6.9
1.13. Use of energy saving options in printing (draft, 2 pages per paper, two-sides)	95 86	24.2 26.7	20.0 22.1	32.6 36.0	10.5 11.6	3.2 3.5
1.14. Use of email more than of regular mail	95 87	5.3 5.7	7.4 8.0	13.7 14.9	44.2 48.3	21.1 23.0
1.15. Established online procedures (forms etc.)	95 85	6.3 7.1	10.5 11.8	16.8 18.8	43.2 48.2	12.6 14.1
1.16. Do you receive information on computerized techniques to reduce paper consumption? (e.g.: sending PDF documents instead of printed ones)	95 88	14.7 15.9	30.5 33.0	20.0 21.6	18.9 20.5	8.4 9.1
1.17. Efficient systems of water use (tanks, faucets ...)	95 87	13.7 14.9	25.3 27.6	25.3 27.6	17.9 19.5	9.5 10.3
1.18. Reduce use of packaging	95 83	37.9 43.4	13.7 15.7	22.1 25.3	11.6 13.3	2.1 2.4
1.19. Use of public water providers	95 86	20.0 22.1	18.9 20.9	16.8 18.6	26.3 29.1	8.4 9.3

Perceived importance workers concede to sustainable consumption practices

Table 2.7c presents data on the perception of key informers of the importance conceded by workers to the different practices.

We can observe here that respondents consider that workers concede more importance to these practices than the university. Responses here are higher in the categories of “a Little”, “Quite a lot” and

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“A lot”, while in the previous table we could see higher rates of response in the categories of “Don’t know/NA” and “None”. The items 1.6 (“Autonomous regulation of heating systems”), 1.14 (“Use of email more than regular mail”) and 1.15 (“Established online procedures”) have the highest values.

Table 2.7c. - Perception of key informers of the importance attributed by workers to the practices of materials and energy consumption

	(c) Importance assigned by workers of this University				
	N	Don't know/NA	None	A little	Quite a lot
1.1. The use of low consumption bulbs	95	15.8	7.4	36.8	21.1
	83	18.1	8.4	42.2	24.1
1.2. Control of light switching at the end of the day.	95	8.4	4.2	26.3	25.3
	85	9.4	4.7	29.4	28.2
1.3. Control of turning equipment off at the end of the day	95	9.5	4.2	29.5	27.4
	84	10.7	4.8	33.3	31.0
1.4. (De)activation of the electric system	95	27.4	11.6	21.1	14.7
	80	32.5	13.8	25.0	17.5
1.5. Autonomous regulation of air conditioning	95	25.3	11.6	12.6	17.9
	71	33.8	15.5	16.9	23.9
1.6. Autonomous regulation of heating systems	95	9.5	13.7	16.8	28.4
	81	11.1	16.0	19.8	33.3
1.7. Use of suspension mode for computers and other equipment	95	14.7	8.4	29.5	22.1
	84	16.7	9.5	33.3	25.0
1.8. Use of natural light as long as possible	95	9.5	5.3	29.5	32.6
	84	10.7	6.0	33.3	36.9
1.9. Turning lights on/off in different places according to use patterns	95	8.4	6.3	37.9	26.3
	86	9.3	7.0	41.9	29.1
1.10. Use of recycled paper	95	7.4	13.7	36.8	23.2
	85	8.2	15.3	41.2	25.9
1.11. Invitation not to print emails	95	13.7	5.3	33.7	25.3
	81	16.0	6.2	39.5	29.6
1.12. Printing documents only when necessary	95	11.6	4.2	37.9	28.4
	84	13.1	4.8	42.9	32.1
1.13. Use of energy saving options in printing (draft, 2 pages per paper, two-sides)	95	10.5	10.5	34.7	26.3
	84	11.9	11.9	39.3	29.8
1.14. Use of email more than of regular mail	95	7.4	-	12.6	43.2
	85	8.2	-	14.1	48.2
1.15. Established online procedures (forms etc.)	95	9.5	3.2	15.8	45.3
	83	10.8	3.6	18.1	51.8
1.16. Do you receive information on computerized techniques to reduce paper consumption? (e.g.: sending PDF documents instead of printed ones)	95	15.8	18.9	25.3	21.1
	85	17.6	21.2	28.2	23.5
1.17. Efficient systems of water use (tanks, faucets ...)	95	16.8	7.4	29.5	25.3
	84	19.0	8.3	33.3	28.6
1.18. Reduce use of packaging	95	31.6	5.3	22.1	21.1
	81	37.0	6.2	25.9	24.7
1.19. Use of public water providers	95	15.8	11.6	27.4	24.2
	81	18.5	13.6	32.1	28.4

Main barriers and drivers to becoming involved in responsible energy and materials consumption

Items 1.20 and 1.21 consist of open-ended questions regarding barriers and drivers to becoming involved in responsible practices within the organization (see Table 2.7d).

Table 2.7.d.- Perceived barriers and drivers to performing sustainable practices in the area of consumption of materials and energy

1.20. Please list main barriers and obstacles in performing actions related to the responsible consumption of energy and other resources	PLEASE, USE THIS SPACE TO DESCRIBE THEM
1.21. Please list main drivers which you think would favor responsible environmental action in energy and resource consumption	PLEASE, USE THIS SPACE TO DESCRIBE THEM

Barriers regarding consumption

We have established a system of categories in order to analyse and group the information provided by the key informers in response to these questions. The resulting categories are: a) Absence of an environmental strategy; b) low level of technology; c) Lack of financial and technological resources; d) Financial cost; e) inadequate infrastructure; f) lack of awareness; g) lack of education; h) lack of information; i) lack of incentives and j) others.

The percentages obtained for each category are presented below. The category with the highest percentage is “the lack of environmental awareness”, which was seen as the main barrier to a sustainable organization (24, 5 %); the second highest percentage corresponds to the category of “Inadequate infrastructure” (20,4 %) which would allow the performance of sustainable practices (see Table 2.7e).

Table 2.7e.- Perceived barriers to consumption: Lack of awareness and inadequate infrastructure

		Frequency	Percentage	Valid %	Cumulative %
Valid	Absence of an environmental strategy	2	2,1	4,1	4,1
	Low level of technology	1	1,1	2,0	6,1
	Lack of financial and technological resources	3	3,2	6,1	12,2
	Financial cost	7	7,4	14,3	26,5
	Inadequate infrastructure	10	10,5	20,4	46,9
	Lack of awareness	12	12,6	24,5	71,4
	Lack of education	1	1,1	2,0	73,5
	Lack of information	7	7,4	14,3	87,8
	Lack of incentives	1	1,1	2,0	89,8
	Others	5	5,3	10,2	100,0
	Total	49	51,6	100,0	
Lost values	System	46	48,4		
Total		95	100,0		

2.3.2.5.1 Drivers to sustainable consumption

We also built a system of categories in order to analyze drivers produced by the sample. The resulting categories are: a) installation of infrastructures; b) process automation; c) environmental awareness; d) information on costs of consumption; e) environmental education; f) incentives for saving and financial support for environmental initiatives; g) information and communication; h) feedback and environmental policy implementation; i) others.

The category with the highest percentage of responses is “the installation of appropriate infrastructure” (20 %), followed by “information and communication” (18 %), which should help motivate responsible consumption (see Table 2.7f).

Table 2.7f.- Perceived drivers to consumption: Installing infrastructures and promoting information and communication.

		Frequency	Percentage	Valid %	Cumulative %
Valid	Installation of infrastructure	10	10,5	20,0	20,0
	Process automation	4	4,2	8,0	28,0
	Environmental awareness	5	5,3	10,0	38,0
	Information on costs of consumption (<i>feedback</i>)	3	3,2	6,0	44,0
	Environmental education	3	3,2	6,0	50,0
	Incentives for saving and financial support for environmental initiatives	3	3,2	6,0	56,0
	Information and communication	9	9,5	18,0	74,0
	Feedback and environmental policy implementation	4	4,2	8,0	82,0
	Others	9	9,5	18,0	100,0
	Total	50	52,6	100,0	
Lost values	System	45	47,4		
Total		95	100,0		

2.3.2.4 Waste management practices in the University of Corunna

In this section, we will present the results obtained on waste management practices at home and in the workplace.

Waste management practices at home

When asked about the types of practices that they have changed in the last three years in their management of household waste, respondents say they have made changes in their recycling and separation practices and in reducing the use of plastic. The majority say they have made changes in the recycling/separation of waste (77,4%), followed by reductions in the use of plastic materials at home (58,9%).

But when it comes to the conservation for reutilization, it turns out that the majority (43,5 %) has not taken any measures. The measures introduced at home to manage waste more sustainably are less than the ones taken to save energy, water or paper (see Figure 2.10).

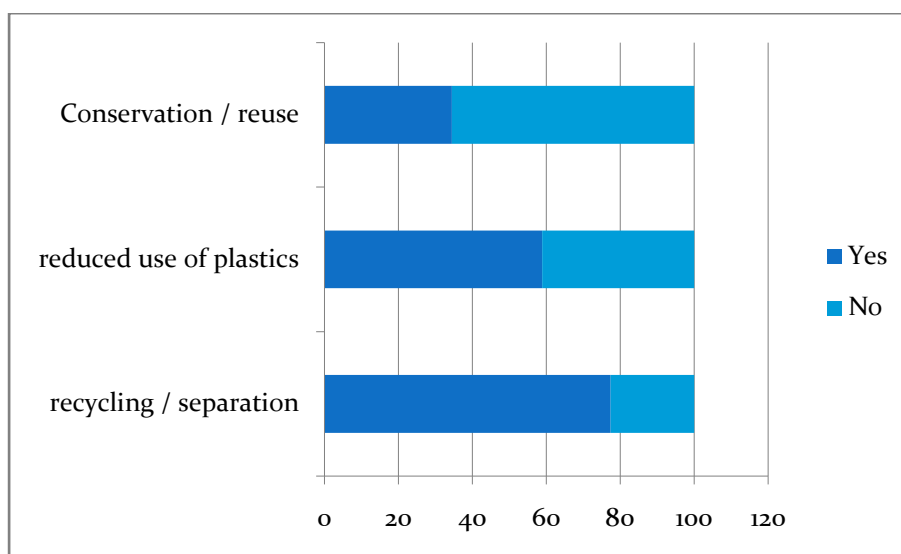


Figure 2.10. Percentage of measures introduced in the household to ensure a more sustainable waste management

The qualitative response regarding this issue has provided us with the following information:

- a. The measures adopted in the area of waste separation and recycling refer mainly to:
 - The separation of waste for recycling.
 - Other sporadically implemented practices such as: avoid throwing away used oil in the sink and using organic waste in ecologic vegetable garden?
- b. The practices implemented in the last three years in the area of plastic use reduction are:
 - The re-use of plastic bags for waste
 - Taking own bags to the supermarket.
 - The use of cloth bags.
 - The use of ecologic bags(potato starch).
 - Other sporadic ally implemented practices such as: not using bags when buying just a few items, buying ashopping trolley, not buy products with double packaging or the use of glass recipients instead of plastic ones.
- c. In the area of conservation for reutilization, the specific adopted measures are few and sporadic: repairing broken items at home, keeping recipients for other uses (glass, paper boxes, newspapers...), or giving clothes to charity organizations.

Waste management practices in the workplace

Table 2.8a shows the situation of waste-related practices observed by the key infomers in the workplace.

As we can easily observe, the response patterns show that items can be grouped in two categories. One category comprises items 2.1 to 2.4. For these items the majority of respondents (between 80 % and 96 %) consider that these practices are performed “Many times” and “Always”. These items refer to practices that are easily observed and well-known by the staff members: the separation and recycling of paper, toner or batteries. The second category comprises items 2.5 to 2.8 which refer to waste management practices that are not under the control of the university, and are performed by

external service providers contracted by the university: recycling of organic products, regeneration of glass waste, vending machine products.

Responses in the category of “Don’t know/NA” range from 12,5 % to 30,1 %”; responses in the category of “does not exist” range from 14,1 % and 36,1 %. These results reflect the lack of knowledge regarding waste management practices in the organization.

Table 2.8a.- Perception of practices related to waste generation and management in the university

	N	(a) Practices you have observed				
		Don't know/NA	Does not exist	Sometimes	Many times	Always
2.1. Recycling of printed paper	95	-	7.4	14.7	47.4	28.4
	93	-	7.5	15.1	48.4	29.0
2.2. Waste separation for paper	95	3.2	11.6	9.5	46.3	25.3
	91	3.3	12.1	9.9	48.4	26.4
2.3. Waste separation for used toners	95	1.1	4.2	1.1	20.0	71.6
	93	1.1	4.3	1.1	20.4	73.1
2.4. Waste separation for batteries	95	-	2.1	6.3	22.1	62.1
	88	-	2.3	6.8	23.9	67.0
2.5. Recycling of organic products (oil and other)	95	26.3	31.6	13.7	8.4	7.4
	83	30.1	36.1	15.7	9.6	8.4
2.6. Waste generation due to packed or imported food products	95	21.1	27.4	25.3	14.7	3.2
	87	23.0	29.9	27.6	16.1	3.4
2.7. Use of glass in restaurant and cafeterias or vending machines	95	11.6	18.9	24.2	30.5	7.4
	88	12.5	20.5	26.1	33.0	8.0
2.8. Use of plastic in organizational materials (documents, folders for meeting...)	95	-	12.6	42.1	24.2	-
	85	-	14.1	47.1	27.1	-

Perceived importance that the University concedes to waste-management practices

Table 2.8b presents the results on the perceived importance attributed by the university to different waste management practices. The same pattern of response as in table 2.8a is visible here. Nevertheless, the percentage of respondents choosing the option “Don’t know/NA” is higher (between 26,7 % and 50,7 %), showing a very low level of dissemination of the measures and policies implemented by the university. The percentage of response is also high in the category “None” (19 % to 26 %).

Table 2.8b. - Perception of the importance accorded by the university to practices related to waste generation and management

	(b) Importance conceded by this University					
	N	Don't know/NA	None	A little	Quite a lot	A lot
2.1. Recycling of printed paper	95	9.5	16.8	26.3	24.2	13.7
	86	10.5	18.6	29.1	26.7	15.1
2.2. Waste separation for paper	95	7.4	10.5	23.2	30.5	15.8
	83	8.4	12.0	26.5	34.9	18.1
2.3. Waste separation for used toners	95	4.2	2.1	12.6	33.7	35.8
	84	4.8	2.4	14.3	38.1	40.5
2.4. Waste separation for batteries	95	6.3	3.2	12.6	29.5	30.5
	78	7.7	3.8	15.4	35.9	37.2
2.5. Recycling of organic products (oil and other)	95	36.8	14.7	11.6	10.5	3.2
	73	47.9	19.2	15.1	13.7	4.1
2.6. Waste generation due to packed or imported food products	95	38.9	20.0	13.7	3.2	1.1
	73	50.7	26.0	17.8	4.1	1.4
2.7. Use of glass in restaurant and cafeterias or vending machines	95	27.4	15.8	23.2	12.6	4.2
	79	32.9	19.0	27.8	15.2	5.1
2.8. Use of plastic in organizational materials (documents, folders for meeting...)	95	21.1	16.8	28.4	10.5	1.1
	75	26.7	21.3	36.0	13.3	1.3

Perceived importance that the workers concede to waste-management practices

Table 2.8c shows the results for the perceived importance of waste-related practices as conceded by the workers of the university. Responses still show a division of items in two distinct blocs, but response patterns are different than in the previous categories. Thus, the first bloc comprises the same items 2.1 to 2.4, but also items 2.7 and 2.8, that were not part of the first bloc in the previous two tables. The answers to the items of this bloc are concentrated in the categories of “Quite a lot” and “A lot”. Item 2.7 presents a high rate of “Don’t know/NA” answers (26,3 %) which might mean that when responding people were thinking of their own behavior rather than of the importance accorded by workers in general to the use of glass in vending machines or cafeterias. This is also the case with the item referring to the use of plastic in organizational materials (18,3 %).

Table 2.8c.- Perception of the importance accorded by the workers to different practices related to waste generation and management (the first line indicates percentages for the whole sample, while the second indicates percentages without the missing values. The blue color in item 2.7 shows high percentages can be found on both sides of the scale)

	(c) Importance assigned by workers of this University					
	N	Don't know/NA	None	A little	Quite a lot	A lot
2.1. Recycling of printed paper	95	2.1	2.1	28.4	36.8	15.8
	81	2.5	2.5	33.3	43.2	18.5
2.2. Waste separation for paper	95	7.4	4.2	15.8	40.0	15.8
	79	8.9	5.1	19.0	48.1	19.0
2.3. Waste separation for used toners	95	1.1	2.1	6.3	37.9	37.9
	81	1.2	2.5	7.4	44.4	44.4
2.4. Waste separation for batteries	95	1.1	1.1	10.5	31.6	33.7
	74	1.4	1.4	13.5	40.5	43.2
2.5. Recycling of organic products (oil and other)	95	35.8	10.5	9.5	13.7	3.2
	69	49.3	14.5	13.0	18.8	4.3
2.6. Waste generation due to packed or imported food products	95	34.7	10.5	17.9	10.5	3.2
	73	45.2	13.7	23.3	13.7	4.1
2.7. Use of glass in restaurant and cafeterias or vending machines	95	21.1	11.6	26.3	14.7	6.3
	76	26.3	14.5	32.9	18.4	7.9
2.8. Use of plastic in organizational materials (documents, folders for meeting...)	95	13.7	11.6	28.4	17.9	3.2
	71	18.3	15.5	38.0	23.9	4.2

Main perceived barriers and drivers in adopting sustainable waste-management practices

A qualitative measure was obtained from the Items 2.9 and 2.10. These open items asked the respondent for a list of perceived barriers and drivers for the environmental action regarding waste (see Table 2.8d).

Table 2.8d.- Qualitative items for measuring the perception of the key-informant about the perceived barriers and obstacles to performance of environmental actions in the University, as well as the perceived drivers for favor responsible environmental action regarding waste.

2.9. Please list main barriers and obstacles in performing actions related to the waste	PLEASE, USE THIS SPACE FOR DESCRIBE THEM
2.10. Please list main drivers which you think would favor responsible environmental actions related to waste.	PLEASE, USE THIS SPACE FOR DESCRIBE THEM

Main perceived barriers to adopting sustainable waste-management practices

Another system of nine categories was built to organize responses. The resulting categories were: a) Lack of communication; b) Absence of glass recipients in the vending machines; c) Lack of personnel motivation; d) Lack of education; e) Lack of environmental awareness; f) Lack of infrastructure; g) Lack of environmental policy; h) Lack of adequate waste bins; i) other.

The lack of adequate waste bins was considered the main barrier to adopting sustainable waste practices (32,60 % of the sample). The second most mentioned barrier was the lack of communication (18,6%), and, finally, the lack of environmental awareness (16,3 %) was the third most mentioned barrier. (See Table 2.8e)

Table 2.8e.- Perceived barriers in management of waste: Inadequate infrastructure and lack of awareness.

		Frequency	Percentage	Valid %	Cumulative %
Valid	Lack of Communications	8	8,4	18,6	18,6
	Absence of glass recipients in the vending machines	3	3,2	7,0	25,6
	Lack of personnel motivation	1	1,1	2,3	27,9
	Lack of education	2	2,1	4,7	32,6
	Lack of environmental awareness	7	7,4	16,3	48,8
	Lack of infrastructure	4	4,2	9,3	58,1
	Lack of an environmental policy	1	1,1	2,3	60,5
	Lack of adequate waste bins	14	14,7	32,6	93,0
	Other	3	3,2	7,0	100,0
	Total	43	45,3	100,0	
Lost values	System	52	54,7		
Total		95	100,0		

Main perceived drivers in adopting sustainable waste-management practices

For the mentioned drivers, we again obtained a system of categories from the responses the subjects provided. These were: a) Accessibility of waste bins; b) Environmental awareness; c) Reinforcing/adopting an environmental policy; d) Environmental education; e) Providing incentives for recycling / re-using; f) providing information; g) Providing adequate infrastructure; h) Promoting automation of procedures; i) Other.

Providing information on how to manage and recycle waste is considered the main driver for developing sustainable waste practices (32,60%). Waste bins accessibility accounts for 21,70 % of the answers (See table 2.8f).

Table 2.8f. - Perceived drivers for promoting a responsible behaviour regarding management of waste: Accessibility to waste containers, and Information and facilitation.

		Frequency	Percentage	Valid %	Cumulative %
Valid	Accessibility of waste bins	10	10,5	21,7	21,7
	Environmental awareness	4	4,2	8,7	30,4
	Reinforcing / Adopting an environmental policy	4	4,2	8,7	39,1
	Environmental education	2	2,1	4,3	43,5
	Providing incentives for recycling / re-using	3	3,2	6,5	50,0
	Providing information	15	15,8	32,6	82,6
	Providing adequate infrastructure	1	1,1	2,2	84,8
	Promoting automation of procedures	1	1,1	2,2	87,0
	Other	6	6,3	13,0	100,0
	Total	46	48,4	100,0	
Lost values	System	49	51,6		
Total		95	100,0		

2.3.2.6 Workplace mobility practices in the UDC

Again, we will first present results related to mobility patterns outside of work, and then the results on practices of work-related mobility.

Mobility practices outside of work

In the area of mobility, our results show that respondents have introduced changes in the last three years in one of the mentioned practices. 54,9 % say they now walk more instead of using the car. We can see that changes in mobility are much less than changes in energy consumption and waste management, showing the low importance given to this set of practices, a key one for sustainability (see Figure 2.11).

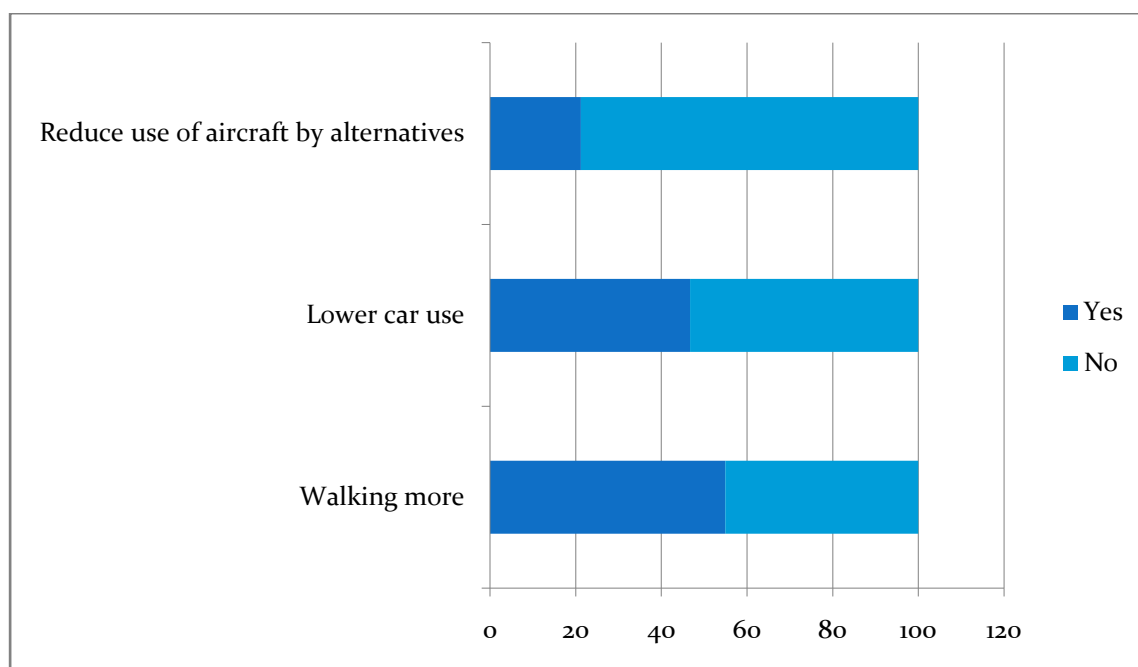


Figure 2.11. Percentage of measures to transport and mobility

When analyzing the qualitative response, we find the following perceptions:

When referring to walking more than using the car, the specific adopted measures were:

- Using the car only for large distances (the majority of people interviewed say they do not use the car for distances requiring less than half an hour/forty minutes) or that they do not use it in the city or in their residential neighbourhood.
- Other sporadic measures include: buying products in small quantities from shops and walking there, instead of buying lots of products and travelling to the supermarket by car, walking when it does not rain, walking to work or walking in their free time.

When referring to using the car less, few people mention having taken any measures at all, and when they do, these are sporadic: using the bus, motorcycle or bicycle, not having a car or having one car per family, car sharing between family and friends.

Finally, when referring to the reduction of airplane travel, the specific adopted measures mentioned by the participants are again sporadic and refer only to the use of other travel means such as the train, the car or the bus.

Practices related to mobility in the UDC

Table 2.9a shows the perceived mobility practices in the workplace. For most items, answers are grouped in the categories of “Does not exist” and “Sometimes”. At a closer look, we can see that items 3.1 and 3.2 have high percentages of responses in the category of “Sometimes” (52,7 % and 53,3 %) which indicate the fact that sometimes university members do use video or e-conferences or use public transport to move between home and work. Item 3.3 shows there is no carpooling at the UDC. The university does not have a shuttle system and the organizational car fleet is only composed of vehicles for the internal mail service or for the Rector’s office.

In the case of walking or cycling, we can observe a high percentage of responses in the category: “Does not exist” (42,4) but also a relatively high percentage in the category of “Sometimes” (39,1 %), showing a mixed picture of bicycle use and of walking as an everyday practice in the workplace.

Finally, the high percentage of respondents saying that work-related airplane travel is used “sometimes” or “many times” (73 %) is reasonable and motivated by the lack of efficient large-distance alternative travel modalities (high-velocity trains, for example).

Table 2.9a. - Perception of *travel-related practices* for workplace activities (the first line indicates percentages for the whole sample, while the second indicates percentages without the missing values. The blue color in items 3.4 and 3.5 shows that high percentages can be found both in the ‘Don’t know/NA’ and in the ‘Does not exist’ category)

	(a) Practices you have observed					
	N	Don't know/NA	Does not exist	Sometimes	Many times	Always
3.1. Use of video and e-conferences with colleagues from distant places	95	5.3	27.4	50.5	9.5	3.2
	91	5.5	28.6	52.7	9.9	3.3
3.2. Use of public transport to go to work (train, bus...)	95	2.1	27.4	51.6	10.5	5.3
	92	2.2	28.3	53.3	10.9	5.4
3.3. Car-sharing to go to work	95	6.3	49.5	28.4	5.3	3.2
	88	6.8	53.4	30.7	5.7	3.4
3.4. Shuttle service provided by UDC	95	27.4	46.3	4.2	-	-
	74	35.1	59.5	5.4	-	-
3.5. Organizational car fleet with methane or electric engine	95	26.3	63.2	1.1	-	-
	86	29.1	69.8	1.2	-	-
3.6. Walking or cycling	95	6.3	41.1	37.9	5.3	6.3
	92	6.5	42.4	39.1	5.4	6.5
3.7. Work-related airplane travel	95	9.5	17.9	34.7	28.4	3.2
	89	10.1	19.1	37.1	30.3	3.4

Perceived importance that the University concedes to the work-related mobility practices

Table 2.9b shows the perception of the importance accorded by the university to specific travel-related practices. the dominant perception is that there are no university policies targeting transport patterns. The only items perceived positively are the ones already mentioned above: 3.1, 3.2, and 3.6).

Table 2.9b.- Perception of the importance accorded by the university to *travel-related practices* for workplace activities (the first line indicates percentages for the whole sample, while the second indicates percentages without the missing values. The blue color in items 3.1, 3.2 and 3.6 shows high percentages can be found on both sides of the scale)

	N	(b) Importance conceded by this University				
		Don't know/NA	None	A little	Quite a lot	A lot
3.1. Use of video and e-conferences with colleagues from distant places	95 81	10.5 12.3	18.9 22.2	41.1 48.1	12.6 14.8	2.1 2.5
3.2. Use of public transport to go to work (train, bus...)	95 80	10.5 12.5	21.1 25.0	32.6 38.8	17.9 21.3	2.1 2.5
3.3. Car-sharing to go to work	95 76	21.1 26.3	40.0 50.0	15.8 19.7	3.2 3.9	- -
3.3.bis. How many people sharing a car with you	95 41	22.1 51.2	12.6 29.3	5.3 12.2	3.2 7.3	- -
3.4. Shuttle service provided by UDC	95 63	28.4 42.9	33.7 50.8	2.1 3.2	2.1 3.2	- -
3.5. Organizational car fleet with methane or electric engine	95 74	31.6 40.5	45.3 58.1	1.1 1.4	- -	- -
3.6. Walking or cycling	95 76	10.5 13.2	18.9 23.7	32.6 40.8	14.7 18.4	3.2 3.9
3.7. Work-related airplane travel	95 72	28.4 37.5	17.9 23.6	14.7 19.4	11.6 15.3	3.2 4.2

Perceived importance the workers concede to work-related mobility practices

Table 2.9c shows results on the perceived importance accorded by workers to specific travel practices. We find a high level of “Don’t know/NA” answers at items 3.3, 3.4 and 3.5 and a positive tendency of response in items 3.1, 3.2, 3.6, and 3.7. For this last item, it seems the sample is almost equally divided between the first two categories of response on the one hand, and the last two, on the other.

Table 2.9c.- Perception of the importance accorded by the workers to *travel-related practices* for workplace activities (the first line indicates percentages for the whole sample, while the second indicates percentages without the missing values. The blue color in items 3.3 and 3.7 shows high percentages can be found on both sides of the scale)

	N	(c) Importance assigned by workers of this University				
		Don't know/NA	None	A little	Quite a lot	A lot
3.1. Use of video and e-conferences with colleagues from distant places	95 75	13.7 17.3	10.5 13.3	32.6 41.3	18.9 24.0	3.2 4.0
3.2. Use of public transport to go to work (train, bus...)	95 76	6.3 7.9	10.5 13.2	43.2 53.9	15.8 19.7	4.2 5.3
3.3. Car-sharing to go to work	95 74	13.7 17.6	23.2 29.7	32.6 41.9	6.3 8.1	2.1 2.7
3.3.bis. How many people sharing a car with you	95 39	18.9 46.2	7.4 17.9	8.4 20.5	5.3 12.8	1.1 2.6
3.4. Shuttle service provided by UDC	95 58	30.5 50.0	15.8 25.9	6.3 10.3	5.3 8.6	3.2 5.2
3.5. Organizational car fleet with methane or electric engine	95 65	29.5 43.1	28.4 41.5	7.4 10.8	2.1 3.1	1.1 1.5
3.6. Walking or cycling	95 73	9.5 12.3	18.9 24.7	34.7 45.2	11.6 15.1	2.1 2.7
3.7. Work-related airplane travel	95 71	22.1 29.6	13.7 18.3	17.9 23.9	17.9 23.9	3.2 4.2

Main barriers and drivers to adopting sustainable mobility practices

A qualitative measure was also obtained from the Items 3.8 and 3.9. These open items asked the respondent for a list of perceived barriers and drivers for the environmental action regarding work-related travel (see Table 2.9d).

Table 2.9d.- Qualitative items for measuring the perception of the key-informant about the perceived barriers in adopting responsible travel behavior in the University, as well as the perceived ondrivers for favor responsible environmental behavior in work-related travel.

3.8. Please list main barriers in adopting responsible travel behaviour.	PLEASE, USE THIS SPACE FOR DESCRIBE THEM
3.9. Please list main drivers which you think would favor responsible environmental behavior in work-related travel	PLEASE, USE THIS SPACE FOR DESCRIBE THEM

Main perceived barriers to adopting sustainable mobility practices

The resulting categories for the perceived barriers to adopting sustainable mobility practices were: a) Having access to other means of transportation; b) Lack of sufficient public transport lines; c) Lack of an organizational transport policy; d) Low environmental awareness; e) Climate barriers; f) insufficient public transport connecting nodes; g) Commodity; h) Inadequate schedules; i) Inadequate public transport; j) Other.

The categories with most responses were: insufficient public transport connection nodes (21,40 %) and inadequate public transport (16,10 %) (see table 2.9e).

Table 2.9e.- Perceived barriers in mobility: Insufficient connections; and inadequate public transport

		Frequency	Percentage	Valid %	Cumulative %
Valid	Having access to other means of transportation	6	6,3	10,7	10,7
	Lack of sufficient public transport lines	7	7,4	12,5	23,2
	Lack of an organizational transport policy	2	2,1	3,6	26,8
	Low environmental awareness	3	3,2	5,4	32,1
	Climate barriers	1	1,1	1,8	33,9
	Insufficient public transport connecting nodes	12	12,6	21,4	55,4
	Commodity	4	4,2	7,1	62,5
	Inadequate schedules	7	7,4	12,5	75,0
	Inadequate public transport	9	9,5	16,1	91,1
	Other	5	5,3	8,9	100,0
	Total	56	58,9	100,0	
Lost values	System	39	41,1		
Total		95	100,0		

Main perceived drivers to adopting sustainable mobility practices

The resulting categories for the drivers to adopting sustainable mobility practices were: a) Reinforcement/adoption of an environmental policy; b) Increasing connecting nodes for public transport; c) Promoting car pooling; d) Designing new infrastructure; e) Education and environmental awareness; f) Improving connections and infrastructure; g) Deterrent solutions; h) Promoting the use of metro and bus lane; i) Normative solutions; j) Costs: Free transport and increase of automobile products and fees; k) Other.

The categories with most responses were: improving connections and infrastructures (35,4 %) and the promotion of car pooling (20,8 %) (see table 2.9f).

Table 2.9f.- Perceived drivers in mobility: Improving connections and infrastructures; and Promoting car pooling.

		Frequency	Percentage	Valid %	Cumulative %
Valid	Reinforcement / Adoption of an environmental policy	7	7,4	14,6	14,6
	Increasing connecting nodes for public transport	4	4,2	8,3	22,9
	Promoting car pooling	10	10,5	20,8	43,8
	Designing new infrastructure	2	2,1	4,2	47,9
	Education and environmental awareness	1	1,1	2,1	50,0
	Improving connections and infrastructure	17	17,9	35,4	85,4
	Deterrent solutions	1	1,1	2,1	87,5
	Promoting the use of metro and bus lane	1	1,1	2,1	89,6
	Normative solutions	2	2,1	4,2	93,8
	Costs: free transport and increase of automobile products and fees	2	2,1	4,2	97,9
	Other	1	1,1	2,1	100,0
	Total	48	50,5	100,0	
Lost values	System	47	49,5		
Total		95	100,0		

2.3.3 Conclusion

The second stage of the diagnosis of practices at the UDC allowed us to test a structured measurement tool which proved to be very useful in obtaining information on consumption, waste management and work-related mobility practices at the university, as they were perceived and observed by a number of selected key informers.

Besides the perception of habitual practices in the three areas of interest in LOCAW, key informers were also asked to evaluate the importance they thought the university, on the one hand, conceded to

the different sustainable practices and, on the other hand, the importance the workers attribute to the practices.

Effectiveness of the measurement tool

One of the important risks when using questionnaires is that individuals might answer in the same way to items that are similarly formulated, even when their content is different. Figures 2, 3 and 4 show that subjects interviewed responded differently to each block of items, thus indicating that different instructions were well understood even when referring to the same items. The distribution of items in each of the three Euclidean spaces, generated through multidimensional scaling allows us to draw three further conclusions:

- a) In the area of energy and materials consumption, the observed practices are different in orientation from the perceived importance attributed by the University and the perceived importance attributed by the workers to the practices.
- b) In the area of waste generation and management, the same is true.
- c) Finally, in the area of work-related mobility, observed practices and the perceived importance attributed by the University have similar distributions, but both are very different from the perceived importance attributed by workers.

Knowing the internal criteria used by key informers

Another aspect of interest in this analysis was to identify the internal criteria respondents use in judging the observed environmental practices. The dendograms derived from cluster analysis (Figures 2.5, 2.6 and 2.7) provided interesting information and showed that key informers adequately identified elements and practices over which the workers have personal control, and those over which they do not and which require an organizational strategy. When judging work-related mobility practices, the internal criteria used by the key informers have to do with grouping transport practices into one category having to do with travelling between home and work and a second category grouping travelling practices related to the attendance of academic meetings and conferences outside of one's own university. These two criteria could result in two types of answers depending on the situational context, but also on the quality, availability and cost of infrastructure.

The meaning of sustainable development

Previous studies undertaken by our group (see García-Mira, 2009) have shown that people in general have a very vague idea of what sustainability or sustainable development is. In LOCAW, due to the fact that we selected a university sample, the results were different, as we had originally hypothesized. The majority of people interviewed (76 %) showed a good or very good knowledge of the meaning of sustainability or sustainable development.

Changing behavior at home

Our results have also shown that people had introduced changes in their environmental practices at home in the last three years. Most measures were taken in the area of energy consumption and included: the acquisition of low-energy lamps, reducing the use or intensity of heating systems, or switching off lights and appliances when not in use. With a lower frequency, measures aimed at reducing water and paper consumption were also implemented.

In the area of waste management, key informers say they implemented recycling practices and have reduced their use of plastic. These are the most common changes reported by subjects in this area and are coherent with mass-media campaigns that have focused on these two categories of practices.

Finally, in the area of mobility, the most important change in the last three years refers to walking more and reducing the use of cars for short distances. This change in practices could also be related to the increase in the number of cars and traffic in the city in the last decade on the one hand, and the increase in gas prices on the other.

Analyzing the responses of key informers

The analysis of responses provided by the key informers has confirmed the Euclidean representations presented at the beginning, and derived from multidimensional scaling solutions.

In the area of material and energy consumption, the observed practices in their unit or building are generally considered to be present occasionally or frequently, while the perceived importance the University attributes to these practices is considered inexistent, low, or respondents say they do not know (Tables 2.7a, 2.7b, and 2.7c). The perceived importance attributed by the workers is considered higher (Table 2.7d). The perceived barriers to implementing more sustainable practices in this area are considered to be the lack of environmental awareness and the inadequacy of University infrastructure (Table 2.7e). Key informers propose as drivers for change the construction of more adequate infrastructure and the adoption of an adequate information and communication policy (Table 2.7f). Both these drivers establish the locus of control within the institution itself and not in the individual workers.

In the area of waste generation and management, the perception of observed practices is similar to the perceived importance the University concedes to these practices and the perceived importance workers concede to the practices. The mentioned barriers have to do with the absence of adequate recycle bins, the lack of environmental awareness and the lack of an adequate information and communication policy. Consequently, drivers would have to be providing adequate information to workers about how to recycle and provide an adequate infrastructure with clearly defined, easy-to-read bins.

Finally, in the area of work-related mobility, as we have already mentioned, there are two clear dimensions guiding the responses, which allow us to group the items into two distinct travelling necessities: a) travelling between home and work; and b) travelling to scientific meetings (conferences etc.). The perception is that the University concedes no importance to the issue of sustainable mobility, while workers are perceived both as attributing importance to it and their observed practices sometimes include the use of video or e-conferences and the use of bicycles or public transport systems. Barriers to the use of public transport are considered to be the insufficiency of lines of transport and connecting nodes and the inadequacy of the existing transport system. The mentioned drivers are: the improvement of connections and infrastructures, which is consistent with the mentioned barriers; and the promotion of carpooling among workers and students.

2.4 Focus groups

2.4.1 Introduction

A *Focus Group* is a social situation where people discuss issues concerning their own experience. Focus groups have the objectives of collecting information, points of view, opinions and meanings about a specific object of interest. Focus groups are powerful instruments which provide useful information in addition to the one obtained via other methods such as surveys.

In the context of this work package, focus groups aimed at identifying perceptions, attitudes, beliefs, and everyday practices regarding the three key dimensions of LOCAW: consumption, waste, and organization-related mobility.

2.4.2 Organization and management of the focus groups

2.4.2.1 Method

In order to make an in-depth diagnosis of existing practices in the organization and of barriers and drivers to sustainability, we decided to do two focus groups, in the two main campuses of the University of Corunna, situated in two distinct locations: the Campus of Elviña, situated in the urban area of the city of Corunna; and the Campus of Ferrol, situated in the urban area of the city of Ferrol. Each focus group lasted 1 and half hours and was coordinated by one of the senior team members and an assistant. The composition of the focus group was designed to ensure that all categories of university members were represented. Thus members of each focus group included students, academic staff (PDI), administrative staff (PAS), people occupying leadership positions related to the environmental aspects of the organization and people representing unions within the organization.

Both focus groups were audio-taped and then analyzed using ATLAS.ti. Both audio documents were analyzed and quotations were determined, to which codes were assigned. Each code was defined using the structure: “*Conceptual area_specific team*”. The conceptual areas defined were:

1. Attitudes (evaluations made by the subjects on different aspects of the organization, related to the dimensions studied within LOCAW – consumption of resources and energy; waste management; and organization-related mobility)
2. Barriers (perceived obstacles in transforming the organization into a more sustainable one and reducing GHG emissions)
3. Best practices (perception of the existing everyday practices in the organization. This category was designed to include all practices perceived as being present in the organization – both positive and negative)
4. Responsibility assignment (attributions of responsibility for the existing situation within the organization)
5. Values (perception of existing environmentally-relevant values within the organization and in the larger society; also includes observations about missing values, that would positively influence everyday practices related to sustainability).

After defining the codes, families of codes were constructed for each conceptual area. Each code in the family was assigned a color, to represent a specific dimension of the situational analysis proposed within Deliverable 2.1. Thus, **grey** was assigned to *Major contested issues/popular and other discourses*; **black** was assigned to *Material elements/physical, structural*; **pink** to *Individual and collective human elements*; **blue** to *Political economic and institutional elements*; **green** to *Discursive constructions of actors*; **brown** to *Other empirical elements*; **violet** to *Spatial and temporal elements*; **orange** to *Socio-cultural elements* and **beige** to *Organizational and institutional elements*.

Two researchers separately coded the primary documents and then discussed and reached agreements on those codes that were different in meaning.

2.4.2.2 Results

Attitudes regarding sustainability-related practices in the organization

In what concerns attitudes, the general orientation is that there are lots of things that can be improved within the University and discussion themes center on the causes of unsustainable behavior. A general conceptual network concerning the dimension of attitudes is provided in figure 2.12. In this, people refer to causes pertaining to the individual and causes related to the organization. In the category of individual causes, university members consider that commodity and personal cost are the most important factors affecting unsustainable behavior in the workplace. The code *“Causes of unsustainable behavior are related to commodity and personal cost”* has the highest number of associated quotations in this family (13 associated quotations) and a density of 3 (the number of links that connect this code to other codes). Commodity refers to the effort needed to perform a certain behavior and personal cost makes reference to the economic dimension of behavior. That is, members of the university consider that behavior in the workplace is less sustainable than behavior at home, because unsustainable behavior has no financial consequences at work, while at home it is reflected into a higher level of spending. The only other individual-level factor mentioned is: *“Resistance in elderly staff to learn new technologies”* (4-2):

Another signalled theme has to do with causes of unsustainable behavior that are related to organizational decisions. These are expressed as measures that the university could take to ensure a reduction of CO₂ emissions, and they refer mostly to physical/structural factors such as changing the way activities are performed within the university (such as classes or participation at conference) by *“Promoting the use of information technology to reduce mobility”* (5-1), or *“Need for a change in heating systems to avoid waste”* (3-1). In general, the perception is that the university is not doing enough in terms of sustainability, and this is expressed in the code *“Existing measures are not sufficient”* (3-2).

Another body of content in this family of codes refers to the interaction between top-down decisions and organizational context elements on the one hand, and the individual on the other. Thus, it is considered that existing practices are a result of the interaction between top-down conditions and individual behavior (*“Practices are dependent on interaction between top-down conditions and individual behavior within them”*) and that responsibility for change belongs both to the university as an institution and to individual members (*“Shared responsibility between university’s government and individual users”*). The last code has 3 quotations associated to it and a density of 1. On a deeper level of analysis, we can observe that in spite of the observation that practices are a result of the interaction between contextual conditions and individual factors determining sustainable behavior, responsibility is mainly attributed to the university as an institution: more codes refer to what the organization could do than what the individuals within it could change in their behavior: *“Sustainable solutions should be provided by using existing internal resources”* (1-1); *“Small measures for significant improvement”* (2-1); *“Necessity to educate elderly staff in the use of moodle platforms and other technologies”* (2-1). This is also suggested by indicating that individuals do hold pro-environmental attitudes but they do not get translated into practice within the organization (*“Pro-environmental attitudes are individual and not translated into institutional practices”* – 1-1).

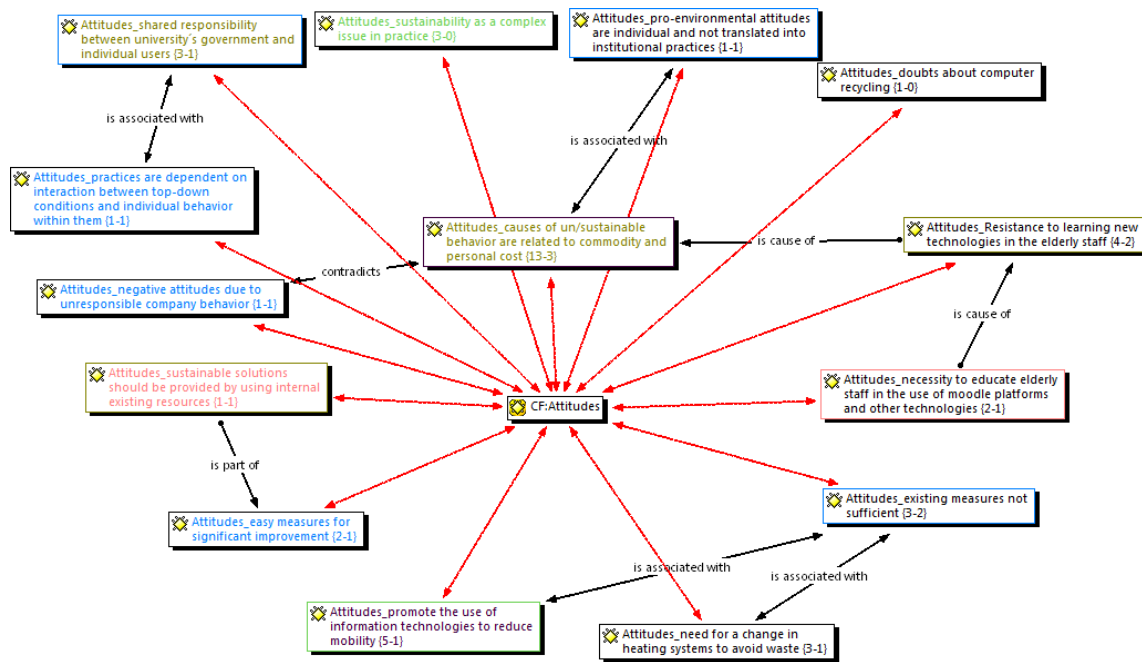


Figure 2.12. Conceptual network of attitudes

Values influencing un/sustainable practices in the university

One of the emerging themes in this category is related to the conflict of values that affects sustainable practices. A general conceptual network concerning the dimension of values is provided in figure 2.13. In the area of work-related mobility, one of the highest impact activities of university members is participation in conferences. Although there are several ways in which this can be reduced, such as organizing virtual meetings or reducing the number of conferences attended by using criteria of relevance to one's own work and objectives, transforming these into practice is difficult because there are two values coming into conflict: pro-environmental values and the value of direct contact with other professionals of one's academic field, which ensures opportunities for collaborations in research and other academic projects.

Another theme refers to the values that constitute a barrier to the implementing of sustainable practices. The societal value of consumerism is mentioned as an obstacle ("Consumerism as a barrier to sustainability"), which is translated at the organizational level into valuing immediate economic gain and using performance measures based on profit and not on sustainability. This results in avoiding decisions that require high investment and have a delayed return in economic terms, such as investments in infrastructure.

It is signaled that the university as an organization has the right values and that "organizational sensibility with sustainability" (4-2) exists. Nevertheless, in order for individuals to adopt practices that lead to a reduction of CO₂ emissions and to develop pro-environmental values, education and awareness are considered very important. The code "Importance of environmental education and awareness" has the highest numbers of quotations associated to it in this family (18 quotations).

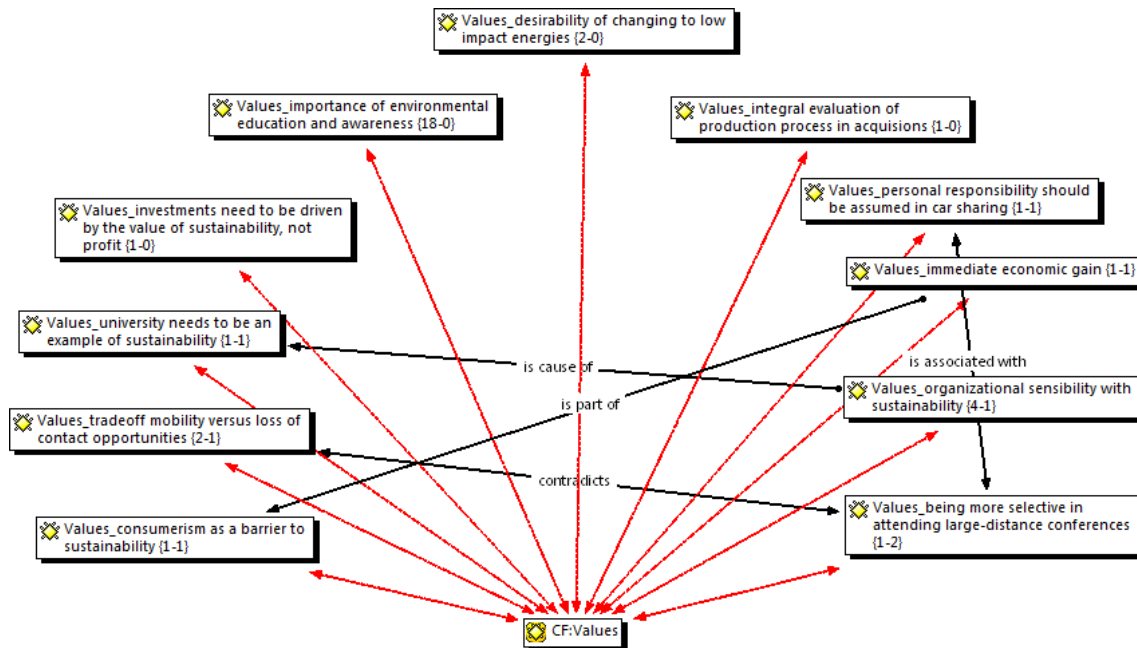


Figure 2.13. Conceptual network of values

Diagnosis of practices in the organization

The general perception of practices within the organization is that there have been advances in terms of sustainability but also that there are still a lot of things that are missing or are inappropriate for the environment. A general conceptual network concerning the dimension of practices is provided in figure 2.14.

Among the good practices, in the *area of energy and resource consumption*, the following are mentioned: “Fast intervention in case of water escapes” (2-1); “Circuit for re-use of grey waters using biomass energy” (1-1); “Low-consumption light bulbs” (1-1); “Paper consumption is being reduced” (3-0); “Internal notifications via email” (1-1); “Exams use recycled paper” (1-1). *In the area of organization-related mobility*, among the good practices we find: “Bicycle introduction was successful” (2-1); “Campus transport significantly improved in the last years” (1-1). Waste is not mentioned here and the most likely explanation for this omission is that waste management is externalized in the university and it is handled by an independent company. It is likely that practices related to waste are not perceived as being part of the university or that there is less knowledge about how this is handled and what practices exist in this area.

We can observe that the number of quotations in these codes is very low and many of them are mentioned just by one or two people in the focus group, either the representative of management or the unionist. This is consistent with the fact that sustainable practices in the university, even where they exist, are not perceived by university members. This might mean that sustainability-related policy is not well communicated in the university and thus it is difficult to create a pro-environmental culture in the organization and to promote sustainable individual behavior in the workplace.

Among the practices considered unsustainable or missing, the following were mentioned: “Abusive use of lights” (1-6); “Blinds are kept down” (1-1); “Lack of centralized energy switch-off at night” (1-1); the suggestion to “introduce light switching on and off with sensors” (2-1); and “low paper re-use” (2-1). We can observe that all of them belong to the area of energy and resource consumption and focus mainly on energy use.

The area where most advances are visible for university members is in reducing the consumption of paper due to the introduction of computerized procedures in academic and administrative activities in the university. Being skilled in managing technology is considered a characteristic of academic staff and it is mentioned as a driver in achieving a higher degree of reduction of resource use. The code “Academic staff is skilled in using technology with students” belongs to the dimension of *Individual and collective human elements*, according to the Situational Analysis.

Also, there is recognition of the fact that some practices depend on the coordination and cooperation between the university and other external institutions, especially in the area of sustainable transport.

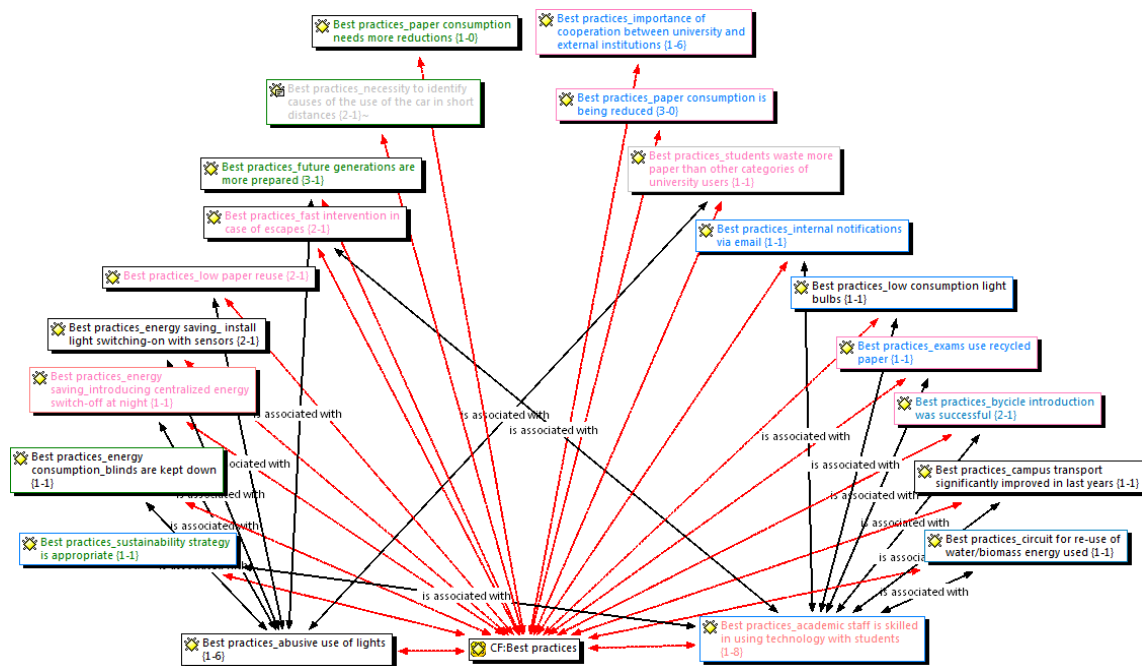


Figure 2.14. Conceptual network of practices

Responsibility attribution for the existing practices

When the situation in the organization is analyzed, members attribute responsibility for the existing unsustainable practices mostly to the organization and to external factors and institutions, and there is almost no reference to individual responsibility of agents within the university. A general conceptual network concerning the dimension of responsibility is provided in figure 2.15.

One of the main failures of the organization is considered to be the lack of visibility and dissemination of the sustainability strategy that the university has (the code has 7 quotations associated to it and a density of 1). This is considered the responsibility of the institution and thus responsibility for generating compliance with it and promoting sustainable individual practices is attributed to the university. The organization is also considered responsible for not adopting decisions that would increase sustainability and do not have high costs (“Top-down decision-making for high sustainability” – 7-1).

A lack of coordination between different university departments and personnel categories is also considered to be a main failure attributable to the organization and thus to the level of top management. There are several codes that refer to this, such as “Need to approve an integrated sustainability plan” (5-1); “Plans for better streamlining” (1-1); “Lack of coordination among personnel

categories” (3-1); “Organize social participation platforms” (2-1). All of them refer to the need of organizing internal processes in a coordinated way to ensure sustainability.

Besides the organization itself, structural factors such as cooperation with external actors are also considered responsible for some of the unsustainable practices in the workplace. People mention, for example, the difficulties in cooperating with external institutions such as local government in areas of transport or campus infrastructure or with companies to which services have been externalized: “Necessity for a better public transport system” (7-2); “Difficulty of cooperation in waste management with external actors” (3-1) or “Externalized service makes control difficult” (2-1).

In spite of these difficulties, the university is considered responsible for controlling the input of materials. The code “Control input of materials” has 2 quotations associated to it and a density of 10, suggesting this as an area where significant improvement can be achieved in the organization in terms of sustainability. This is the case because this code is associated with most of the other codes that refer to the responsibility of the university and especially to its level of top management where the most important sustainability-related decisions are made. This is an important node of connection among codes.

Other structural factors that are considered to exert influence on organizational sustainability refer to the system of laws and norms regarding sustainability. Thus, it is considered that “societal legislation should constrain unsustainable behavior” (1-1) and that “external norms restrict decision-making” (2-1) at the organizational level.

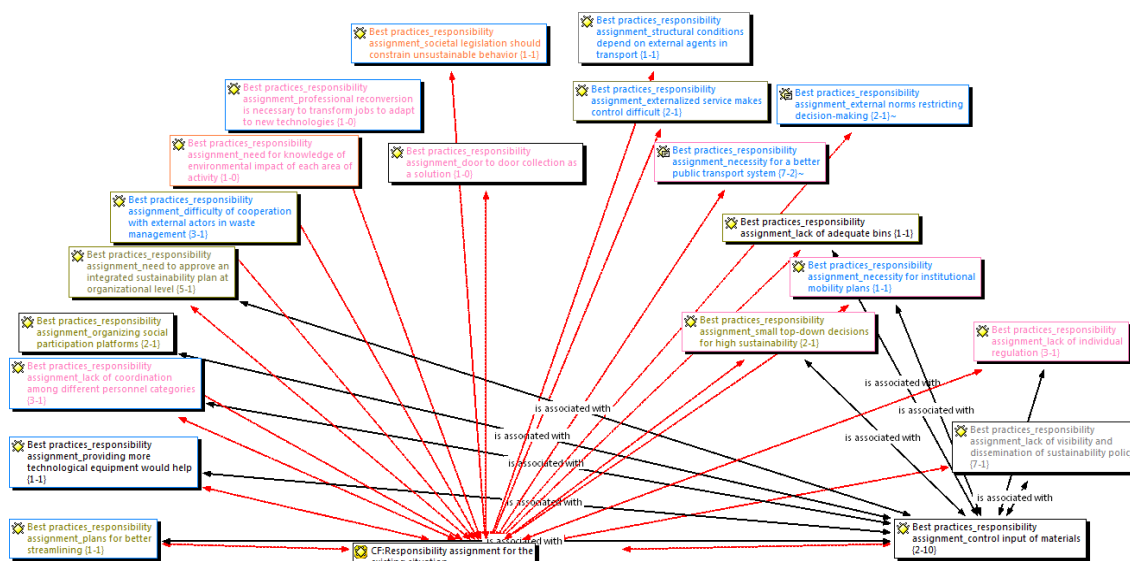


Figure 2.15. Conceptual network of responsibility attribution for existing practices

Barriers in achieving a more sustainable organization

There are many references to barriers in the discussion of the focus groups. These barriers are again related to the organization, on the one hand, and to structural factors external to the university, on the other. A general conceptual network concerning the dimension of barriers is provided in figure 2.16.

Among the barriers related to the organization itself, we can identify two categories: one related to *Structural/physical or material conditions*, and the other related to *Individual and collective human elements*. Belonging to the first category, university members mention Building characteristics (3-1) acting as constraints to sustainable practices, Old installations (2-1), Lack of student residences (2-1), and Constructing the university buildings in different places in the city (1-1). The first two codes pertain to the area of energy consumption and the last two, to the area of organization-related mobility.

When talking about infrastructure or material elements in general, subjects mention cost as a major barrier in creating conditions for a low carbon organization. Thus, cost is mentioned both in relationship to new installations (“Initial cost of new installations” – 2-1), and to adaptation of buildings (“Cost of adaptation of buildings acts as constraint” – 2-1).

When talking about structural factors external to the university acting as barriers, most references are to those affecting organization-related mobility. Thus, it is considered that “Urban design limits bicycle use”(1-1), “Local climate restricts bicycle use” (2-1), and the “Geographic dispersion of the population” (1-1) is considered a limitation. These codes refer to a few characteristics of the city and the area in which the campus of Corunna is situated. It is situated just at the outskirts of the city and the main access to it is from a major highway. Local climate includes a dominance of rain and windy days which makes bicycle use more difficult. And Galicia, the province where Corunna and the campus is situated, is characterized by high dispersion of population, with small communities being the norm, which makes the organization of effective public transport more difficult.

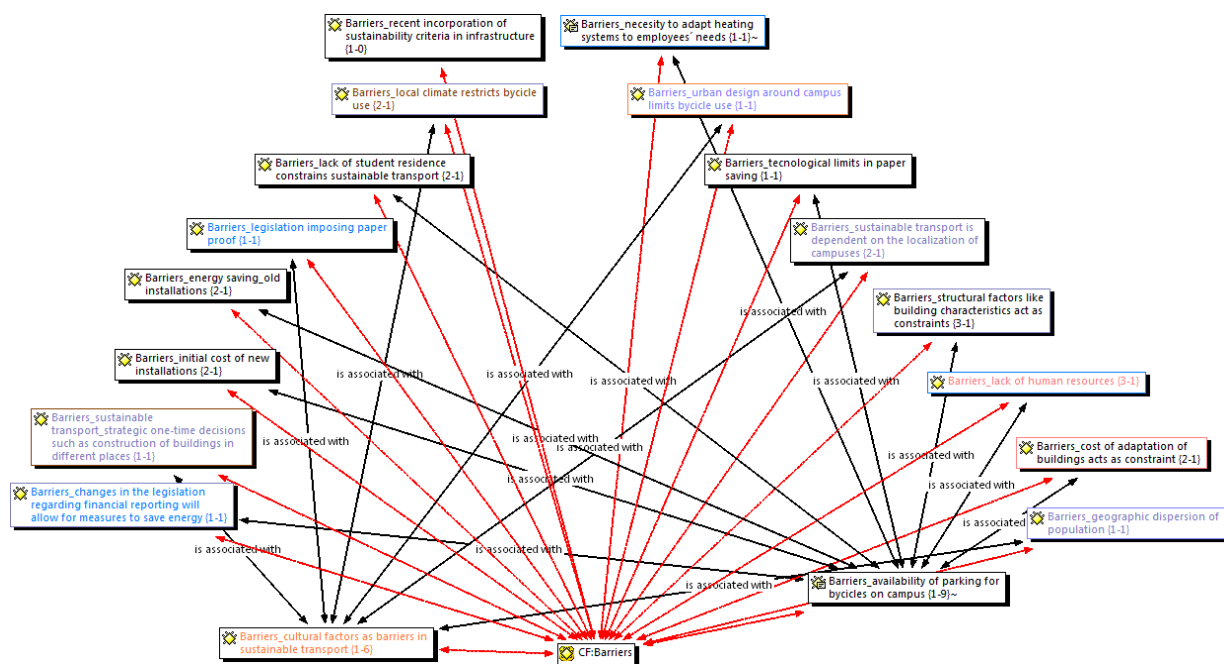


Figure 2.16. Conceptual network of barriers in achieving sustainability

2.4.3 Conclusion

After the analysis of documents and the interviews with key informers, we completed our diagnosis with two focus groups. Participants included management members occupying key positions in the organization on the one hand, and members representing all the relevant university groups,

developing their activities within the university structures, on the other. The information gathered in the focus groups (which followed the Guidelines formulated in Deliverable 2.1 for WP2) allowed us to go deeper into the analysis of existing practices as well as of barriers to, drivers for, and attitudes toward existing practices in the organization.

In combination with other research methods, focus groups are very useful in gathering detailed information on the perception of workers of several key aspects of environmentally-relevant practices within the university. This phase of our research is particularly useful both in diagnosing practices and in designing the questionnaire in WP4 in which we will gather information on aspects that we identified as relevant in the focus group analysis, such as: self-efficacy, collective efficacy, environmental attitudes, perceived environmental problems in daily university life etc.

Data obtained in the focus groups was then analyzed using the qualitative analysis software ATLAS.ti, which allows us to analyze the content of discussions using categories, establish conceptual relationships between those categories and then represent them in the form of conceptual networks of codes that map out the relevant points of discussion in the focus group. Five code families were established: a) attitudes; b) values held by university members; c) good practices, including both observed and lacking sustainable practices at the university; d) the attribution of responsibility for existing practices; and e) the existing barriers or obstacles in reaching a more sustainable organization. Codes and code families were derived inductively from the contents of the focus groups, using situational analysis as an organizing framework.

2.5 General conclusions

The image resulting from this study is a complex one in the University of Corunna. There are a few things that are worth noting as general trends that we can disentangle from the mosaic of findings already presented in this report. First, we can easily note that workers in general are aware about the importance of developing sustainable behaviors, as it is shown by the fact that they report changes in their behavior at home in the last three years in the area of energy consumption, waste generation and management and mobility.

The reported changes coincide with the areas on which governments and mass-media have focused in their campaign, which indicates that some of these have been effective but also indicate the fact that individually-driven change is difficult to find. This is an important conclusion to be taken into account when studying spill-over behaviors between home and work and the possibility of implementing strategies that have worked in the household environment into the organizational context of the university.

Secondly, we can see that there is a big gap between university policy and intended strategies to promote sustainable practices in the workplace both through structural changes such as adaptations of infrastructure and technology and through human changes such as campaigns to change behaviors at work, and the perception workers have about this policy.

From the analyses we have undertaken in WP2, we can conclude that this is due to various factors. First, the university strategies as evidenced by the analyzed documents tend to be top-down strategies that do not include established structures of participation of relevant university groups and are mostly centered on changing infrastructure and creating the contextual conditions for more sustainable consumption, waste management and mobility practices. Thus, they do not rely on strategies targeted at changing workers behavior or on campaigns of raising environmental awareness. The only strategy that might lead to an increase in environmental awareness is the dissemination of environmentally friendly measures taken in infrastructure adaptation. The risk of having this as the only behavior-changing strategy is that the University might spend significant amount of money in adapting the infrastructure but if behavior does not adapt, then it will not achieve all the reductions in CO₂ emissions that it could.

Secondly, both in the focus groups and in the interviews with key-informers, we find that the general perception is that the University either does not attribute importance to sustainable practices and does not establish them as a priority, or the perception is that it does not do enough to transform it into a sustainable organization. This shows a very deficient communication strategy in the University, because, as it was revealed in the focus group discussions, there are numerous measures that the university has taken that are virtually unknown to the workers and the University community in general.

Thirdly, university members attribute most responsibility for transforming practices at work into more sustainable ones almost entirely to the university. This justifies a state of passivity and it might reinforce the management's perception that there is no use for adopting behavior changing measures beyond infrastructure adaptation. Even when university members list personal values, attitudes, or awareness among the factors that determine sustainable behavior at work, they still consider the development of these attitudes or awareness to be the responsibility of the institution, who should design campaigns to raise that awareness.

These findings suggest that the University management should make it a priority to establish better participatory consultation structures that would ensure that members of the university community would participate into every step of the process of decision-making on sustainability issues, in order to not only make their voice heard but, most importantly, to become motivated to act sustainably in the work place, as people are more likely to become motivated in projects and strategies they helped define.

3. ROMANIA

National report
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3.1. Introduction

3.1.1 General environmental issues and current carbon emission policies of Romania

To date, Romania has adopted several policies and legislative measures on climate change. These include the reduction of greenhouse gas emissions and the adaptation to the effects of climate change, in agreement with the United Nations Framework Convention on Climate Change, the Kyoto Protocol Convention, plus the European Union policy. Within the National Reform Program, implemented by the Romanian Government in April 2011, it will be drawn into the National Strategy on Climate Change 2011 – 2020, which will be correlated with the actions from the legislative package “Energy – Climate Change”, and also “The roadmap for the transition until 2050 on a low carbon economy”.

With regards to the emissions reduction component, Romania has assumed, under the Kyoto Protocol to achieve a greenhouse gas emissions reduction (GHG) of 8% at the country level until 2012, compared to the base year 1989 (this correspond to a reduction of 280 million tones CO₂ equivalent).

At the same time, as an EU member, Romania supports the implementation of the legislative package “Energy – Climate Change”, which establishes the legal framework for the EU to fulfill its independent commitment to reduce GHG emissions by 20% (compared to 1990 level) by the year 2020. However, between the years 1989 – 2009, the total GHG emissions decreased by 54.17% and the net emissions by 62.81%.

To achieve the goal of reducing CO₂ emissions in a cost-effective way, Romania participates to the European Union Scheme of greenhouse gas emissions certificates commercialisation (EU ETS). Together with the EU ETS scheme, The Romanian Ministry of Environment and Forests (MMP) coordinates the elaboration of policies and strategies of GHG emissions reduction in non ETS sectors (sectors which are not covered by the emissions commercialisation scheme – i.e.: transport, agriculture, waste, residential sector), in agreement with the decision regarding the effort of the Member States to reduce the GHG emissions in order to fulfill the commitments until 2020.

3.1.2 Case-study: S. C. Aquatim s. a. Timișoara, Romania

Aquatim S.A. is the regional operating company of public water and waste-water services for Timis County (in the west of Romania). The company serves about 350,000 consumers and it covers 40 localities in the operating area. The company has 5 district offices, with a total of 911 employees.

The two major responsibilities of the company are consumers’ health, safety and comfort and the protection of water resources.

The company’s commitment for operating performance and quality services is certified by a first class operating license, granted by the National Authority for Regulating Public Utilities Communal Services, in 2003 and by the implementation, in 2005, of the integrated quality, environmental, occupational health and safety management system (ISO 9001, ISO 14001 & OHSAS 18001).

Aquatim ensures water quality and is concerned with the protection of the aquifer resources. In Timisoara the water is supplied from both ground and surface sources, via three treatment plants, operating with state of the art technologies: the locations are Bega, Urseni and Ronat. Approximately two thirds of the supplied water comes from the Bega treatment plant. The rest is supplied by ground sources, treated in the Urseni and Ronat plants. Over 80% of the treatment processes are automatically monitored and controlled, as a result of the investment programs for upgrading equipment, completed during the previous years and supported from its’ own funds. This led to a significant reduction in energy consumption.

An ongoing monitoring program of the waste-water discharges in Timisoara has been carried out by Aquatim since 2005. The water quality specialists perform laboratory tests on waste-water samples from the discharges of the monitored companies on a monthly basis. Water loss reduction is a major concern amongst worldwide operators. Aquatim implements its water loss reduction strategies with

advanced control and sectorization. In 2009, the company implemented an online monitoring system of the supply network, in which the sensors installed on the pipes can measure the pressure and flow rate, sending data directly to the dispatcher via computer.

The waste-water treatment plant (WWTP), commissioned in 1912 but developed later, is currently going through a complete upgrading program, financed by the EU.

Another important project, completed in 2009, was the development of the existing monitoring system of the water supply network. Since 2002, Aquatim has benefited from significant European financial resources to develop its environmental infrastructure, utilising the ISPA measure no. 2000/RO/16/P/PE/004 on “Rehabilitation of the treatment technology of waste-water and improving the sewerage network for the population of Timisoara city, situated in the Timis County in Romania”. The Aquatim R&D department are focused on identifying solutions for water quality improvement, environmental protection and developing cost-efficient technologies to be applied within these processes. The company has participated as a partner in research programs of excellence (PN II, FP7, CEEX), together with national research institutes and academic institutions. Aquatim belongs also to several regional technological e-networks of excellence (“e-clean water”, “e-aparefolosire”).

Aquatim is also concerned for consumer’s education for a cleaner environment, through the awareness of the threat posed by pollution and water waste. Thus, in recent years, the company has organized many local environmental actions, some of them being already well established: World Water Day (March, 16-22), World Environmental Day (June, 5), Bega Boulevard (June, 19) and Timisoara Quality Week (November, 11).

3.2 Interviews with key informers

Following the general WP2 protocol for data collection, data for the Romanian case-study were collected through interviews with key informers, through two focus groups, and through an analysis of relevant organizational documents.

To identify the everyday practices relating to resource consumption (materials, energy), waste generation and management, and organisation-related mobility, as well as the work-home relations in these domains, 119 interviews were conducted, using the same structured interview track already described in the Spanish report. The interviews were conducted with employees from 4 different locations of the organization: *The Headquarter*, which is an office building with four floors, situated in the city centre; *The Laboratory*, which is a building located in a neighbourhood with houses and gardens on the outskirts of the city, with the specific destination to host modern laboratories, where water analysis are performed; *The Water Plant 2-4*, which is a large site, situated on the river Bega, where there are outdoors workstations, the old water plant building and other buildings hosting offices, workshops and spaces with specific technical equipment; *The Unity* situated on *Cerna Street*, which is the location of the organisation's fleet (with over 100 intervention vehicles), of the storage areas, and of some office buildings.

3.2.1 Methods

In order to analyse the contents of the interviews, quantitative and the qualitative data were processed using the SPSS software. For the structured questions with quantitative scales, a descriptive analysis of frequencies has been performed. For the open-ended questions, with qualitative answers, an analysis of emerging thematic areas was conducted, and the resulting data were digitalized in a MS Office Word document and introduced as the main "Hermeneutic Unit" to be analysed through the ATLAS.ti software.

The answers from each question were coded according to the principle "theme – area – answer". To categorize the "themes" the following labels have been used: Barriers, Drivers, Good practice, Bad practice. For what it concerns the "area", we have identified the following: energy and resource consumption, actions related to waste, adopting responsible travel behaviour, energy saving at home, less use of the car for personal travelling, paper saving at home, recycling or separating waste at home, reducing air travel within personal travel, storing products for reuse at home, walk more than car use, water saving at home. The codes have been named so as to facilitate the understanding of each question from the questionnaire, to which each code makes reference.

A colour was assigned to each code, according to the Situational Analysis method (Clarke, 2005). Thus, light grey was used for the codes which are found in the category of Organizational and Institutional Elements, orange for Sociocultural Elements, mauve for Spatial and Temporal Elements, yellow for Other Empirical Elements, green for Discursive Constructions of Actors, light blue for Political Economic and Institutional Elements, pink for Individual and Collective Human Elements, black for Material/Physical and Structural Elements, dark grey for Major Contested Issues/Popular and other discourses and dark blue for Local to Global Elements.

3.2.2 Results

Socio-demographic and structural variables

The results concerning the main trends in the demographic and structural variables are illustrated by the graphs reported in figures 3.1, 3.2, 3.3, 3.4, and 3.5.

Figure 3.1. Frequency charts for interview location

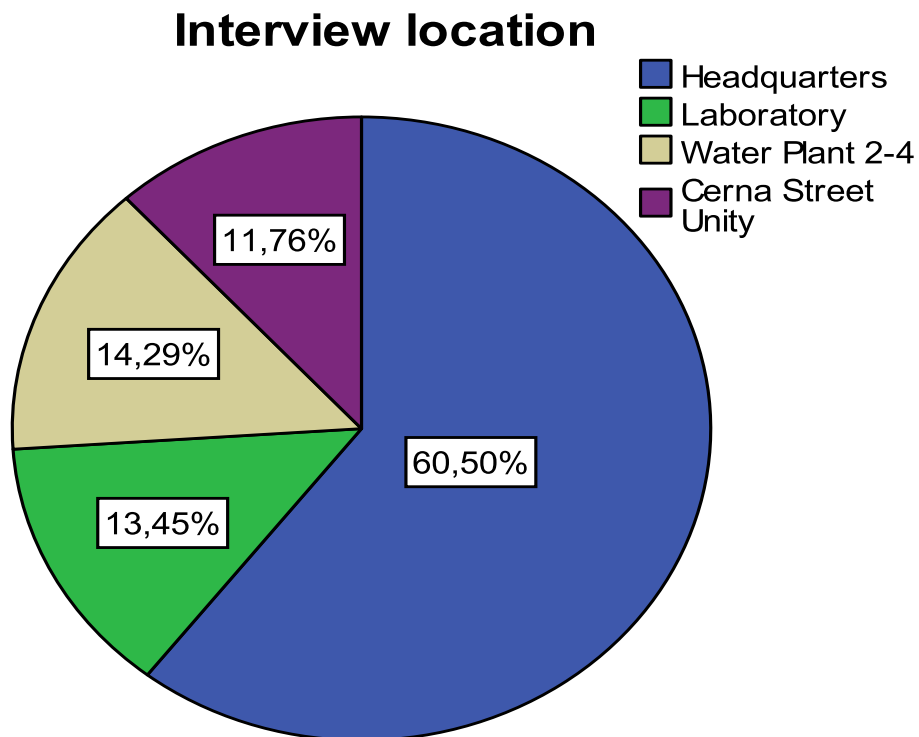


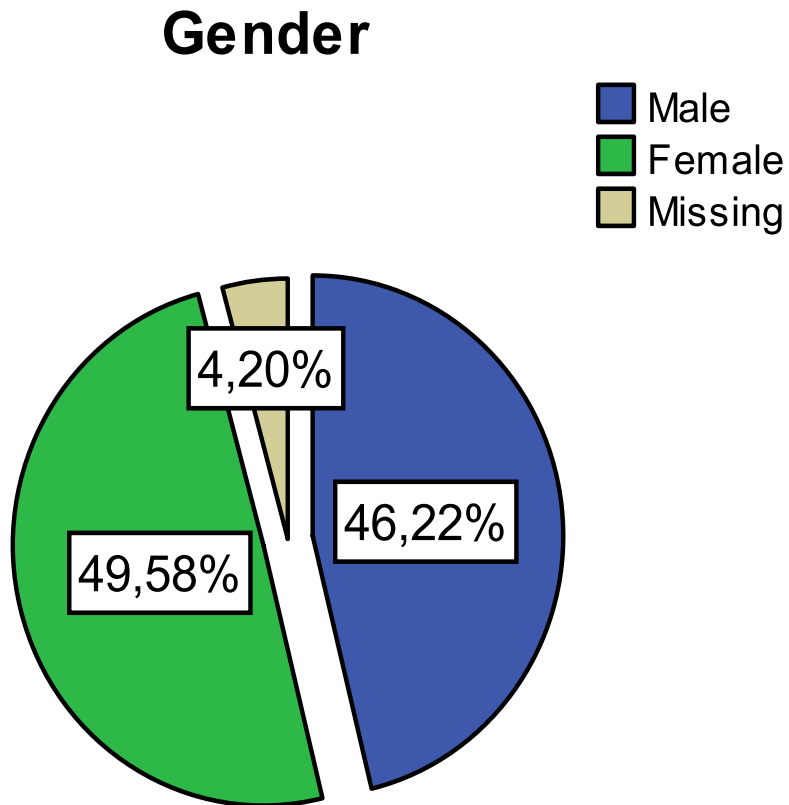
Figure 3.2. Frequency charts for gender

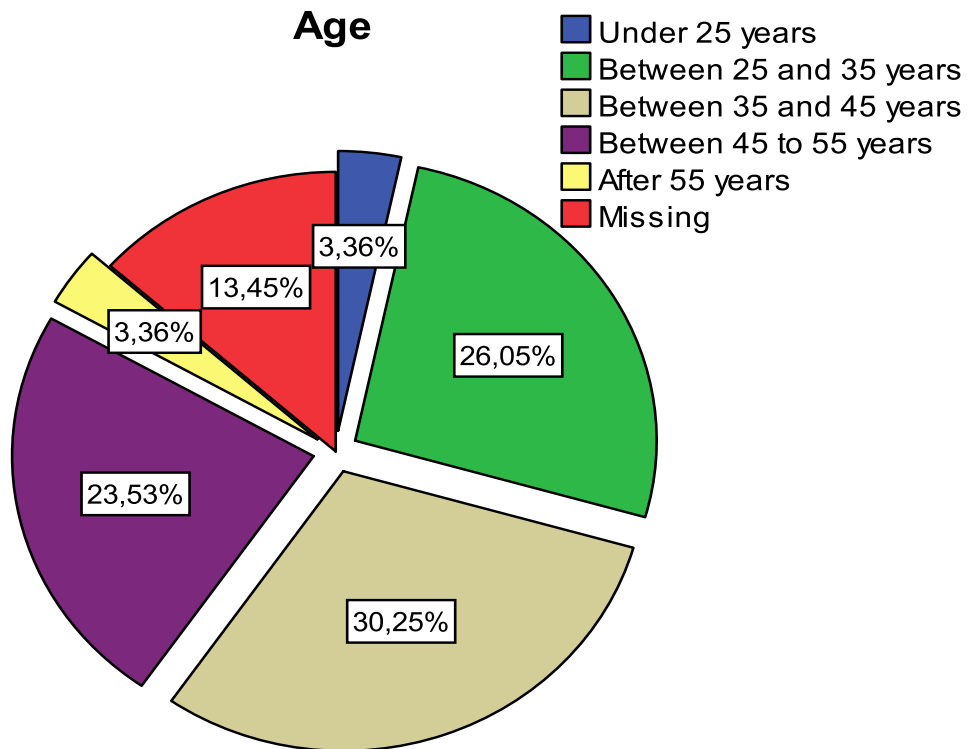
Figure 3.3. Frequency charts for age

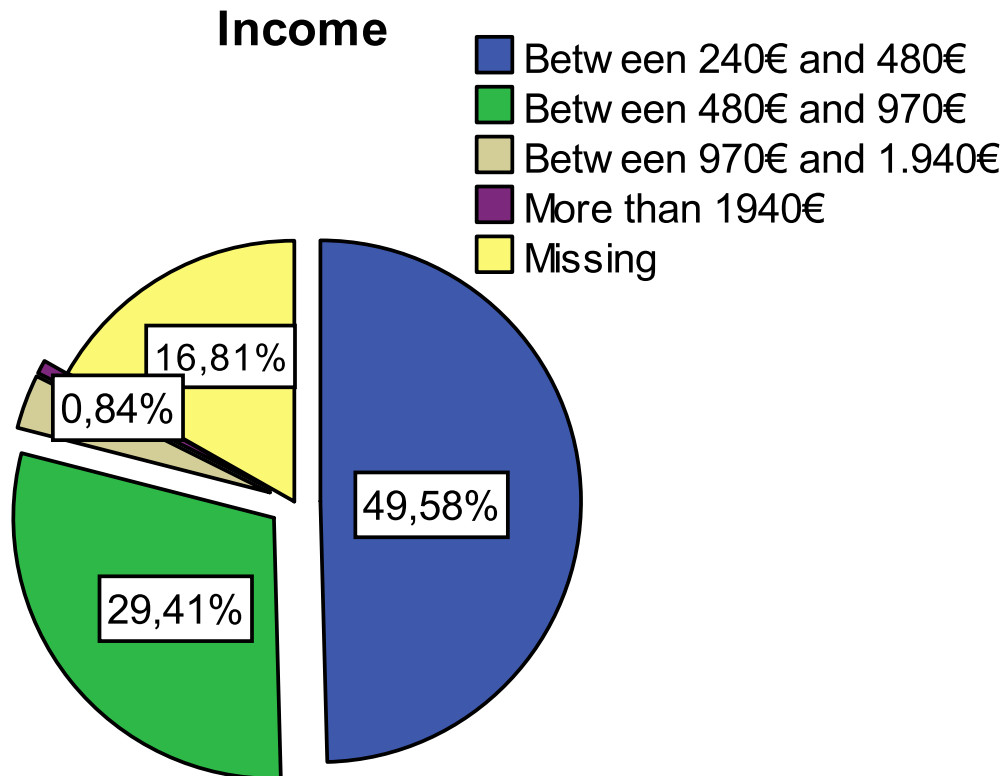
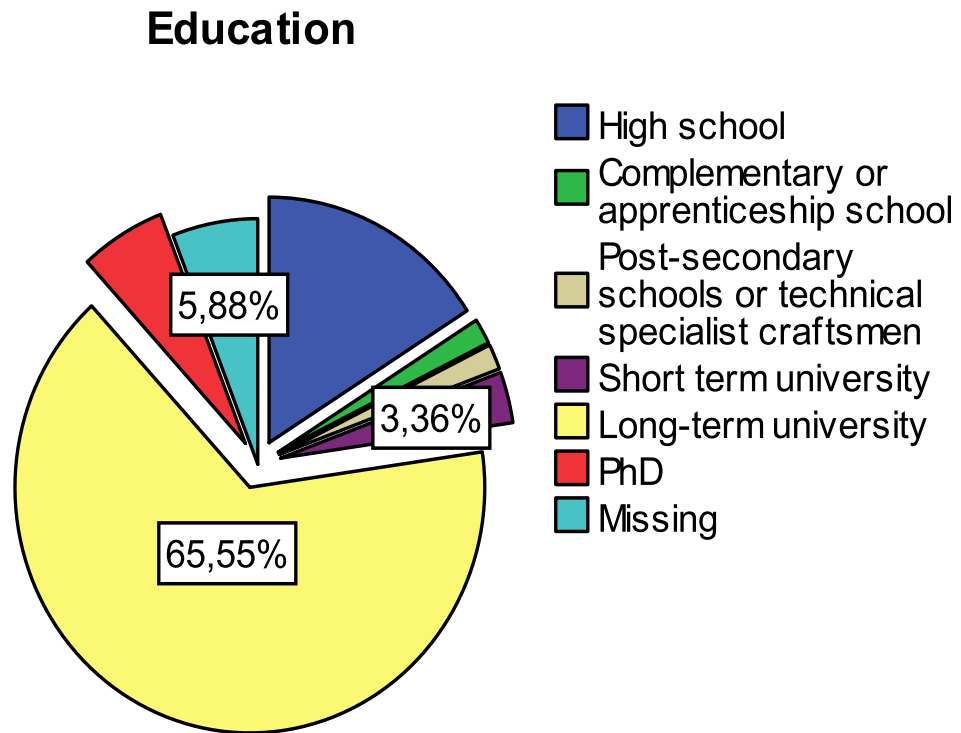
Figure 3.4. Frequency charts for income

Figure 3.5. Frequency charts for education

Consumption-related practices in the organization

Our results show that there are several practices related to consumption that approximately 50% of respondents indicated that they **always** observed in their organization. These practices are, in descending order of frequency: *control of turning equipment off at the end of the day, use of public water providers, use of email more than of regular mail, use of natural light as long as possible and control of light switching at the end of the day.*

Approximately, the 50% of respondents think that the organization concedes **a lot** of importance to several practices related to consumption of material and energy. These practices are, in descending order of frequency: *use of public water providers, use of email more than of regular mail, efficient systems of water use, control of turning equipment off at the end of the day, use of natural light as long as possible and use of recycled paper.*

Furthermore, about 50% of respondents believe that employees assign **a lot** of importance to the following types of practices: *use of public water providers, use of email more than of regular mail, use of natural light as long as possible, control of turning equipment off at the end of the day and efficient systems of water use.*

These results seem to suggest a high similarity between respondents' perceptions regarding the importance conceded by the organization and the importance assigned by employees to resource consumption practices. In fact, the frequencies are very similar for the mentioned practices, except for the case of '*use of recycled paper*', which is perceived as a practice to which the organization assigns more importance than the employees. The practices observed most often are also the most valued.

Waste-related practices in the organization

There are several practices related to the *generation and management of waste* indicated by a large percentage of respondents as being **always observed** in this organization. These practices are, in descending order of frequency: *waste separation for used toners, waste separation for paper, recycling of printed paper and use of plastic in organizational materials.*

Regarding the perception of the key-informers about the **importance conceded by the organization** to practices related to the *generation and management of waste*, the respondents indicated that the organization concedes **a lot** of importance to the same practices mentioned as always observed and, in addition, *waste separation for batteries* is a practice perceived as very important for the organization. More than 50% of respondents believe that **employees** assign **a lot** of importance to several of the same practices, as above - *waste separation for paper, waste separation for used toners, recycling of printed paper* – and **quite a lot** of importance to *use of glass in restaurant and cafeterias or vending machines.*

These results also support the assumption that the waste-related practices which are observed most frequently within the organisation are the ones that are given more importance, both by the organisation in general and by the single employees in particular. It may be noted, however, a small gap between the degree of importance that the organisation gives to the waste related practices and the importance assigned by the organisation's employees, with the latter being lower than the former.

Travel-related practices in the organization

The employees' answers regarding the travel-related practices are much more heterogeneous compared to those regarding the consumption-related and waste-related practices.

On the one hand, there are items for which the distribution of participants' responses is relatively uniform; on the other hand, there are some items for which the frequencies registered for a certain category of answer may have different meanings.

The respondents reported that *the use of public transport to go to work* can often be observed at among the employees, and *sometimes walking or cycling* and *car-sharing to go to work*.

Among the practices observed, many of the respondents indicated that *it does not exist* in their organization any *shuttle service provided by the organization* and *work-related airplane travels*. The majority of the respondents says that an *organizational car fleet with methane or electric engine does not*, and a quite a large percentage reported that *they don't know*.

Many respondents considered that the organization gives *quite a lot* importance to *use of public transport to go to work* and to *the use of video and e-conferences with colleagues from distant places*. Although a certain percentage of the respondents considers that the organization does not give any importance at all to creating an own *organizational car fleet with methane or electric engine*, to the *shuttle service provided by the organization*, to *car-sharing to go to work*, another significant percentage answered that they *do not know* how much importance the organization attributes to these practices.

The importance assigned by the employees, from the respondents' point of view, is relevant regarding some practices. The organisation's employees attribute *quite a lot* importance to *the use of public transport to go to work* and to *use of video and e-conferences with colleagues from distant places*.

Many respondents think that *car-sharing to go to work* has little importance given by the employees and quite many of them reckon that they *do not know* how much the employees of the organisation value this practice.

A significant part of the respondents considers that an *organizational car fleet with methane or electric engine* has *no importance* for the employees of the organization.

It's very important to say that, although the answer to the question "*How many people share the care with you?*" shows at a rate of 41.7% that 2 persons share the car and 27.8% for one person, we must take in consideration that for the 69.7% of the respondents this question was not answered to.

Therefore, these results should be taken with great caution.

There are some issues that emerge from an overall analysis of answers regarding travel-related practices, compared to the previous two domains (consumption and waste): the answers' great heterogeneity, the answers' lack of convergence in the three specified areas (observed practices, importance shown by the organization and importance shown by the organization's employees), the high frequency of *do not know* answers regarding the importance attributed to some observed practices.

Consumption-related practices at home

Regarding the consumption-related practices that the interviewed declare to follow in their private life (i.e. at home), the results show that the majority of respondents report that over the past three years they have taken steps to reduce energy, water or paper consumption. As table 3.1 shows, the highest percentage was registered for what it concerns energy saving.

Table 3.1: Measures taken at home by key-respondents to reduce consumption of energy, water or paper.

Energy saving		Water saving		Paper saving	
Yes	No	Yes	No	Yes	No
84,2%	15,8%	78,6%	21,4%	68,8%	31,2%

Some differences in the answers on saving practices at home were detected as a function of the main demographic and structural variables. These distributions are reported in detail Table 3.2.

Table 3.2: Measures taken at home by key-respondents to reduce consumption of energy, water or paper, as a function of gender, age, income and education

		Energy saving		Water saving		Paper saving	
		Yes	No	Yes	No	Yes	No
Gender	Male	90,6%	9,4%	77,4%	22,6%	73,1%	26,9%
	Female	79,3%	20,7%	78,6%	21,4%	64,8%	35,2%
Age	Under 25 years	75,0%	25,0%	50,0%	50,0%	75,0%	25,0%
	Between 25 and 35 years	79,3%	20,7%	69,0%	31,0%	67,9%	32,1%
	Between 35 and 45 years	86,1%	13,9%	82,4%	17,6%	71,4%	28,6%
	Between 45 to 55 years	96,4%	3,6%	92,9%	7,1%	80,0%	20,0%
	After 55 years	100,0%	0%	100,0%	0%	50,0%	50,0%
Income	Less than 240€	83,3%	16,7%	78,7%	21,3%	69,2%	30,8%
	Between 240€ and 480€	0%	0%	0%	0%	0%	0%
	Between 480€ and 970€	0%	0%	0%	0%	0%	0%
	Between 970€ and 1940€	0%	0%	0%	0%	0%	0%
	More than 1940€	0%	0%	0%	0%	0%	0%
Education	Not graduated from any school	0%	0%	0%	0%	0%	0%
	Primary school	0%	0%	0%	0%	0%	0%
	Secondary school	0%	0%	0%	0%	0%	0%
	High school	89,5%	10,5%	78,9%	21,1%	68,8%	31,3%
	Complementary or apprenticeship school	100,0%	0%	0%	100,0%	100,0%	0%
	Post-secondary schools or technical specialist craftsmen	100,0%	0%	100,0%	0%	100,0%	0%
	Short term university	75,0%	25,0%	75,0%	25,0%	66,7%	33,3%
	Long-term university	84,2%	15,8%	81,3%	18,7%	66,7%	33,3%
	PhD	83,3%	16,7%	80,0%	20,0%	100,0%	0%

As stated, the results shown in table 3.1 and 3.2 indicate the existence of some differences in the measures taken at home to reduce consumption of energy, water or paper as a function of the specific characteristics of respondents, as **gender**, **age**, **income** and **education**. However the two-sided [asymptotic significance](#) of the chi-square statistic is greater than 0.10 for all the cases; therefore, we can conclude that the differences observed in responses are not due to characteristics of respondents, but there are due to chance variation.

It is also important to note a large area representing the absence of responses to the questions regarding saving practices at home, for some categories of respondents.

Waste-related practices at home

As shown in table 3.3, the percentage of respondents who have taken measures for the use and management of waste in an environmentally responsible manner at home, over the past three years, was large enough for the *recycling and separate waste collection* component. Only about half of respondents said they have taken measures regarding *storage of products for reuse* and *reduced use of plastic products*.

Table 3.3: Measures taken at home by key-respondents related to responsible use and management of waste

Recycling or separating waste		Storing products for reuse		Reducing the use of plastics	
Yes	No	Yes	No	Yes	No
73,0%	27,0%	49,1%	50,9%	56,3%	43,8%

As reported in table 3.4, some differences between the responses were detected, depending on gender, age, income and education of respondents. However, only the differences between responses about *storing products for reuse* depending on *income* of respondents seem not due to chance (.020).

Table 3.4: Measures taken at home by key-respondents for the use and management of waste in an environmentally responsible manner, differentiated by gender, age, income and education

		Recycling or separating waste		Storing products for reuse		Reducing the use of plastics	
		Yes	No	Yes	No	Yes	No
Gender	Male	78,4%	21,6%	46,2%	53,8%	51,9%	48,1%
	Female	68,4%	31,6%	51,0%	49,0%	59,6%	40,4%
Age	Under 25 years	100,0%	,0%	75,0%	25,0%	50,0%	50,0%
	Between 25 and 35 years	60,7%	39,3%	51,7%	48,3%	60,0%	40,0%
	Between 35 and 45 years	77,8%	22,2%	47,1%	52,9%	55,6%	44,4%
	Between 45 to 55 years	77,8%	22,2%	45,8%	54,2%	56,0%	44,0%
	After 55 years	75,0%	25,0%	50,0%	50,0%	50,0%	50,0%
Income	Less than 240€	,0%	,0%	,0%	,0%	,0%	,0%
	Between 240€ and 480€	78,6%	21,4%	59,6%	40,4%	60,0%	40,0%
	Between 480€ and 970€	61,8%	38,2%	28,1%	71,9%	41,2%	58,8%
	Between 970€ and 1.940€	75,0%	25,0%	25,0%	75,0%	75,0%	25,0%
	More than 1940€	,0%	100,0%	100,0%	,0%	,0%	100,0%
Education	Not graduated from any school	,0%	,0%	,0%	,0%	,0%	,0%
	Primary school	,0%	,0%	,0%	,0%	,0%	,0%
	Secondary school	,0%	,0%	,0%	,0%	,0%	,0%
	High school	88,2%	11,8%	53,3%	46,7%	68,8%	31,3%
	Complementary or apprenticeship school	100,0%	,0%	,0%	100,0%	,0%	100,0%
	Post-secondary schools or technical specialist craftsmen	50,0%	50,0%	,0%	100,0%	,0%	100,0%
	Short term university	100,0%	,0%	66,7%	33,3%	75,0%	25,0%
	Long-term university	69,3%	30,7%	47,9%	52,1%	55,3%	44,7%
	PhD	71,4%	28,6%	66,7%	33,3%	71,4%	28,6%

Travel-related practices at home

For what it concerns the travel related practices at home, the main results are summarised in Table 3.5. As can be noted, only about half of the responses reported reduced use of personal moriized vehicles in their private life.

Table 3.5: Measures taken by key-respondents for reducing the use of the vehicle for personal travels.

Less use of the car		Walk more than car use		Reducing air travel by using alternative means of transportation	
Yes	No	Yes	No	Yes	No
43,5%	56,5%	50,5%	49,5%	40,0%	60,0%

As reported in Table 3.6, we can observe some differences between the responses, depending on gender, age, income and education of respondents. However, only gender differences seem not due to chance, in particular in case of **walk more than car use**(.005).

Table 3.6: Measures taken by key-respondents for reducing the use of the vehicle for personal travels, differentiated by gender, age, income and education

		Less use of the car		Walk more than car use		Reducing air travel by using alternative means of transportation	
		Yes	No	Yes	No	Yes	No
Gender	Male	51,1%	46,6%	33,3%	60,8%	50,0%	51,9%
	Female	48,9%	53,4%	66,7%	39,2%	50,0%	48,1%
Age	Under 25 years	2,4%	5,4%	2,1%	6,7%	2,9%	5,8%
	Between 25 and 35 years	34,1%	26,8%	25,0%	33,3%	31,4%	28,8%
	Between 35 and 45 years	34,1%	37,5%	45,8%	28,9%	37,1%	36,5%
	Between 45 to 55 years	24,4%	28,6%	22,9%	28,9%	25,7%	25,0%
	After 55 years	4,9%	1,8%	4,2%	2,2%	2,9%	3,8%
Income	Less than 240€	,0%	,0%	,0%	,0%	,0%	,0%
	Between 240€ and 480€	,0%	,0%	,0%	,0%	,0%	,0%
	Between 480€ and 970€	,0%	,0%	,0%	,0%	,0%	,0%
	Between 970€ and 1.940€	18,6%	15,0%	21,6%	8,2%	26,5%	8,9%
	More than 1940€	,0%	3,3%	,0%	4,1%	5,9%	,0%
Education	Not graduated from any school	4,7%	,0%	,0%	4,1%	,0%	3,6%
	Primary school	4,7%	1,7%	5,9%	2,0%	,0%	3,6%
	Secondary school	67,4%	71,7%	62,7%	77,6%	61,8%	76,8%
	High school	4,7%	8,3%	9,8%	4,1%	5,9%	7,1%
	Complementary or apprenticeship school	70,3%	51,8%	63,6%	52,2%	64,7%	54,2%
	Post-secondary schools or technical specialist craftsmen	29,7%	39,3%	29,5%	43,5%	35,3%	35,4%
	Short term university	,0%	7,1%	6,8%	2,2%	,0%	8,3%
	Long-term university	,0%	1,8%	,0%	2,2%	,0%	2,1%
	PhD	51,1%	46,6%	33,3%	60,8%	50,0%	51,9%

Perceptions and attitudes about the issues of climate change and sustainability, personal changes in environmentally-related practices, and participants membership

Table 3.7 reports participants' answers to questions regarding the *sensitivity to the issue of sustainability and climate change*, regarding *changes in environmental and consumption practices in the last three years* and regarding the *understanding of the terms sustainable development or sustainability*, as a function of gender, age, education and income.

The differences seem significant for the question *How sensitive do you consider yourself to the issue of sustainability and climate change?*, in particular in relation to the *education* level of respondents (the p-value of the Chi-square test was .003).

Table 3.8 reports participants' membership to pro-environmental organizations and trade unions as a function of gender, age, education and income.

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Table 3.7: Sensitivity to climate change, modification of personal practices, and understanding of sustainability as a function of socio-demographic characteristics

		How sensitive do you consider yourself to the issue of sustainability and climate change?				Have you changed your environmental and consumption practices in the last three years?		What do you understand when you hear the terms sustainable development or sustainability			
		I have never heard about it	I am not very concerned about it	I am somewhat concerned about it	I am very sensitive about it	Yes	No	Don't know /NA	Wrong/ vague description	Generic/ incomplete description	Precise definition
Gender	Male	3,8%	22,6%	54,7%	18,9%	75,5%	24,5%	37,8%	21,6%	35,1%	5,4%
	Female	1,7%	31,0%	55,2%	12,1%	82,4%	17,6%	39,1%	15,2%	21,7%	23,9%
Age	Under 25 years	,0%	,0%	66,7%	33,3%	75,0%	25,0%	,0%	50,0%	,0%	50,0%
	Between 25 and 35 years	3,2%	32,3%	58,1%	6,5%	70,0%	30,0%	45,8%	4,2%	33,3%	16,7%
	Between 35 and 45 years	,0%	27,8%	61,1%	11,1%	81,3%	18,8%	32,1%	17,9%	25,0%	25,0%
	Between 45 to 55 years	7,4%	14,8%	63,0%	14,8%	87,5%	12,5%	42,9%	28,6%	28,6%	,0%
	After 55 years	,0%	33,3%	33,3%	33,3%	100,0%	,0%	,0%	50,0%	50,0%	,0%
Education	High school	,0%	33,3%	61,1%	5,6%	83,3%	16,7%	33,3%	33,3%	13,3%	20,0%
	Complementar school	,0%	,0%	100,0%	,0%	100,0%	,0%	,0%	50,0%	50,0%	,0%
	Post-secondary schools	100%	,0%	,0%	,0%	100,0%	,0%	100 %	,0%	,0%	,0%
	Short term university	,0%	25,0%	50,0%	25,0%	66,7%	33,3%	75,0%	25,0%	,0%	,0%
	Long-term university	3,9%	29,9%	51,9%	14,3%	74,3%	25,7%	40,0%	12,7%	34,5%	12,7%
	PhD	,0%	,0%	85,7%	14,3%	100,0%	,0%	33,3%	16,7%	16,7%	33,3%
Income	Less than 240€	,0%	,0%	,0%	,0%	,0%	,0%	,0%	,0%	,0%	,0%
	Between 240€ and 480€	1,8%	26,3%	56,1%	15,8%	80,4%	19,6%	34,1%	22,7%	27,3%	15,9%
	Between 480€ and 970€	5,9%	23,5%	64,7%	5,9%	68,8%	31,3%	52,0%	12,0%	24,0%	12,0%
	Between 970€ and 1.940€	,0%	25,0%	75,0%	,0%	75,0%	25,0%	25,0%	25,0%	25,0%	25,0%
	More than 1940€	,0%	,0%	100,0%	,0%	100,0%	,0%	100 %	,0%	,0%	,0%

Table 3.8: Membership to pro-environmental organizations and trade unions as a function of socio-demographic characteristics

		Do you belong to any environmental or ecological organization?		Do you belong to any union?		Are you currently or have you been a Union representative along the last 2 years?	
		Yes	No	Yes	No	Yes	No
Gender	Male	8,0%	92,0%	65,4%	34,6%	11,8%	88,2%
	Female	5,7%	94,3%	61,8%	38,2%	9,1%	90,9%
Age	Under 25 years	,0%	100,0%	25,0%	75,0%	,0%	100,0%
	Between 25 and 35 years	,0%	100,0%	48,3%	51,7%	6,9%	93,1%
	Between 35 and 45 years	9,4%	90,6%	72,2%	27,8%	8,8%	91,2%
	Between 45 to 55 years	13,0%	87,0%	64,0%	36,0%	16,7%	83,3%
	After 55 years	,0%	100,0%	100,0%	,0%	33,3%	66,7%
Education	High school	5,6%	94,4%	94,4%	5,6%	22,2%	77,8%
	Complementary school	,0%	100,0%	100,0%	,0%	,0%	100,0%
	Post-secondary schools	,0%	100,0%	100,0%	,0%	,0%	100,0%
	Short term university	,0%	100,0%	75,0%	25,0%	,0%	100,0%
	Long-term university	5,8%	94,2%	51,4%	48,6%	8,5%	91,5%
	PhD	33,3%	66,7%	71,4%	28,6%	,0%	100,0%
Income	Less than 240€	,0%	,0%	,0%	,0%	,0%	,0%
	Between 240€ and 480€	7,4%	92,6%	75,9%	24,1%	12,7%	87,3%
	Between 480€ and 970€	,0%	100,0%	58,8%	41,2%	8,8%	91,2%
	Between 970€ and 1.940€	25,0%	75,0%	25,0%	75,0%	,0%	100,0%
	More than 1940€	,0%	100,0%	,0%	100,0%	,0%	100,0%

Qualitative analysis of key informers' answers to open-ended questions

The methodological and conceptual framework of the Situational Analysis assumes that all “*the conditions of the situation are in the situation*” (Clarke, 2005, p. 71). It is important to recall here some of the main dimensions that, according to this theoretical proposal, can be used to understand and analyse any complex situation and phenomenon relevant to social interaction: *individual and collective human elements, material elements and spatial-physical features, political, economic and institutional elements, discursive constructions of actors and popular discourses, organizational and institutional elements, major contested issues and/through popular and other discourses, local to global elements, sociocultural elements, spatial and temporal elements, and others*.

It is also important to recall here that the Locaw project is focused in particular on low-carbon practices within organizations and at home, in three main different domains: use and consumption of materials and energy, waste generation and management, and organization-related mobility.

In the results reported in this section, we provide a qualitative content analysis of the answers to the open-ended questions expressed by our key-informers, in particular for what it concerns the perceived barriers and drivers to low-carbon practices. We also tried to assess whether the former are predominant over the latter, or vice-versa.

In the following paragraphs, we will present the main **barriers, drivers and good practices** that we have identified, in relation to each of the three main organizational behavioural domains considered. The results are summarized within three different boxes, separately for what it concerns barriers, drivers and good practices. Each box contains the following information: the total amount of codes, the full list of codes (except for the good practices list, where we will present only codes grounded by more than 2 quotations); the total amount of quotations coded with at least one code belonging to that Code family; in bold are reported the most frequent codes, with more than 4 quotations.

In particular:

- The Box 3.1 reports the main perceived barriers against sustainable organizational practices, identified through the open-ended questions of the interview track;
- The Box 3.2 reports the main perceived drivers supporting the adoption of sustainable organizational practices, identified through the open-ended questions of the interview track;
- The Box 3.3 reports the main good practices reported by participants, as emerged from the open-ended questions of the interview track.

Box 3.1: Perceived barriers against the sustainable organizational behaviours, identified through open-ended questions

Code Family: BARRIERS

Total amount of Codes: 41

Full list of codes: [Habit] [I don't know] [**Carelessness**] [**Convenience**] [Culture] [**Education**] [Financial] [High prices for water systems and electricity use] [I don't know] [Infrastructure] [Internal communication] [Lack of alternatives] [Lack of bicycle parking spaces] [Lack of centralized air conditioning system] [Lack of communication] [Lack of environmental culture] [Lack of environmental policies] [Lack of funds] [Lack of free subscriptions for city transportation] [Lack of information] [Lack of online signature] [Lack of sufficient natural light] [**Lack of time**] [Lack of windows] [Long distances] [Mentality] [**No barriers**] [Non-responsibility] [Non-selective collection of waste for metals] [Non-selective waste collection] [Poor conditions with the authorities] [Waste disposal where it is handier] [Waste lifting with low frequency]

Quotation(s): 91

Box 3.2: Perceived drivers supporting sustainable organizational practices, identified through open-ended questions

Code Family: DRIVERS

Total amount of Codes: 66

Full list of codes: [Accountability campaigns] [Achieving an optimal schedule for the inhabitants travel] [Activities for waste paper collection] [Available minibuses for team travel] [**Awareness of environmental responsibility**] [Awareness of health] [Awareness of the consequences of consumption of raw materials] [Bicycle parking spaces] [Buying cars with low emissions of gases] [Changing working hours] [Cheaper electric cars] [Control prints] [Creating a solid framework by administration] [Creating conditions for the exercise of the ecological instinct] [Debates about health and environment] [Discussing mitigation methods] [**Education**] [Encouragement] [Exemplification] [Explaining the greenhouse gases phenomenon] [Finances] [**Fines**] [Free subscriptions for public transportation] [I don't know] [**Information campaign and accountability**] [Inspection] [Location of waste containers] [Management involvement] [Media information about the collection of materials] [Media promotion] [More natural light] [Motivating with contests] [New selective waste containers] [Not the case here] [None] [Obligation] [Open information] [Penalties] [Posters for environment protection] [Presentation of positive aspects in case of recycling] [Presentation of the negative aspects in case of ignoring (emails, flyers)] [Presenting the advantages and disadvantages] [Reduce car trips] [Drivers_rewarding] [drivers_rules] [Drivers_**selective waste collection**] [Drivers_stimulation] [Drivers_there are a lot] [drivers_**there are none**] [Trainings] [Using bicycles] [Using e-mails] [Using economic bulbs] [Using public transportation] [Various actions to green coverage] [Warnings]

Quotation(s): 99

Box 3.3: Good practices reported in the open-ended questions

Code Family: GOOD PRACTICES

Total amount of codes: 120

Full list of codes:[**Control and reduce the consumption**] [Reuse of paper] [Using bicycle] [Using means of public transportation] [**Avoid printing**] [Avoid using the car in the city] [Battery ball] [[Control and reduce the consumption] [Deposit and reuse of products] [Don't own a car] [Don't really use (paper) at home] [Don't use airplane] [**Electrical household appliances class A**] [Eliminating losses of water] [**Energy saving light bulbs**] [Energy use only when needed][Glazed windows][Less space with heating] [**Low water consumption**] [**Maintenance of the valves**] [More walking] [Never travelled by airplane] [Not the case here] [**Partial selective collection**] [Replacement of batteries and water valves] [Reuse of glass products] [Reuse of office materials] [**Reuse of paper**] [**Reuse of plastic bags**] [**Reuse of plastic products**] [Reusing the glass jars] [**Selective collection**] [**Thermal insulation of walls**] [**Thermostatic valves for heating system**] [**Toilet tank**] [Toilet tank with two steps] [**Turning heat off in unused space**] [**Turning lights off in unused space**] [**Unplugging domestic appliances**] [**Use the washing machine at full capacity**] [**Using bicycle**] [Using biodegradable bags] [Using both sides] [Using car] [**Using cars only for long distances**] [**Using dishwasher**] [Using e-mail] [**Using glass products**] [**Using means of public transportation**] [**Using natural light**] [Using paper bags] [Using paper folders] [**Using showers**] [**Using textile bags**] [**Using train**] [**Walking**] [Water meter] [Water saving fixtures] [**Water saving when washing**] [**Writing until the page is full**]

Quotation(s): 445

3.3 Focus Groups

3.3.1 Methods

In the following paragraphs we present the results 2 focus groups, conducted with 18 representative employees of Aquatim (top and middle management staff).

To perform the qualitative analysis, the contents of the focus groups were transcribed as Microsoft Office Word documents, and used as Hermeneutic Units in the software ATLAS.ti.

The answers from each question were coded according to the principle “theme – area – answer”.

For what it concerns the “themes” the following labels have been used: Attitude, Bad practice, Good practice, Rules, Value.

For what it concerns the “areas” we have identified a set of short symbolic labels according to the discussions that were recorded within the focus groups. These area labels are: adopting responsible travel behaviour, energy saving at work, legislation, local institutions and organizations, resource management at work, water saving at work, recycling or separating waste at home, sustainability, gas emissions.

For what it concerns the “answers”, we started from participants statements, rewritten in a shorter form within the codes.

In a final analyses, families of codes have been created; each family symbolizes a discussion theme within the focus groups. A colour was assigned to each code, according to the theoretical dimensions of Situational Analysis (Clarke, 2005). We handled these information according to the same procedure previously described for the interviews with key informers.

The codes were double checked by a second researcher, before running the analysis.

3.3.2 Results

The results of the qualitative analyses of the focus groups are presented according to the main **themes** that emerged from the discussions. These themes were focused on the factors involved in organisation’s attitudes, values, rules, good practices and bad practices as they were described by the participants

The results are summarized within five different boxes, separately for what it concerns *attitudes, values, rules, good practices and bad practices*. Each box contains the following information: the total amount of codes, the full list of codes (except for the good practices list, where we will present only codes grounded by more than 2 quotations); the total amount of quotations coded with at least one code belonging to that Code family.

In particular:

- Box 3.4 reports the main attitudes towards the sustainable organizational behaviours, as expressed by participants to the focus groups, and identified through the qualitative analysis.
- Box 3.5 reports the main values endorsed at the organizational level, as expressed by participants to the focus groups, and identified through the qualitative analysis.
- Box 3.6 reports the main rules concerning sustainable practices within the organization, as expressed by participants to the focus groups and identified through the qualitative analysis.
- Box 3.7 reports the main good practices occurring within the organization, as expressed by participants to the focus groups and identified through the qualitative analysis.
- Box 3.8 reports the main bad practices occurring within the organization, as expressed by participants to the focus groups and identified through the qualitative analysis.

Box 3.4: Attitudes towards sustainable organizational behaviours, identified through the focus groups

Code Family: ATTITUDES

Total amount of codes: 52

Full list of codes: [We are concerned as society for the environment, from all points of view and in all places and localities] [At the organizational level there is no lighting practice economy] [Bicycle parking spaces are not guarded and there were many cases of stealing] [Concerned with waste management from previous years (selective disposal, recycling)] [Difficult collaboration with companies specialized in collecting glass and rubber] [Disapproval for the use of the word sustainability] [Discontent about storage of waste glass in a place away from home] [Disappointment because the waste is unselectively taken] [Economically, the expansion of Aquatim affected personal economic situation] [Education staff will not work in order to reduce energy because the system is automatized] [Expressing the desire to use the word Durable Development in favour of Sustainability] [Few know the meaning of the word sustainability] [Few parking lots at the headquarters] [Hoping that we will build a small photovoltaic plant] [In 2004 appeared for the first time the problem of Quality and Environmental Policy] [Is more efficient a new technology, rather than changing behaviour] [It is easier to understand the word Sustainable] [It should be a higher price on paper and plastic wastes] [Lack of parking spaces for cars] [Lack of safety on public roads when using bicycles] [Managers use company cars] [Might be cheaper to leave the light on than to buy new switches] [**Negative attitude about the collaboration with the local company for waste collection**] [No problems identified in the IT area] [People are motivated by money in their sustainable behaviour] [People at work have sustainable behaviour because they are obligated to do so] [Perseverance in selective waste collection although they are not selectively taken] [Problems have arisen with the local waste collection company in the sewer system] [**Sarcastic about the Hall of Timisoara**] [Solar energy is the only one that we can exploit as alternative energy in the region] [Technology reduces energy consumption] [The best way to encourage selective waste collection is by constraint] [The best way to encourage selective waste collection is by example] [The best way to encourage selective waste collection is not by constraint] [The effective selective collection of waste depends on the price of waste] [The Environmental policy is very good, easy to understand, takes into account of our company and the parties with whom we collaborate] [The only thing a person can make it to reduce energy into an automated system is turn off the light] [The organization doesn't care about the final destination of household waste] [The problem that is putting the bike is that you can not conveniently be very elegantly dressed] [The word Sustainable is not yet accepted in the Romanian language] [Thinking more about the household waste because 40% of the employees work in offices] [Using car by convenience] [Water economy practices vary depending on each person] [We are too poor to buy cheap stuff] [We didn't develop the subject inside the organisation] [We have implemented the international standard for the quality of environment ISO 14000] [**We have sustainable practices but we don't identify them as sustainable**] [We need more awareness inside the instructions about sustainable practices at all the levels of the organization] [We should improve the sealing system of channels] [What we had before the New Legislation was much better] [Wishing for more parking spaces for bicycles to be guarded] [Light bulbs with sensors should be placed in the corridors and toilets]

Quotation(s): 56

Box 3.5: Values endorsed at the organizational level, identified through the focus groups

Code Family: VALUES

Total amount of codes: 8

Full list of codes: [Better care for maintenance of installations after water metering] [Employees establish their personal policies related to saving energy and switch off lights in some offices, during the day] [In the laboratory analysis, employees are saving the gas on their own initiative] [People now have greater concern for the environment at the workplace] [Some people make economy to water, on their own initiative] [Sustainable behaviour at home] [Tried to encourage use of recycled paper in the offices, but have encountered difficulties in the their use for the printer, due to more porous structure of the paper] [We respected the new legislation for the waste management]

Quotation(s): 8

Box 3.6: Rules concerning sustainable practices within the organization, identified through the focus groups

Code Family: RULES

Total amount of codes: 12

Full list of codes: [After cassation the waste is delivered with official report to the administrative department] [By the collective labour agreement is stipulated that the managers have a working car] [Each head of department has a subscription for public transportation, which they can borrow for their subordinates during working hours] [Each head of department has different indicators depending on the work that it takes] [In each centre there is a different management of waste and recyclable materials, depending on the particular materials from locations] [New environmental policy in 2004] [Official correspondence by fax or mail] [Performance indicators which contribute to the economy of consumables] [There are officials of the Environmental Quality Department to do audits, and check the recyclable materials] [There is a regulation which forced the implementation of the monitoring of greenhouse gas emissions] [**There is specialized personnel for monitoring the implementation of legal provisions**] [We strictly respected the policy form 2004]

Quotation(s): 13

Box 3.7: Good practices occurring within the organization, identified through the focus groups

Code Family: GOOD PRACTICES

Total amount of codes: 86

Full list of codes: [**Selective collection of waste**] [Dangerous waste is incinerated by specialized companies] [Different treatment for the waste from production process than the household waste] [Reduce energy consumption by 30%] [**Reduced number of trips**] [Replacing older vehicles with new ones] [Some employees go to work with the same car] [There is a list developed by the Quality Environmental Service about all kinds of waste in the organization]

Quotation(s): 92

Box 3.8: Bad practices occurring within the organization, identified through the focus groups

Code Family: BAD PRACTICES

Total amount of codes: 14

Full list of codes: [Convenience] [Glass factories are closed] [Glass is heavy and has a low price] [In the area is not a selective collection of waste] [Light is switched on during the day in some offices] [Poor management for certain types of waste: glass, tires, rubber] [Some employees of local waste collection company, throw waste on the streets in the sewers, and they clog] [Some sewer caps are stolen and sold as scrap metal] [The local company for waste disposal, doesn't dispose waste selectively] [The local trash car does not lift the trash selectively] [There are insufficient bicycle parking spaces] [There are no sensors in the organization for water taps] [There is no chain of special waste disposal, there are no logistics for getting rid of waste] [Traveling each day from the city to a branch outside the city]

Quotation(s): 14

3.4 Document Analysis

3.4.1 Methods

To identify everyday practices at the workplace within Aquatim, we made an analysis of relevant organizational documents containing references to sustainable practices. The contents of these documents were used as Hermeneutic Units in the program ATLAS.ti. Specifically, the following documents were analysed:

- Environment Performance Indicators Sheet;
- The list of the environment goals for 2011;
- The list of the significant environment assets;
- Waste Disposal Plan and Report of the environmental inspection no. 2 of 17.03.2011.

The most relevant contents within each document were coded according to the principle “theme – area – statement”. For what it concerns the “themes” the following labels have been used: Bad practice, Good practice, Value, Suggestion, Consequences. For what it concerns the “areas” we have used short symbolic names for the area which the document’s passage refers to. The statements refer to quotations from the documents, rewritten in a shorter form within the codes.

In a final analyses, families of codes have been created; each family reflects a theme followed in documents and relevant for the present study; these families were then used as main outputs and content-analysed. We handled these information according to the same procedure previously described for the interviews with key informers. The codes were double checked by a second researcher, before running the analysis.

The information extracted from the documents can be summarized according to the following two main code categories: *Organizational and institutional elements* and *Material/Physical and Structural Elements*. A colour was assigned to each code category, according to same rationale mentioned in the previous paragraphs: light grey for the codes referring to the category of Organizational and Institutional Elements and black for the codes referring to the category of Material/Physical and Structural Elements.

3.4.2 Results

The results of the qualitative analyses of the relevant organizational documents considered are presented according to the main **themes** identified. These themes were focused on the contents referring to organisation’s values, rules, good practices and bad practices.

The results are summarized within three different boxes, separately for what it concerns *values, good practices and bad practices*. Each box contains the following information: the total amount of codes, the full list of codes (in bold the most frequent codes, more than 4 quotations) and the total amount of quotations coded with at least one code belonging to that Code family.

In particular:

- Box 3.9 reports the main organizational *values* referred to the major environmental performance indicators reported in the analysed documents.
- Box 3.10 reports the main current *good practices* occurring in the organization and the main environmental objectives achieved, as emerged throughout the analysed documents.
- Box 3.11 reports the main *bad practices* and environmental goals that are missing from the organizational practices, as emerged throughout the analysed documents.

Box 3.9: Values endorsed at the organizational level, identified through the document analysis

Code Family: VALUES

Total amount of codes: 7

Full list of codes:[The degree of achievement of environmental inspections: 100%] [The degree of achievement of quality of purified water monitoring program , discharged into the environment:100%] [The degree of achievement of specific environmental objectives: 90%] [The degree of achievement of waste water quality monitoring program discharged into the sewer by economic agents:78,40%] [The degree of assurance of disposal of waste in final repository 99,48%] [The degree of assurance of waste recovery: 96,07%] [The degree of realization of program of quality of drinking water monitoring, in the network: 100%]

Quotation(s): 7

Box 3.10:Good practices occurring within the organization, identified through the document analysis

Code Family: GOOD PRACTICES

Total amount of codes: 26

Full list of codes:[Waste from the activities of the organization are carried by vehicles of firms, by which is achieved the final disposal of waste] [Arrangement of spaces for the storage of recyclable materials] [Domestic waste is stored in a container of 240 litres, which is taken monthly] [Domestic waste is stored in EuroWaste cans of 20 l and 240 l , and in containers of 1.1 m3] [Improving quality for the discharged water] [Inspection report] [Large waste are disposed in fenced spaces, concrete platforms, partially covered] [Management of environmental resources] [Management of waste and hazardous substances] [Monitoring losses in water distribution network] [Monitoring solid waste] [Monitoring the quality of wastewater discharged to the sewer by economic operators] [Monthly monitoring of waste] [No source of air pollution] [Recovery of scrap metal and non-metallic] [Reduce electricity consumption by 0.5%] [Selective waste collection] [Selective waste collection in special places] [Small waste is disposed in containers for selective collection] [Temporary storage of existing waste and recyclable materials on site, in places appointed, or at the limit of property in separate containers] [To protect against noise and vibration, water pumps are placed on pedestals fitted with rubber sheet] [Training staff about the prohibition of burning waste and vegetable waste and any materials on site] [Training the personnel of treatment plant, about the separate waste storage] [Waste generated by human activities and production are monitored monthly at each working point separately] [Waste management records] [Waste recycling]

Quotation(s): 26

Box 3.11: Bad practices occurring within the organization, identified through the document analysis

Code Family: BAD PRACTICES

Total amount of codes: 8

Full list of codes: [Aerosol emissions, odour, gas fermentation. Microbiological pollutants emission into the atmosphere] [Discharge of untreated waste water into the environment] [Does not exist equipment to measure noise and vibration] [Gas emissions from cars] [Interim storage or handling of the waste, wastewater, polluted soil, mud channel] [Lack of chlorination station, of the pool of neutralizing chlorine loss, and proper ventilation for Sannicolau Mare] [Oil and fuel leaks from cars] [Risk of accidental pollution of air by chlorine leak]

Quotation(s): 19

3.5 Conclusions

On the basis of the results of the interviews with the key informers, one can observe that the answers to questions regarding consumption practices, reveal that the sustainable practices that are most often observed in the organisation are also the most valued by the organization. This suggests the importance attributed to sustainable consumption practices, both at an organizational and individual level. A similar pattern seemed to emerge for the waste related practices too: again, the most frequently observed practices in the organisation are those considered most important, both by the organization in general and by individual members, although the level of importance attributed by the single employees seems lower.

In the case of travel related practices, answers are much more heterogeneous. Here, it can be observed a lack of convergence within the three areas - observed practices, importance attributed by the organization and importance attributed by the single workers. In addition, the DO NOT KNOW answers showed up with higher frequency, mainly in relation to the importance that the organisation and the employees attribute to these practices.

Regarding saving practices at home, results show that the majority of respondents took measures to reduce energy, water or paper consumption, at home, during the past three years, the highest percentage being recorded regarding power saving. Differences in the answers regarding saving practices depending on some demographic and structural variables were also observed: male respondents reported saving measures more frequently compared to females; results show an upward trend of the percentages of respondents who have taken measures for power and water saving in relation to the age. Also, individuals with a monthly gross income higher than 970 EUR, reported to have taken saving measures for all three components, at a rate of 100%. Measures taken regarding savings differ depending on the level of education, thus secondary specialised school and technical school for craftsmen graduates, vocational, complementary and apprenticeship school graduates and PhD graduates are among those who stated at a rate of 100% that they have taken measures to this end during the past three years.

The percentage of the respondents who have taken measures towards an environment responsible waste reuse and waste management, at home, during the past three years, were quite high for the recycling and separate waste collection component, but just about half of the respondents stated to have taken measures regarding storage of products for reuse and low plastic products use. Depending on gender, age, income and educational level differences were recorded. The percentage of male respondents who stated to have taken measures regarding recycling and separate waste collection was higher than that of females. Respondents aged under 25 reported to have taken measures regarding recycling and separate waste collection and products storage for reuse. Individuals with an income above 1940 EUR answered, at a rate of 100%, that they have not taken measures towards recycling and separate waste collection and towards low plastic products use; instead they report to have taken measures towards products storage for reuse. Short term university graduates and vocational, complementary and apprenticeship school graduates reported to have taken measures towards recycling and separate waste collection, most frequent.

Regarding the level of personal related car use, only about half of the responses were affirmative ones. The highest percentage of respondents who reported to have taken measures towards decrease in the level of personal related car use are aged above 55, followed by those aged between 25 and 35. Regarding the increase of walking at the expense of car use, the percentage of females who gave an affirmative answer for this practice was higher than that of men. Results show that individuals with monthly incomes above 970 EUR have not taken measures towards decrease in the level of personal related car use compared to those with lesser income. Respondents who are secondary specialized school and technical school for craftsmen graduates reported to have taken measures towards decrease in the level of personal related car use, most frequent.

To summarize a general trend emerging from this qualitative analysis, it can be argued that most of the perceived barriers against adopting sustainable behaviours related to the responsible consumption of energy and other resources seemed to be placed at different levels: individual and collective human elements, sociocultural elements and also political, economic or institutional elements.

The main drivers mentioned for consumption behaviours seem more widely represented: they can be linked to organizational and institutional elements, discursive constructions of actors and popular discourses, political economic and institutional elements, material elements and spatial physical features and individual and collective human elements.

In the domain of waste generation and management, the most represented attitude towards the perceived barriers is that there are none. Our respondents indicated as barriers mainly factors related to individual and collective human elements, as well as sociocultural elements. The attempt to map the drivers for these waste collection sustainable behaviours brings up the same weird observed situation. The most important perceived facilitators for actions related to waste were selective waste collection.

In the domain of organisation-related mobility, the most frequently mentioned barriers seem to be linked to individual and collective human elements and organizational/institutional elements. The same phenomenon of polarity previously identified, the prevalence of the “potential disengagement” factors/attitude close after the most important factors, can also be observed here. The drivers for the responsible travel behaviours in the organisation seem to be related to factors pertaining to material elements and spatial physical features, organisational and institutional elements and political economic/ institutional elements.

Finally, for what it concerns the qualitative analysis of organisational documents, we can observe that the majority of present practices described in documents refer to waste management and to environment protection. The label “environment protection related practices” was taken from the documents and can lead to raise some questions regarding the preference for the use of this term of people who prepared the document. Actually, these practices contain a large set of sustainable practices, but they are all embedded under this name. It might reveal that relevant members of the organisation studied did not identify the sustainable practices in a specific manner, by categories related to waste management, power consumption, water saving, consumables saving, etc.. This concept indeed emerged also during a Focus Group discussion. In that Focus Group, the issue of sustainability was debated from a terminological point of view, and the majority of participants disapproved the use of this term. This might be then a crucial gap that future organizational policies in this domain might want to fill, in view of a wider promotion of more sustainable practices in the workplace.

4. ITALY

National report
CIRPA – Sapienza University of Rome

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4.1 Introduction

4.1.1 Short profile of the ENEL Green Power company

Here below we report some basic information concerning Enel Green Power (EGP), the company that was chosen as case-study for the research activities conducted by the Italian team. These information are taken from the official website of EGP.

Enel Green Power (EGP), founded in December 2008, is the Enel Group Company dedicated to developing and managing energy generation from renewable sources at an international level, with a presence in Europe and the American continent. In Europe, EGP operates in Italy (where it is the leader in three out of the four technologies on renewable energies: geothermal, hydroelectric and solar), Spain, France and Greece. Major projects are also under way in a number of countries in Eastern Europe. In addition, EGP operates in the United States and Canada, primarily in the form of hydroelectric plants and wind farms, and in Central and South America, primarily in the form of hydroelectric plants.

Enel Green Power is world leader in this sector, with almost 21 TW/h produced every year, covering the energy consumption of about 8 million families, avoiding 16 million tons of CO₂ emissions every year.

EGP is committed to contributing to sustainable development. Italy is the fourth largest user of renewable energy in Europe. Alternative sources account for 15% of energy generated, and this percentage should significantly increase over the next few years.

In the future years, Enel Green Power aims at increasing its installed capacity and boosting development along the value chain, also via strategic partnerships with world-class technological benchmarks. Enel Green Power generates power from all renewable resources, with a vast, balanced portfolio of plants using wind, hydroelectric, geothermal, solar and biomass power. Each of these aspects are below described with more detail.

Solar energy

The gradual rise in global temperatures and the instability of fossil fuel markets are driving the development of solar power throughout the world, particularly in the area of photovoltaic technologies. In the solar sector, Enel Green Power can count upon Italian competence thanks to the Enel.si franchising model, the Catania based research centre. Italy is currently one of the fastest growing photovoltaic markets, thanks to high natural levels of sunlight and high incentives to development. EGP also operates the SerrePersano (Salerno) plant, one of the world's largest photovoltaic facilities.

In the area of advanced technologies, Enel has begun testing of solar thermal generation with Archimede Project of EGP, which has been realized at the PrioloGargallo (Syracuse) plant. This is the world's first example of a combined-cycle gas plant integrated with a solar plant, based on a highly innovative technology developed by Enea.

Wind energy

In Italy, wind power has been the fastest growing source of energy over the last decade. Within such a context, Enel Green Power has made a significant contribution to this growth. Starting with Italy's first wind farm, which Enel built in Alta Nurra (Sardinia) in 1984, EGP now operates with a total of 31 wind farms.

Enel Green Power is planning to maintain the company's commitment to the environment, continuing to place the utmost importance on ensuring that the wind farms are in harmony with the surrounding area and boosting local communities, also pursuing innovation and the new frontiers of wind power, such as off-shore plants. For the plants currently under construction, Enel's guidelines call for the

design of layouts that are environmentally compatible, with an appropriate number of wind turbines for the area concerned.

Hydroelectricity

EGP operates 288 water flow plants across the country. This typology allows for minimal impact on the local environment, can be managed even in small communities, and allows multiple uses, in accordance with available water resources. Hydroelectric power generation is a highly important industry segment worldwide. In Italy, it accounts for approximately 15% of the country's power needs, thanks to Enel's crucial commitment to developing know-how that has made the company a world leader in the development of this clean, renewable and cost-effective source of energy.

Nearly all of Europe's hydroelectric potential is currently being utilized. For this reason, EGP is looking with particular interest at the development of "run-of-the-river" hydro power, which, despite having a limited power output per plant, could, on the whole, make a significant contribution to meeting electricity demand.

The role of mini-hydro is being further enhanced by the growing need to protect the environment. Indeed, small-scale hydroelectric plants have construction and organizational features that limit their environmental impact. In addition, they can be managed by smaller communities and integrated into a balanced, multiple-use water system.

Currently, Enel Green Power operates more than 250 hydroelectric facilities in Italy, making a concerted effort to ensure the safety and maintenance of the hydroelectric sites.

Geothermal energy

Italy is the country where geothermal energy was used for the first time for industrial purposes, and the country remains one of the leading producers of geothermal electricity. The EGP company has 33 geothermal plants, located in Tuscany (in the area of Larderello, Pisa, but also in the area of Val di Cecina and in the area of Mt. Amiata). This "Made in Italy" geothermal power technology has now become a worldwide export for EGP. Further development of geothermal power generation in Italy is an important part of Enel Green Power's strategy.

Biomass

The exploitation of biomass is an important chapter in Europe's development of renewable energy. This resource is expected to make a significant contribution in the production of electricity, heat and biofuels, with the latter being the leading alternative to the use of fossil fuels for transportation. Enel Green Power intends to contribute to the development of the biomass energy industry in Italy.

Two projects are already under way: the conversion of the Mercure thermal plant (Basilicata) to biomass and the installation of a new thermal unit at the Sulcis plant (Cagliari) that will be able to use plant waste for fuel.

4.2 Interviews with key Informers

4.2.1 Methods

Consistently with what previewed in the original project, a total of 10 semi-structured interviews were administered. Participants' Answers were subject to qualitative content analysis.

The participants were recruited in accordance with the management EGP company, after two operative meetings that occurred between the CIRPA research staff and EGP Human resources management staff.

A particular attention was used in order to assure also an adequate differentiation also in the work role and responsibilities of the interviewed persons. These were all people inserted in high management roles, but coming from different professional and educational backgrounds. EGP's key informers were all men, balanced for their age: under 35 = 2; 40-45 = 4; 45-50 = 3; over 60 = 1.

Each interview lasted 30-45 minutes and it was audio-recorded and transcribed in MS Word.

The interviews were conducted using the same instrument already described for the Spanish and Romanian research teams, and translated in Italian.

4.2.2 Results

4.2.2.1 Descriptive analyses of the main trends emerging from participants' answers

Due the number of respondents (N=10), in this preliminary qualitative phase of the research, answers to each item were summed across the various categories of sustainable practices.

In general, the main trends emerged from the answers of our key informers are showed in tables 4.1, 4.2, and 4.3.

With respect to the practices that the interviewed person had observed (Table 4.1), consumption-related practices were observed with a greater frequency, compared to waste-related practices, which were observed many times only by 40% of informers.

For what it concerns the importance assigned to the sustainable practices within the whole EGP company (see Table 4.2), according the answers of our key informers both consumption- and travel-related practices emerge as more frequent practices. A lower level of accordance seemed to emerge for what it concerns waste-related practices.

As far as the importance concerned by the workers to the practices, according to the 70% of our key informers, people working in EGP assign a high level of importance to consumption-related practices (see Table 4.3).

Table 4.1. Amount of sustainable practices observed by EGP Key informers

	(a) Practices you have observed			
	Doesn't exist	Sometimes	Many times	Always
1 CONSUMPTION RELATED PRACTICES		20%	60%	20%
2. WASTE-RELATED PRACTICES	10%	20%	40%	30%
3. TRAVEL-RELATED PRACTICES		50%	50%	

Table 4.2. Importance concerned to the sustainable practices by EGP according to the Key informers

	(b) Importance conceded by this company			
	None	A little	Quite a lot	A lot
1 CONSUMPTION RELATED PRACTICES		10%	60%	30%
2. WASTE-RELATED PRACTICES	10%	20%	30%	40%
3. TRAVEL-RELATED PRACTICES		30%	60%	10%

Table 4.3. Importance concerned to the sustainable practices by people working in EGP according to the Key informers

	(b) Importance conceded by people working in this organization			
	None	A little	Quite a lot	A lot
1 CONSUMPTION RELATED PRACTICES		20%	70%	10%
2. WASTE-RELATED PRACTICES	10%	20%	40%	30%
3. TRAVEL-RELATED PRACTICES		50%	50%	

For what it concerns the results about the change of participants's practices at home or in other everyday place, the 90% of informers reported to have changed their sustainable practices (see Figure 4.1).

In particular, as reported in Figure 4.2, most of them (89%) reported to have changed their practices related to Energy saving; while a lower percentage reported to have changed their practices related to paper and water saving.

Figure 4.1. Percentage of EGP respondents who said they have changed sustainable practices.

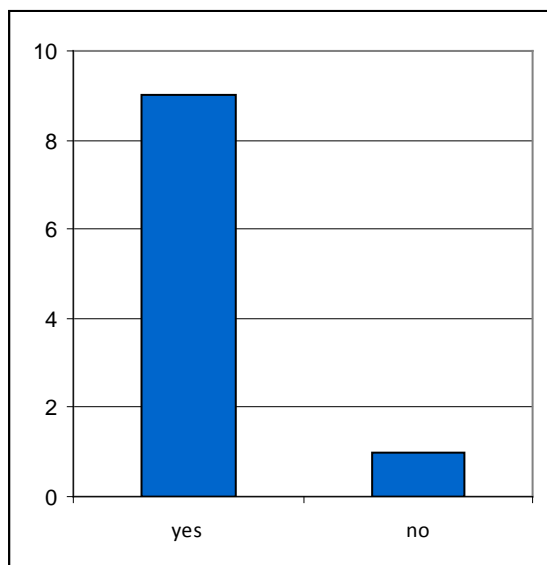
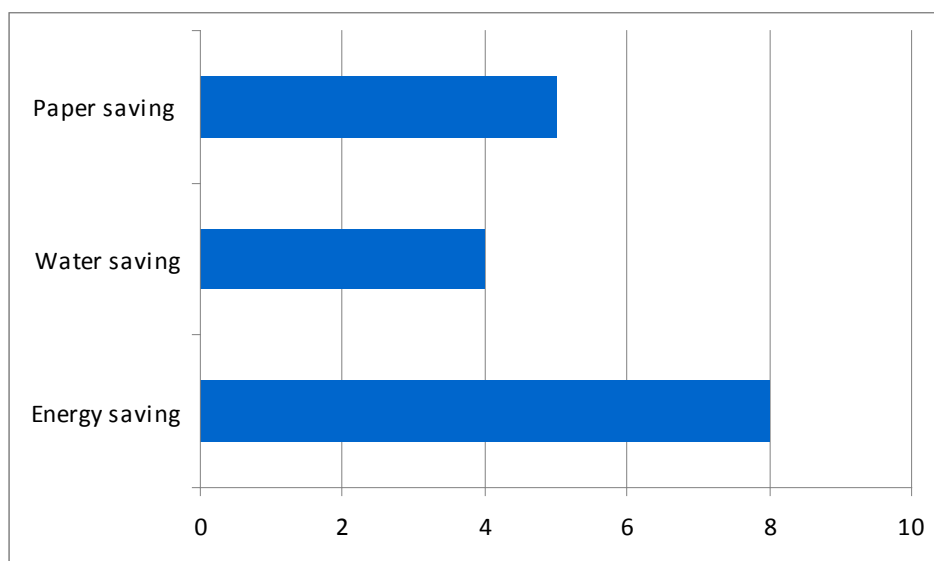


Figure 4.2. Percentage of EGP respondents who said they have changed practices in the areas of energy, paper and water saving.



For what it concerns waste management practices (see Figure 4.3), only the 40% reported to have changed practices of waste recycling or separation, and few or no participants declare to have reduced their use of plastic or reuse of products.

Concerning the mobility practices (see Figure 4.4), 4 informers out of 10 said to have chosen to walk more than use car, and 2 or 1 informers said to have reduced their travels or airplane use.

Figure 4.3. Percentage of EGP respondents who said they have changed practices in the areas of waste managing

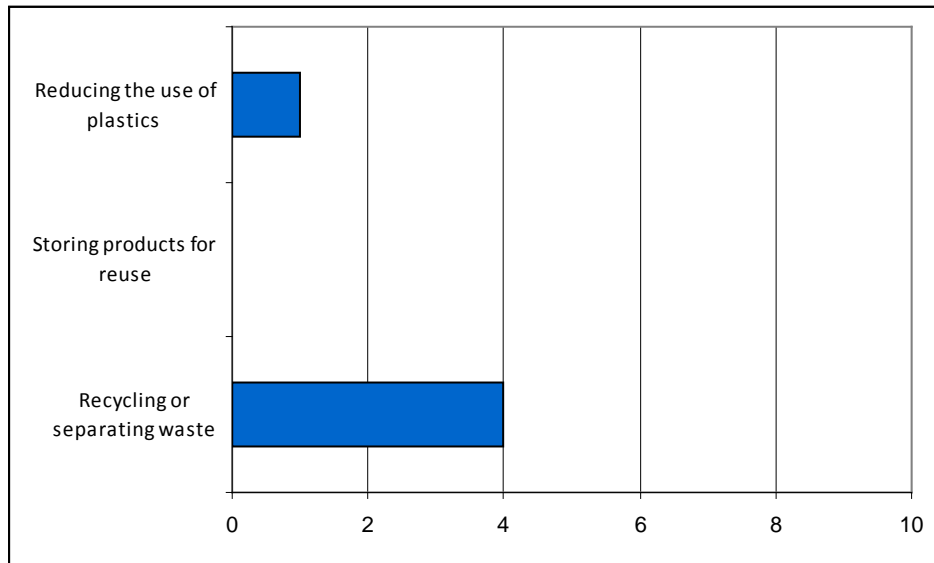
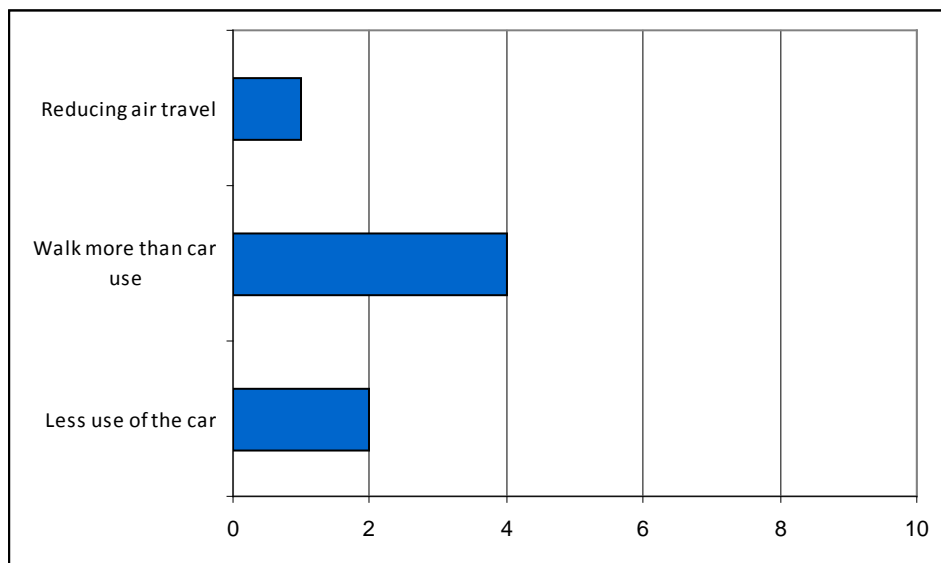
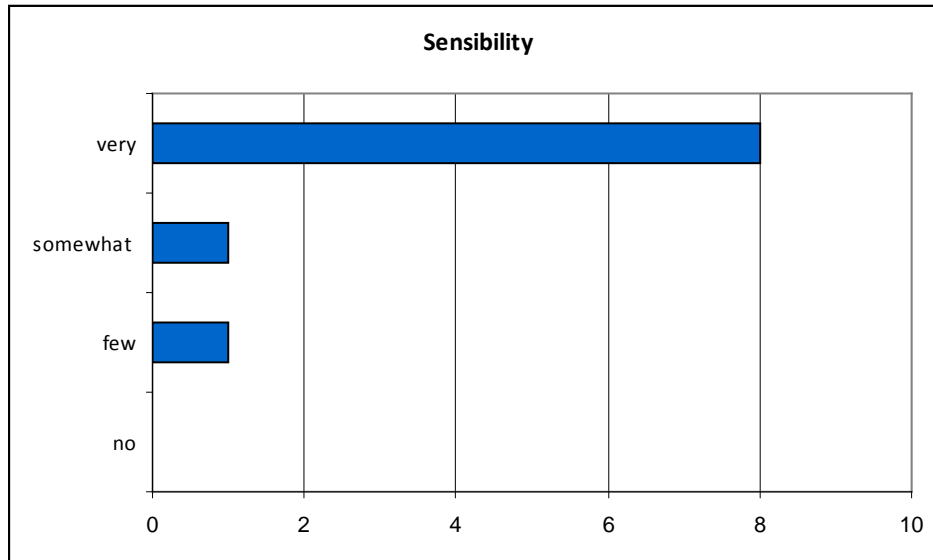


Figure 4.4. Percentage of EGP respondents who said they have changed practices in the areas of mobility



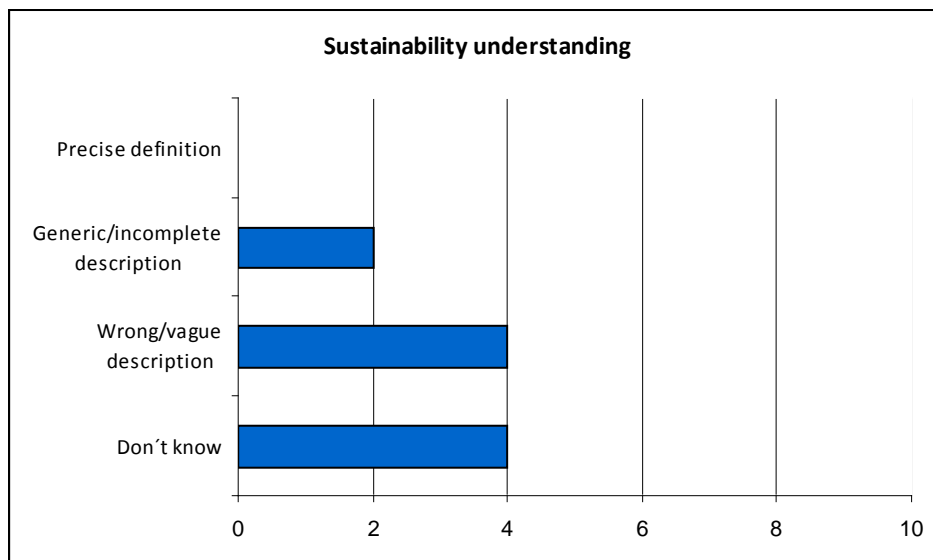
Concerning the reported knowledge about the sustainability issues, the vast majority of our key informers declare to be very sensitive to the issues of sustainability and climate change (see Figure 4.5).

Figure 4.5. Personal sensibility of EGP informers regarding the issues of sustainability and climate change



Concerning the understanding and the judgement about the clarity of the concept of sustainability, the main results are summarised in figure 4.6

Figure 4.6. Personal understanding and knowledge of EGP informers regarding the issues of sustainability and climate change



4.2.2.2 Qualitative analyses of the contents of the open-ended questions from the interviews with key informers

Table 4.4 shows the codes assigned to the textual material gathered through the open-ended questions from the interviews with the key informers. The codes are reported in the columns, while the role of the interviewed person are reported in row.

Each cell reports the number of quotations coded with each code. To facilitate the legibility of table, only the codes with at least 6 quotations in total are reported in the table 4.4.

This table also allows a preliminary assessment of the distribution of the most meaningful codes emerged across transcribed interviews.

WP2 – Deliverable 2.2: Diagnosis of Everyday Practices of Production and Consumption

Table. 4.4: qualitative analyses of the open-ended questions in the interviews with key informers

Job role and main responsibility	Values_ Practices rely on individual feeling	Attitudes_ Mobility in EGP need an improvement rules_ the organization has an active role in shaping individual behaviors	Working in EGP sensitizes people	Attitudes_ Good practice at work become a mental attitude	Good practice_ Wide use of e-conference	Good practice_ Waste separation for paper and plastic_	Working in EGP strengthens pro-environmental	Good practice_ Printing of documents only if necessary	Good practice_ Waste separation for spent ink cartridges	Attitudes_ In ENEL there is a custom to save energy	Communication strategies for save energy could be
External relations	2	0	0	0	2	1	0	0	1	0	0
Operation support - safety	1	0	2	0	5	1	0	1	1	3	2
Industrial relations	3	0	2	1	1	1	0	2	1	0	0
Planning	0	1	1	0	0	1	0	1	1	1	0
Planning and control	0	1	2	4	0	1	5	1	1	0	0
Development for Italy	1	2	0	1	0	1	1	0	0	0	0
Coordination	0	2	1	1	0	0	1	2	0	1	2
Information Technology	1	1	0	2	0	1	0	0	1	0	0
Engineering	0	2	0	0	0	0	0	0	0	0	0
Energy management	2	0	0	0	0	1	0	0	0	1	2
TOTALS:	10	9	8	9	8	8	7	7	6	6	6

4.3 Focus Group

4.3.1 Methods

Our main aim in the focus group was to explore perceptions, attitudes and evaluations of people working in EGP, in relation to individual and organizational (un)sustainable practices.

Participants were invited to join in the discussion, expressing their point of view, with the coordination and stimulation of a non-directive moderator, who had the role of ensuring that all members have the possibility to speak in a manner free from critiques and formal evaluations, and that all points of interest are covered in an exhaustive way.

To do so, the moderator have used a guideline which was developed and described in the previous deliverable D.2.1. It was composed by a list of topics to be discussed consistently with the main research objectives.

In the specific case of the present research, the focus groups have discussed those specific behaviours related to the 3 macro categories forming the core area of the LOCAW project, and performed by the subjects in their everyday working practices:

1. Use and consumption of materials and energy;
2. Waste generation and management;
3. Organization-related travel.

Participants were 10 persons working in EGP. As in the case of the interviews with key informers, the composition of the group was defined in accordance with the management EGP company, after the preliminary operative meetings.

All participants were requested to read and sign a letter for informed consent to participate and audio-recording, prior to the beginning of the discussion.

Participants differed for their relative work experience and field of activity. Their age range from 28 to 57 years. Six participants are men and 4 women.

Their seniority range from 1 year to 37.

Nobody declared to be member of any particular environmentalist association, neither member of a specific trade union.

4.3.2 Results

The qualitative analysis of the focus group confirms the relevance of the individual level in the decision of adopting sustainable practices in the workplace.

In fact, as reported in table 4.5, among the most quoted codes we can find: *Practice rely on individual feeling* (above described) and *Proactive sustainability*. This last concept, in particular, represents the expressed beliefs about the necessity for each person to carry on one's own sustainable actions; we decided to adopt the term "proactivity", since we believe that it can well describe the link with the personal feeling of responsibility and individual intentionality that emerged from the discourses made by the participants to the focus group.

Table 4.5: Codes included in the analysis of focus group
CODES

Values_ Practices rely on individual feeling	3
Rules_ The organization has an active role in shaping individual behaviours	1
Values_ Organizational actions meet sustainability when they match individual sensitivity	2
Good practice_ Car sharing/Car pooling to go to work	1
Good practice_ The organization should provide an "environmental education"	2
Good practice_ Proactive sustainability	3
Good practice_ ENEL has a team specialized in mobility	1
Rules_ None for separation of spent batteries	1
Values_ Trial telecommuting system to improve Corporate Social Responsibility	1
Values_ People have to know the impact of actions and inactivity	2
Values_ Reciprocity precedes pro-environmental behaviours	1
Good practice_ Organizational communicative strategies to save resources	2
Attitudes_ Organization doesn't put any barrier to pro-environmental behaviours	2
Values_ Each person conveys pro-environmental values in his own family	2
Good practice_ Sometimes good practice and individual responsibility have opposite effects	1
Attitudes_ Sustainability doesn't mean to use the bus to go to work	1
Attitudes_ More information about mobility opportunities (shuttle)	1
Attitudes_ Saving light bulbs produce more pollution than traditional bulbs	1
Attitudes_ Proposal of e-working to reduce consumptions for mobility in big cities	1
Attitudes_ People are lazy, organizations have to overcome their laziness	1
Values_ Ethic and motivation to act in a sustainable manner are the same thing	1
Values_ Organization does not perceive individual efforts and actions	1
Rules_ Opinion leaders as examples and communication	1
Attitudes_ Sustainability has two faces: consumption and management consumption's products	1
Good practice_ Exercising discretionary role to behave virtuously	1
Attitudes_ In little offices it is easier to act virtuously	1
Totals	36

4.4 Document analysis

4.4.1 Methods

To perform the document analyses, we relied on public material present in the EGP, as well as on printed informative material made available by the management of the company during the preliminary meetings.

In particular, these consisted in documents such as brochures, promotional and advertising flyers, environmental and social reports, codes of ethics etc. These are all documents speaking about the company and its positioning toward the internal and external stakeholders, besides the information about the three main areas of interest for the LOCAW project.

In these documents, it was possible to find significant information about the declared value dimensions, about the inter-organization relations considered as significant by the company itself, as well as about the formal rules characterizing the everyday practices and constraining individual action. This whole corpus of information can be particularly relevant because we assume that it might be related to both individual and collective rights and duties, as well as to the personal facilitators or obstacles that individuals encounter when performing their everyday actions in the workplace.

With respect to the three main behavioural dimensions addressed by LOCAW, we expected the document analysis to provide meaningful information about the actions considered desirable at the organizational level, and about the formal regulations related to such desired practices.

4.4.2 Results

On one hand, the analysis of the documents seems to provide a wide corpus of very technical information. On the other hand, many cultural and strategic aspects related to the sustainable practices can be identified, and therefore described and discussed.

As described in table 4.6, these contents are mainly organized into the frame of the company's organizational mission, of the company's advanced research technologies, as well as on the company's innovation and social policies. In particular, the majority of the salient contents identified within and across the material analysed seem to refer to the issue of values, mainly declined at the collective level of the entire company.

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Table 4.6: Thematic Codes identified from the document analysis of focus group

CODES	document source number						99
	1	2	3	4	5	6	Totals
Attitudes							
CCS technologies does not reach a commercial full development	1	0	0	0	0	0	1
Need for optimization and integration with existing equipments	1	0	0	0	0	0	1
Using hydrogen as combustible produces nitrogen oxide	1	0	0	0	0	0	1
Good practice							
New technologies and research for Carbon Capture and Storage	1	0	0	0	0	1	2
Research in partnership with Italian and foreign outstanding institutions	3	0	0	1	0	0	4
Spread of projects and adherence to international rules	0	0	0	0	0	1	1
Rules							
Laws are not enough for individual change and local policies about saving	0	1	0	0	0	0	1
Values							
A balance between economic issues and environmental concerns	0	0	0	1	0	0	1
Agreement between ENEL and National Association of Municipalities	0	1	0	0	1	0	2
Climate strategy as long term vision	0	0	0	0	0	1	1
ENEL's competitiveness in renewable energy	0	0	0	0	0	1	1
ENEL activities have a direct influence on communities where it operates	0	0	0	1	0	0	1
Guidelines for executives in public institutions	0	1	0	0	0	0	1
Municipalities give good examples performing virtuous behaviours	0	1	0	0	0	0	1
Respect for local and national communities and social values	0	0	0	1	0	0	1
Responsibility, joint involvement and opportunity for local development	0	0	0	0	1	0	1
Suggestions to choose household electrical appliances	0	0	1	0	0	0	1
Sustainable use of energy for external stakeholder	0	1	0	0	0	1	2
The duty of ENEL is to find best solutions to provide sustainable energy	0	0	0	0	0	1	1
Totals	7	5	1	4	2	6	25

Note: document source numbers: 1 = EGP Programme "Zero Emissions"; 2 = EGP Guidelines for Municipalities; 3: EGP Document about energy saving; 4 = EGP Code of ethics; 5 = EGP Document on small municipalities and innovation for energy; 6 = EGP sustainability balance

4.5 Overall content analyses conducted on the aggregated data sources

After having analysed and described the results of the content analyses conducted separately for each of the three data sources considered (interviews, focus group, document analyses) the next section will present and discuss the results of a further content analysis, conducted on a overall data set, obtained by grouping together all the textual material from the three data sources.

In particular, this section will describe the main codes emerged in relation to the thematic areas identified in the previous analyses, on the basis of the main problematic areas defined in the original project.

In total we have identified 28 themes, including general (such as, for example, Attitudes, Rules, Good practice and Values) and specific topics (drivers and barriers at both the individual and organizational level, spill over effects) put forward in the main rationale of the LOCAW project.

In the boxes presented in the next pages, we report the main relevant themes identified from these aggregated results. Each theme corresponds to a so-called “Code family” defined through the use of the software ATLAS.ti.

For each theme, in the following boxes we will report the following information:

- The total amount of codes;
- The total amount of quotations coded with at least one code belonging to that theme
- The full list of codes that appear in at least two quotations (in bold most frequent codes);

In particular:

Box n. 4.1 shows codes belonging to the main theme “*Attitude*”;

Box n. 4.2 shows codes belonging to the main theme “*Good practices*”;

Box n. 4.3 shows codes belonging to the main theme “*Rules*”;

Box n. 4.4 shows codes belonging to the main theme “*Values*”;

Box n. 4.5 shows codes belonging to the main theme “*Barriers at the individual level*”;

Box n. 4.6 shows codes belonging to the main theme “*Barriers at the organizational level*”;

Box n. 4.7 shows codes belonging to the main theme “*Drivers at the individual level*”;

Box n. 4.8 shows codes belonging to the main theme “*Drivers at the organizational level*”;

Box n. 4.9 shows codes belonging to the main theme “*Spillover*”;

According to the general rationale of the LOCAW project, we assigned a strong emphasis on the potential drivers and barriers that the individual may encounter in the performance of sustainable practices at work. Furthermore, as already mentioned, the main categories identified for drivers and barriers to sustainable practices are divided between individual and collective factors.

Finally, an important issue that we aimed at focusing in this project refers to the exploration and understanding of the potential spill over actions from workplace to home. A specific theme was then identified in relation to this issue. To this extent, it is interesting to note that many of the codes belonging the “Spill over” theme are shared with the other above-mentioned themes.

Box n. 4.1 – Main attitudes identified from the analysis of the three aggregated data sources

Code family: ATTITUDES

Total amount of codes: 47

Total amount of quotations coded with at least one code belonging to that theme = 92

Full list of codes

[Time is a barrier for sustainable mobility] [Barrage about environmental pollution footprint] [Barriers due to waste separation in the city] [Car parks are expensive] [CCS technologies does not reach a commercial full development] [**Communication strategies for save energy could be improved**] [Cultural barriers to act pro-environmental behaviours] [Easily you can access to technologies, easily perform good practices] [EGP has to improve the development of e-conference] [ENEL direct its campaign to the customers] [Flying with low emission companies] [**Good practice at work become a mental attitude**] [In EGP there is attention to save energy but there is some areas to improve] [**In ENEL there is a custom to save energy**] [In little offices it is easier to act virtuously] [In open space the temperature regulation is not bad] [In open spaces the temperature regulation is really bad] [Lack of information about the recycling die defeat individual efforts] [Marginal consumption of water] [**Mobility in EGP need an improvement**] [More information about mobility opportunities (shuttle)] [More than one base into the city function as barrier] [My travel along long distances doesn't change the level of emissions] [Need for optimization and integration with existing equipment] [No automatic switch off of lights at work] [No barriers to waste separation] [No spill over about mobility to go to work] [No spill over about waste separation at home] [Obstacles are due to the structure of work spaces] [Organization doesn't put any barrier to pro-environmental behaviours] [People are lazy, organizations have to overcome their laziness] [Producing sustainable energy has environmental costs] [Proposal of e-working to reduce consumptions for mobility in big cities] [Proposal to separate waste into each office] [Reduction of paper consumption at home] [Saving light bulbs produce more pollution that traditional bulbs] [Spill over doesn't rely on organization] [Sustainability as concrete action to separate waste] [Sustainability as consistency and respect to the nature] [Sustainability doesn't mean to use the bus to go to work] [Sustainability has two faces: consumption and management consumption's products] [Sustainability is a familial term] [The use of scooter to go to work] [Too much use of paper] [Troubles in mobility are due to the city] [Using hydrogen as combustible produces nitrogen oxide] [Young colleagues pay more attentions to pro-environmental themes]

Box n. 4.2 – Main good practices identified from the analysis of the three aggregated data sources

Code family: GOOD PRACTICES

Total amount of codes: 66

Total amount of quotations coded with at least one code belonging to that theme = 150

Full list of codes

[A business unit take care of vehicles maintenance] [Attention to work spaces to avoid empty spaces] [Automatic closing of doors to keep temperature] [Automatic deactivation of electrical systems] [Awareness campaign to reduce travels] [Buying a low emission car] [Car sharing/Car pooling to go to work] [Communication and action define ENEL as a perfect organization for proenvironmental issues] [Control of switch off lights when out of office] [Control of switching off lights and computer at the end of work day] [Diffusion of laptops to save energy] [E-conference systems need to be improved] [ENEL and ATAC agreement for discounts in city mobility] [ENEL has a team specialized in mobility] [Estimate of emission reduction with saving behaviours] [Exercising discretionary role to behave virtuously] [From home to work and not vice versa] [In latest years there is a growing attention to save resources] [In some office you can switch off air conditioning, in other offices not] [Information about proenvironmental practices is driver and barrier] [Initiatives and incentives to reduce emissions] [It is difficult to plan initiatives to sensitize public awareness of sustainability] [Just some colleague acts virtuously saving energy] [Maximal use of natural light] [Maximizing the use of cooperative work with technologies] [Multiple and diffuse wastepaper basket] [New technologies and research for Carbon Capture and Storage] [No proenvironmental behaviors about mobility] [Non autonomous regulation of air conditioning system to avoid wasting] [Organization (should) encourage virtuous behaviors] [Organization encourages the use of public transport for mobility] [Organizational action is effective just when it meets individual value and responsibility] [Organizational campaign for waste separation] [Organizational communicative strategies to save resources] [People save energy at home to save money] [People use e-conference to save money and avoid movements] [Printing mode in energy saving] [**Printing of documents only if necessary**] [Proactive sustainability] [Proposal for a better management of printing] [Recycling of printed paper] [Reducing water consumption] [Research in partnership with Italian and foreign outstanding institutions] [Shared printers in common spaces] [Sometimes good practice and individual responsibility have opposite effects] [Spread of projects and adherence to international rules] [Standby PCs when not used] [Switching off machines to preserve them, not to save energy] [The organization should provide an "environmental education"] [The use of energy saving light bulbs at home] [There is a tendency to decrease the use of printed paper] [Trying to reduce mobility] [Turn off when stopping to the traffic light] [Use both recycled and unrecycled paper] [Use of different transports according to needs] [Use of energy saving light bulbs] [Use of public transports to go to work] [Using electronic formats] [Using public transports reduce both costs and emissions] [Virtual environments to reduce energy waste] [Waste separation at home] [**Waste separation for paper and plastic**] [Waste separation for spent ink cartridges and other toxic waste] [**Wide use of e-conference with distant colleagues and manager**] [Wide use of waste separation]

Box n. 4.3– Main rules identified from the analysis of the three aggregated data sources

Code family: RULES

Total amount of codes: 11

Total amount of quotations coded with at least one code belonging to that theme = 26

Full list of codes

[International rules to hold down costs] [Laws are not enough for individual change and local policies about saving energy] [Non autonomous regulation of air conditioning system to avoid wasting] [None for separation of spent batteries] [Opinion leaders as examples and communication to reinforce pro-environmental behaviors] [Pressure to conformity toward good practices at work] [Printing of documents only if necessary] [Step by step implementation of e-conference sites] [**The organization has an active role in shaping individual behaviors**] [Use of unrecycled paper just for formal external communication] [Waste separation for spent ink cartridges]

Box n. 4.4– Main values identified from the analysis of the three aggregated data sources

Code family: VALUES

Total amount of codes: 37

Total amount of quotations coded with at least one code belonging to that theme = 92

Full list of codes

[A balance between economic issues and environmental concerns] [A number of strategies to save energy at home] [Agreement between ENEL and National Association of Municipalities] [Climate strategy as long term vision] [Each person conveys proenvironmental values in his own family] [EGP should provide a full range of solution for mobility] [Values_ ENEL's competitiveness in renewable energy] [ENEL activities have a direct influence on communities where it operates] [ENEL has certificate for environmental responsibility] [ENEL promotes healthy life styles and it take care of safety] [ENELSi worked a lot to sensitize internal and external stakeholders] [Ethic and motivation to act in a sustainable manner are the same thing] [Guidelines for executives in public institutions] [Inconsistency between organizational mission and everyday practice] [Municipalities give good examples performing virtuous behaviors] [Organization does not perceive individual efforts and actions to reach sustainability] [Organization encourages policies of consumptions reduction] [Organization has an active role and pay attention to mobility issues] [**Organizational actions meet environmental sustainability when they match individual sensitivity**] [People have to know the impact of actions and inactivity] [People should reduce consumptions as benefit for future generation] [**Practices rely on individual feeling**] [Proenvironmental behaviors are habitual, do not need drivers] [Reciprocity as driver for proenvironmental behavior] [Reciprocity between individuals and organization precedes proenvironmental behaviors] [Respect for local and national communities and social values] [Responsibility, joint involvement and opportunity for local development] [Saving water at home] [Searching for innovative solutions to avoid consequences on environment] [Some people give less importance to good sustainable behaviors] [Suggestions to choose household electrical appliances] [Sustainable use of energy for external stakeholder] [The duty of ENEL is to find best solutions to provide sustainable energy] [Trial telecommuting system to improve Corporate Social Responsibility] [**Working in EGP sensitizes people awareness of environmental issues**] [**Working in EGP strengthen individual proenvironmental behaviors**]

Box n. 4.5– Main Barriers at individual level identified from the analysis of the three aggregated data sources

Code family: INDIVIDUAL BARRIERS

Total amount of codes: 9

Total amount of quotations coded with at least one code belonging to that theme = 16

List of codes

[Attitudes_ Car parks are expensive] [Attitudes_ **Lack of information about the recycling die defeat individual efforts**] [Attitudes_ **No spill over about waste separation at home**] [Attitudes_ Organization doesn't put any barrier to proenvironmentalbehaviors] [Attitudes_ Time is a barrier for sustainable mobility] [Attitudes_ Too much use of paper] [Good practice_ No proenvironmentalbehaviors about mobility] [Good practice_ Sometimes good practice and individual responsibility have opposite effects] [Values_ Some people give less importance to good sustainable behaviors]

Box n. 4.6– Main organizational barriers identified from the analysis of the three aggregated data sources

Code family: ORGANIZATIONAL BARRIERS

Total amount of codes: 20

Total amount of quotations coded with at least one code belonging to that theme = 34

List of codes

[Attitudes_ Barriers due to waste separation in the city] [Attitudes_ CCS technologies does not reach a commercial full development] [Attitudes_ **Communication strategies for save energy could be improved**] [Attitudes_ Cultural barriers to act proenvironmentalbehaviors] [Attitudes_ In open space the temperature regulation is not bad] [Attitudes_ In open spaces the temperature regulation is really bad] [Attitudes_ More than one base into the city function as barrier] [Attitudes_ Need for optimization and integration with existing equipment] [Attitudes_ No automatic switch off of lights at work] [Attitudes_ No barriers to waste separation] [Attitudes_ Obstacles are due to the structure of work spaces] [Attitudes_ Producing sustainable energy has environmental costs] [Attitudes_ **Troubles in mobility are due to the city**] [Attitudes_ Using hydrogen as combustible produces nitrogen oxide] [Good practice_ Information about proenvironmental practices is driver and barrier] [Good practice_ It is difficult to plan initiatives to sensitize public awareness of sustainability] [Rules_ Laws are not enough for individual change and local policies about saving energy] [Rules_ None for separation of spent batteries] [Values_ Inconsistency between organizational mission and everyday practice] [Values_ Organization does not perceive individual efforts and actions to reach sustainability]

Box n. 4.7– Main individualdrivers identified from the analysis of the three aggregated data sources

Code family: INDIVIDUAL DRIVERS

Total amount of codes: 6

Total amount of quotations coded with at least one code belonging to that theme = 21

List of codes

[Good practice_ Exercising discretionary role to behave virtuously] [Good practice_ People save energy at home to save money] [Good practice_ Proactive sustainability] [Values_ **A number of strategies to save energy at home**] [Values_ Reciprocity as driver for pro-environmental behavior] [Values_ **Working in EGP sensitizes people awareness of environmental issues**]

Box n. 4.8– Main organizational drivers identified from the analysis of the three aggregated data sources

Code family: ORGANIZATIONAL DRIVERS

Total amount of codes: 44

Total amount of quotations coded with at least one code belonging to that theme = 117

List of codes

[Attitudes_ Easily you can access to technologies, easily perform good practices] [Attitudes_ In EGP there is attention to save energy but there is some areas to improve] [Attitudes_ In ENEL there is a custom to save energy] [Attitudes_ Sustainability is a familial term] [Attitudes_ Young colleagues pay more attentions to proenvironmental themes] [Good practice_ A business unit take care of vehicles maintenance] [Good practice_ Attention to work spaces to avoid empty spaces] [Good practice_ Communication and action define ENEL as a perfect organization for proenvironmental issues] [Good practice_ Diffusion of laptops to save energy] [Good practice_ ENEL and ATAC agreement for discounts in city mobility] [Good practice_ ENEL has a team specialized in mobility] [Good practice_ In latest years there is a growing attention to save resources] [Good practice_ Information about proenvironmental practices is driver and barrier] [Good practice_ Multiple and diffuse wastepaper basket] [Good practice_ New technologies and research for Carbon Capture and Storage] [Good practice_ Non autonomous regulation of air conditioning system to avoid wasting] [Good practice_ Organization encourages the use of public transport for mobility] [Good practice_ Organizational action is effective just when it meets individual value and responsibility] [Good practice_ Printing of documents only if necessary] [Good practice_ Proposal for a better management of printing] [Good practice_ Recycling of printed paper] [Good practice_ Reducing water consumption] [Good practice_ Shared printers in common spaces] [Good practice_ There is a tendency to decrease the use of printed paper] [Good practice_ Use both recycled and unrecycled paper] [Good practice_ Use of energy saving light bulbs] [Good practice_ Virtual environments to reduce energy waste] [Good practice_ **Waste separation for paper and plastic**] [Good practice_ Waste separation for spent ink cartridges and other toxic waste] [Good practice_ Wide use of waste separation] [Rules_ Non autonomous regulation of air conditioning system to avoid wasting] [Rules_ Opinion leaders as examples and communication to reinforce proenvironmental behaviors] [Rules_ **Printing of documents only if necessary**] [Rules_ **The organization has an active role in shaping individual behaviors**] [Rules_ Use of unrecycled paper just for formal external communication] [Rules_ Waste separation for spent ink cartridges] [Values_ Agreement between ENEL and National Association of Municipalities] [Values_ ENEL promotes healthy life styles and it take care of safety] [Values_ Municipalities give good examples performing virtuous behaviors] [Values_ Organization encourages policies of consumptions reduction] [Values_ Organization has an active role and pay attention to mobility issues] [Values_ Proenvironmental behaviors are habitual, do not need drivers] [Values_ Trial telecommuting system to improve Corporate Social Responsibility] [Values_ **Working in EGP strengthen individual proenvironmental behaviors**]

Box n. 4.9– Main home-work spillover effects identified from the analysis of the three aggregated data sources

Code family: SPILLOVER

Total amount of codes: 15

Total amount of quotations coded with at least one code belonging to that theme = 49

List of codes

[Attitudes_ **Good practice at work become a mental attitude**] [Attitudes_ No spill over about ink cartridge] [Attitudes_ No spill over about mobility to go to work] [Attitudes_ No spill over about waste separation at home] [Attitudes_ Reduction of paper consumption at home] [Attitudes_ Spill over doesn't rely on organization] [Attitudes_ The use of scooter to go to work] [Good practice_ Buying a low emission car] [Good practice_ The use of energy saving light bulbs at home] [Good practice_ Use of public transports to go to work] [Good practice_ Waste separation at home] [Values_ A number of strategies to save energy at home] [Values_ Saving water at home] [Values_ **Working in EGP sensitizes people awareness of environmental issues**] [Values_ **Working in EGP strengthen individual proenvironmental behaviors**]

4.6 Discussion

On the basis of the results presented so far, it is possible to identify some main trends that appear in line to the major theoretical issues that formed the basis for the main purposes and scope of the present WP2, and for the entire LOCAW project.

Following the general theoretical frame defined in the Deliverable 2.1, we will interpret and discuss the main results emerged with reference to the theoretical frame of the Situational analysis (Clarke, 2005; Clarke e Friese, 2007).

As already mentioned, situational Analysis is an updated version of Grounded Theory (Strauss & Corbin, 1990). This framework, emphasizes the role of the “social” dimension of the discursive material.

Such a social dimension is conceived, on the one hand, as a system linking the individual with the situations and places where perceptions, behaviours, and communication occur. On the other hand it can be conceived as an array of dimensions that define the situation under research as a complex system. Following this line of reasoning, the entire research process becomes a “situated interpretation” of discursive phenomena and interaction processes.

The fundamental assumption (at both the individual and collective level) of situational analysis is that, in some way(s), everything in a given situation at the same time constitutes and affects almost everything else in the situation: people and things, humans and nonhumans, fields of practice, attitudes, values, perceived norms, discourses, disciplinary and other formalized rules, symbols, controversies, organizations and institutions, can all be present and mutually influenced each other.

In the analysis process, a key stage consists then in the identification of a central core category, which connects other categories into a coherent and upper theoretical level of conceptualization. The main purpose of this stage is also to connect the theoretical model and dimensions to the implicit model emerging from the empirical data.

In the case under investigation, we can begin this theoretical inductive work starting from the central category that is most frequent (“grounded” to use the specific terminology of this theoretical model) and most dense in terms of the interpretative codes that can be identified through the analysis conducted using the ATLAS.ti software.

It is important to recall here that the *grounding* criterion refers to the number of quotations interpreted with a certain code, and *density* is a measure of the conceptual links between such a code and other codes into the same general data set (the so-called Hermeneutic Unit).

The picture presented in figure 4.7 represents a network view where the codes identified are linked each other to define the overall emerging theoretical model. For each code reported in the figure, the first number on the right of each label refers to the number of quotations, and the second number refers to the “density”.

As described above, the central code (“core category”) is a code embedded in the themes of values and sense of individual responsibility: “*Practices rely on individual feeling*”. It counts 13 quotations and it is in the right-side of figure 4.7. Other frequent codes (with 9 and 8 quotations), also characterized by a high density, represented in figure 4.7 refer to the themes of “*Attitudes*”, “*Rules*”, and “*Good practices*”.

Figure 4.7 also reports the main Code families (represented in the form of a node with the letters CF at the beginning) and – among these – the main dimensions of the situational analysis’. The Code families in the black background are the theoretical dimensions that emerged from interpretative analysis conducted so far.

As can be seen, all the themes are intersected each other by common theoretical dimensions. This is the case of *Driver at organizational collective level* and *Individual environmental responsibility* which are underlying to a number of codes.

Moving from the centre to the right-side of figure 4.7, it is worthy to highlight that the Code family “*Driver*” also includes a good practice code (*Waste separation*) which is, in turn, linked to an

organizational rule theme (*Active role in shaping individual behaviours*) and to a value theme (*Practice relying on individual*, which is as said, the most frequent or “grounded” code).

If one looks at the lower part of figure 4.7, it can be noted how the importance of individual factors is also confirmed by the fact that respondents often claim that perceived individual responsibility also relies on the opportunity to work in Enel Green Power, a company where people are *sensitized about environmental issues*

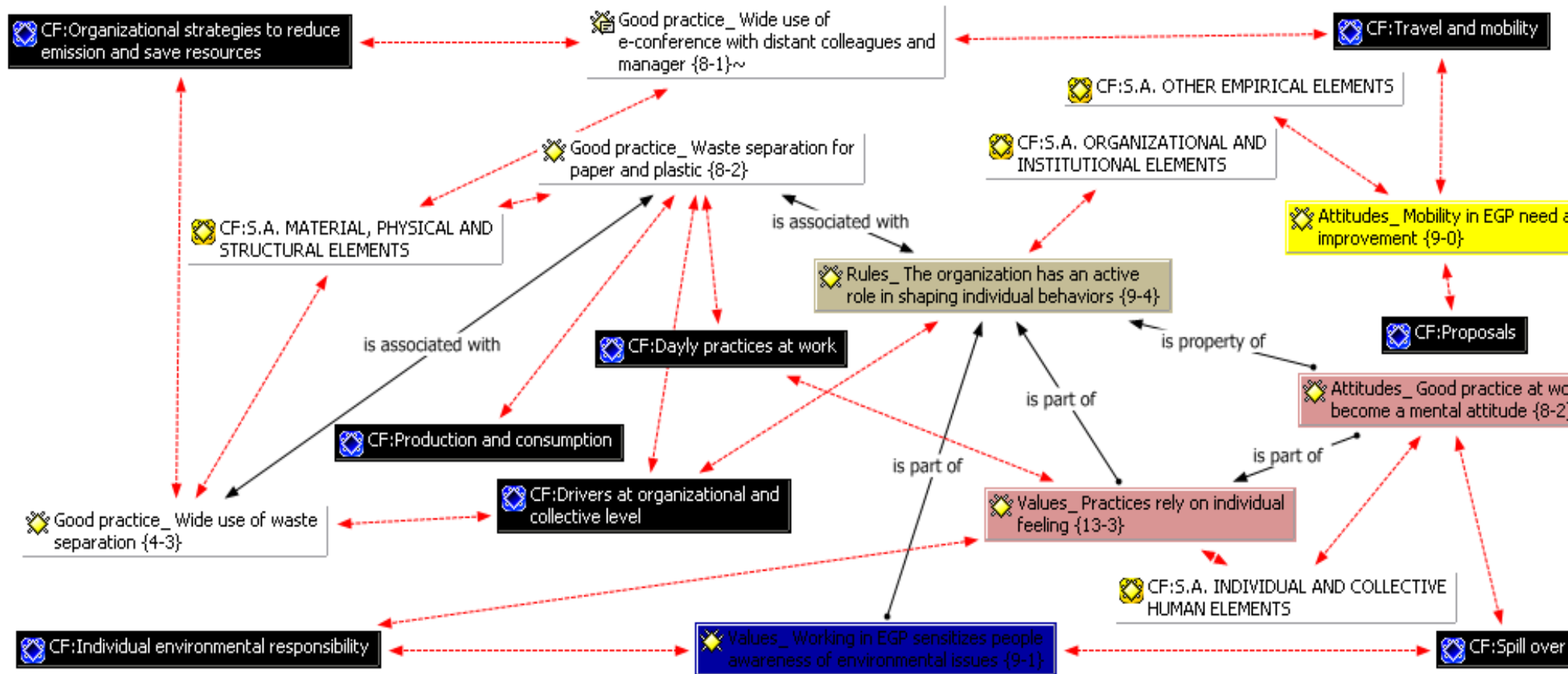
For what it concerns the original dimensions of the Situational analysis theoretical frame, it becomes evident that only some dimensions can be included into the represented map.

Firstly, we can infer the role of the dimension labelled as *Individual and collective human elements*, on the basis of various and consistent references to individual choices and responsibilities.

Secondly, we can identify the dimension of *Material, physical and structural elements* (placed in the left-side of the map). Among these, we can mention the availability of bins to separate waste, the technological devices necessary to communicate via e-conference with distant colleagues, the availability of incentives for sustainable mobility. This last emerges however also as a controversial matter.

Finally, the presence of *Organizational and institutional elements* can be noted, which can be conceived as linked to the above-mentioned active role in respect to the single individual positioning.

← all data seen



4.7 Conclusions and general overview of the results

In this final section, we provide a general overview of the results emerging in the aggregate data set or Hermeneutic Unit (see figure 4.8 as an example).

Figure 4.8: General overview of HU's components

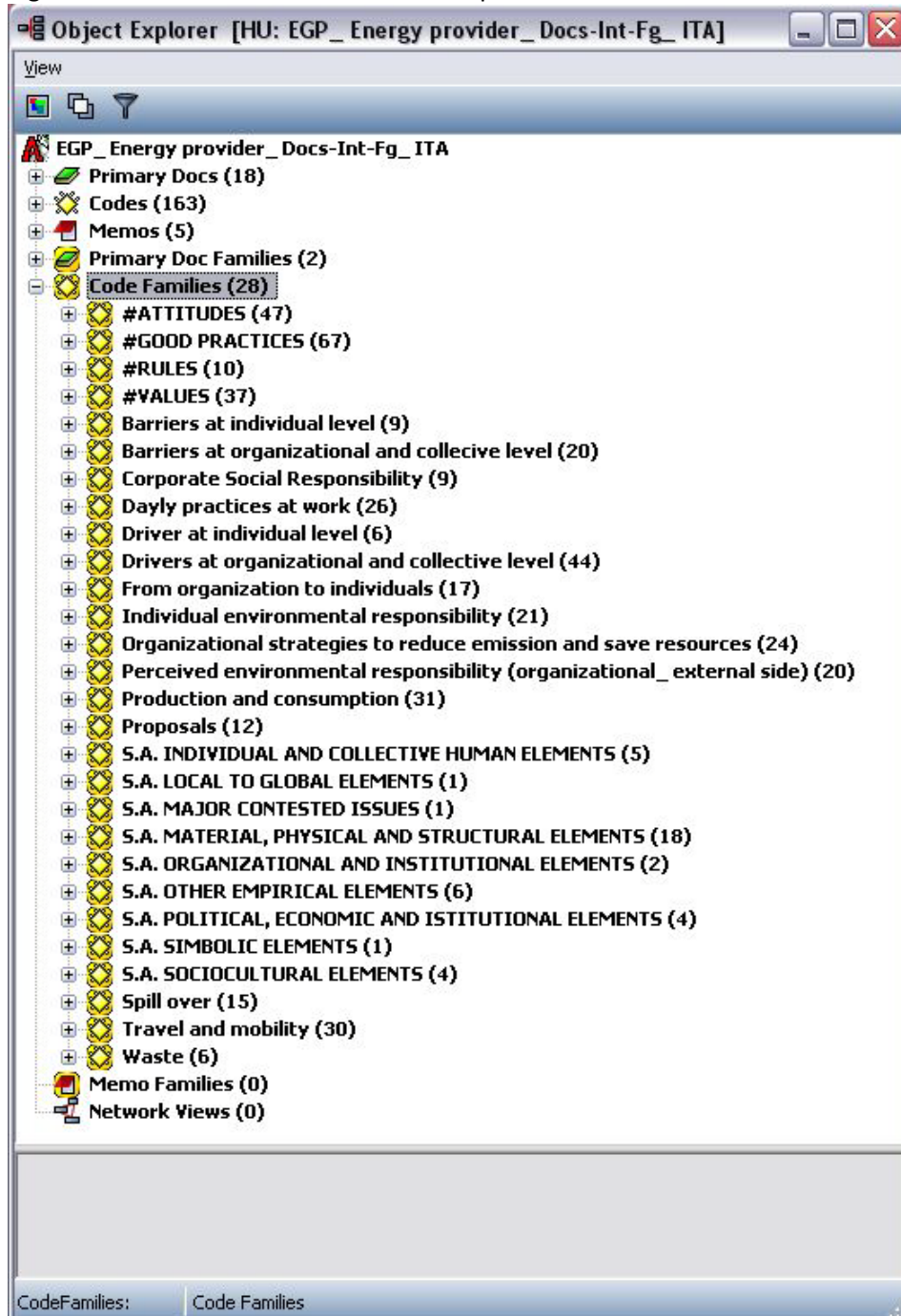


Figure 4.8 and 4.9 show the most frequent codes: the main column reports the codes ordered according to their frequency (that is how many quotations are coded with each code). To enhance the legibility, only the codes with at least 4 quotations were included in Figure 4.9.

An important aspect emerging from the overall analyses can be synthesized with the relevance assigned to the dimension of individual values: in addition to the organizational culture and constraints of EGP, which are in general strongly oriented towards the promotion of sustainable practices in the use and consumptions of energy and materials, many interviewers claims that pro-environmental *Practices rely on individual feeling* and initiatives.

For example, even if the organization provides a lot of bins, located in strategic places, it means that the decisions whether suing hem or not on an everyday basis stands on the single individuals.

The relevant number of quotations (13) assigned to this theme confirms the centrality of the individual level in order to explain the adoption of environmentally responsible actions.

Figure 4.9: Codes listed by a frequency criterion

Name	Grounded	Density
Values_Practices rely on individual feeling	13	2
Attitudes_Mobility in EGP need an improvement	9	0
Rules_ The organization has an active role in shaping individual behaviors~	9	1
Values_Working in EGP sensitizes people awareness of environmental issues	9	0
Attitudes_Good practice at work become a mental attitude	8	0
Good practice_Wide use of e-conference with distant colleagues and manager~	8	1
Good practice_Waste separation for paper and plastic	8	1
Values_Working in EGP strenghten individual proenvironmental behaviors	7	0
Good practice_Printing of documents only if necessary	7	0
Values_Organizational actions meet environmental sustainability when they match individual sensitivity	7	1
Attitudes_In ENEL there is a custom to save energy	6	0
Attitudes_Communication strategies for save energy could be improved	6	1
Good practice_Waste separation for spent ink cartridges and other toxic waste	6	1
Good practice_Car sharing/Car pooling to go to work~	6	1
Good practice_There is a tendency to decrease the use of printed paper	5	1
Good practice_Research in partnership with Italian and foreign outstanding institutions	5	1
Good practice_Control of switching off lights and computer at the end of work day	5	1
Good practice_The use of energy saving light bulbs at home	4	0
Values_ENEL has certificate for environmental responsibility	4	0
Attitudes_Troubles in mobility are due to the city	4	0
Values_ENEL promotes healthy life styles and it take care of safety	4	1
Good practice_Initiaves and incentives to reduce emissions~	4	0
Good practice_Diffusion of laptops to save energy	4	0
Good practice_Wide use of waste separation	4	3
Values_A number of strategies to save energy at home	4	0
Attitudes_Lack of information about the recycling die defeat individual efforts	4	0
Good practice_The organization should provide an "environmental education"~	4	0

163 Codes No item selected All Grounded - Number of refere

In a following position, it is important to underline the frequency of codes related to the theme of sustainable mobility (*Mobility in Enel Green Power needs an improvement*, 9 quotations). It is important to underline how mobility is one of the key issues in the entire LOCAW project, because of its centrality in the current environmental agenda.

A similar trend in the frequency of quotations can be found for what it concerns the general issue of organizational rules (*active role in shaping individual behaviour*, 9 quotations). This code, together with the following (*Working in EGP sensitize people awareness of environmental issues*, 9 quotations) enforce the idea that, despite the importance of the individual decision make level for the

performance of pro-environmental action, the culture and organizational mission (of EGP in this case) could play a crucial role to sensitize people to adopt practices and behaviours helping in the reduction of carbon emissions.

Finally, the issue of the so-called *good practice* experienced *at work* seems to emerge as an important theme as well (8 quotations in total): this aspect is linked to the importance of the social and environmental milieu for promoting the performance of resources saving actions, in order to push individual habits and behavioural routines towards the direction of sustainability.

5. THE NETHERLANDS

National report
University of Groningen

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5.1 Aims of the report

The aim of this report is to give insight in the sustainable practices of the municipality of Groningen. We will discuss the municipality's goals with regard to sustainability, the policies adopted to reach these goals and how effective the municipality is in reaching their goals. We will zoom in on the department "Information and Administration" and look at sustainability in the domains of transport, energy, waste and purchases. We used multiple sources for information collection, namely: official documents, internal reports, interviews and observations.

5.2 The municipality of Groningen and sustainability

The municipality of Groningen (in The Netherlands) is responsible for local governmental policies and administrative functions. It is divided into 10 departments, each of which has different tasks and responsibilities. In the realm of sustainability, the municipality is, among other things, responsible for implementation of local policies, waste collection, cleansing of the city and support of sustainable environmental projects.

Regarding sustainability, the municipality of Groningen has formulated a general goal: "We want Groningen to be and act as sustainable as possible" (Groningen progressive with Energy, Municipality Groningen, 2010, p. 1). This goal has been further specified in two main sub-goals:

- Make sustainability a key criterion in all purchase decisions.
- Reduce direct and indirect energy consumption and carbon emission.

These goals concern the municipality as an organization, but also the different facilities the municipality is responsible for, such as sport facilities, public transport, and traffic control systems, to name a few.

In the present study we will investigate how the municipality is trying to realize the main goals set. Which policies and approaches were adopted and how effective are they? To answer these questions we focused on the department (i.e. The Department of Information and Administration) and the domains (i.e. transportation, energy use, purchase decisions and waste management) for which these goals are most relevant.

5.2.1 Department of Information and Administration (DIA)

The department of "Information and Administration" (DIA) is responsible for procurement requirements. For example, DIA decides upon the conditions for organizational and departmental purchases, both for themselves, as well as for the other municipality departments. The absolute amount of money being spent on certain purchases depends on each department itself, but specific requirements that suppliers have to fulfill are determined by DIA. Also, they establish partly organizational policies such as company transport policies. Consequently, DIA is able to greatly influence how sustainable municipality purchases and policies are.

The DIA is located in two buildings. Workers in building 1 (located at Trompsingel) are mainly responsible for internal organizational affairs, like salary administration, legal matters of working conditions, procurement requirements for the whole organization as well as overseeing the financial position of the municipality, ICT- related working practices and the management of the capital portfolio of the municipality. Workers in building 2 (located at Kreupelstraat) are more directly involved with citizens affairs, by administering identity documents, citizen registrations, as well as handling taxes (like property taxes), and citizen complaints over municipal or tax procedures (Municipality Groningen, 2011).

In the following section we will discuss the specific goals and guidelines of the Municipality in four specific domains (transport, energy, waste, purchase). Furthermore, we will investigate how the guidelines are translated into practice by DIA and how effective the relevant policies are in promoting sustainability and environmental quality.

5.3 Analysis of the sustainability of the municipality

5.3.1 Method

To investigate sustainable practices and performances of the municipality of Groningen, we used objective data whenever possible, giving us an accurate and reliable picture of the state of affairs. We collected factual information on building characteristics, lighting systems, air-conditioning and heating from the building caretaker of the DIA. In addition, we received factual information from key persons responsible for various domains that have clear implications for sustainability, including waste generation, transport, energy use, purchase and material use. The domain-specific information was collected through document analyses and interviews with the building caretaker of the DIA and relevant key persons.

First, we analyzed the annual reports of 2009 and 2010 (Annual Report 2009; Highlights, Groningen most Sustainable City, 2011) to get a general overview of the sustainability policies that were implemented by the municipality. These annual reports comprise information about the policies, and effects of some of the sustainability policies. Next, we took a closer look at specific guidelines (contract specifications, product specifications and service specifications) set by the municipality to meet the sustainability criteria in the field of purchases (Tightening of the Procurement, 2008), to encourage the use of sustainable transport modes for commuting and work-related travel (Company Transportation Plan, 2009), and waste reduction and separation (Specifications and Conditions: Tender Cleaning Maintenance, 2006).

Finally, we investigated characteristics and installations of the buildings of the DIA department, such as the lighting system and air-conditioning, to get a picture of the energy efficiency and energy use in these buildings.

Please note that some practices and policies we discuss are implemented at an organizational level, some at a departmental level and some at a building level. This is due to the peculiarities of the DIA department, as DIA is responsible for general municipality purchase and partial policy establishing. For each domain we will discuss the practices at the relevant level. If possible, we discuss policies and practices at an organizational level, however if we need to have a closer look at one department or one office building, we will use DIA as a case in point.

5.3.2 Results

5.3.2.1 Travel-related practices

The municipality aims to reduce their CO₂ emissions related to transport, for both commuting and business travel. They try to realize this by encouraging employees to use sustainable modes of transport (bicycles, public transport and carpooling) and simultaneously discouraging the use of cars to come to work or for work-related travels (With own Strength, 2008).

Commuting related use of transport

To reduce the amount of commuter travel, the municipality is offering its employees the opportunity to work at home. Employees who work full time or 4 days a week can work 2 days at home (Company Transportation Plan, 2009; Home office, are you doing it?, 2011), except for ‘front-desk’ employees or employees who work with private data of citizens or employees. This policy’s effectiveness is

reflected an increase in the number of employees who make use of the opportunity to work at home and a decrease in commuter travel. In the year 2009 (Pilot study home office DIA, 2009), 33 (6.5%) employees used this opportunity and according to the personnel office this number increased to around 100 (22,8 %) in the year 2010.

To promote the use of more sustainable modes of transport for commuting employees, the municipality developed several policies aimed to make the use of bicycles, public transport or carpooling more attractive. The 'bicycle' policy, established by the government financially compensates employees for the purchase of a new bicycle. Employees are offered the opportunity to finance a bicycle with their pre-tax salary, which gives the employee an average discount of 40% on the price of the bicycle. The employees can make use of this arrangement if they use the new bicycle, totally or partly, to travel to work. The municipality will, in this case, buy the bicycle and offset the price, for example, with a monthly reduction of the pre-tax salary for a year (Company Transportation Plan, 2009). If the use of the financial compensation for the purchase of new bicycles increased or decreased in the last years has not been monitored. Furthermore, the municipality does not check if the bicycle is really used to commute and thereby if the guidelines of the policy are fulfilled.

The use of public transport is promoted by offering all employees a partial reimbursement of the costs of using of public transport. If employees hand in their public transport tickets they will get a refund of 10% of their expenses. To further encourage the use of public transport the municipality established flexible working hours, thereby making it easier for employees to adapt their working schedule to the timetable of public transport (Company Transportation Plan, 2009). In the year of 2010, 47 employees made use of the reimbursement scheme, which is 10.7 % of the employees of DIA.

Aside from encouraging employees to use more sustainable modes of transport, the municipality also tries to discourage the use of cars among its employees. The municipality established a parking policy for all municipality departments that need to use public parking spots in the payment area of the city. In essence, if the parking spot is in a payment area of the city, the company leases parking spots and only offers them free of charge to those who demonstrably need their car because of work-related needs (for example: ICT service) or medical reasons (e.g., handicapped employees). Furthermore, designated parking places are offered to those employees carpooling to work, and to those driving energy-efficient cars that emit substantially less CO₂. Employees who do not fall in one of these categories and who nonetheless use their car to get to work have to pay for the parking space themselves (Company Transport Plan, 2009).

The DIA department is located in the city centre. Both buildings (Kreupelstraat and Trompsingel) are located in the payment area of the city, making the use of a car expensive for employees who do not have access to free parking spaces provided by the Municipality. Furthermore, building 1 (Trompsingel) is located 900 m from the central train and bus station, thus being at close walking distance from public transport stations, and buses stop directly in front of the building. Building 2 (Kreupelstraat) is located 1.2 km from the central train and bus station, which is also easily accessible when walking or by bus. Also, the city of Groningen offers good and safe walking facilities (e.g., sidewalks, zebra crossings).

Are these policies effective? Table 5.1 shows that in the year of 2008, of the 505 people who were employed by DIA, 32 made use of reimbursement, this is 6.3%. In 2010, 439 people were employed and 47 made use of reimbursement, this is 10.7 %. This is an increase of 4.4 %. However, whether the bicycle use increased and car use decreased was not monitored.

Table 5.1: Reimbursement of public transport tickets from 2008 to 2010

Year	2008	2009	2010
Number of reimbursements	32	43	47
Total number of employees	505	527	439

Business-related travel

The municipality has similar ambitions when it comes to business-related travel as they do with regard to commuter-related travel. However, the municipality has more control over business travel as compared to commuting travel. Most importantly, the municipality introduced the policy that employees need to meet specific guidelines stating which mode of transport they are allowed to take for a business trip to get their travel expenses reimbursed.

The guidelines mandate that distances of 1½ -2 kilometer can be done on foot and that the use of a bike is appropriate for distances up to 7 ½ kilometers. For this purpose, employees have access to company bicycles. So no travel reimbursement are provided for trips shorter than 7 ½ kilometers. If the distance exceeds 7 ½ kilometers, employees are expected to travel this distance by using public transport. However, if the use of public transport would take more than 1 ½ times the time needed to travel by car, a company car can be used. If a car has to be used for a business trip it has to be leased from the municipality and if there are no company cars available a car has to be leased from a leasing firm that meets sustainability criteria. The use of a private car is the last option, but costs of car travel are only reimbursed when the relevant officer has given approval beforehand. According to the guidelines, travel costs are only refunded when the requirements are fulfilled completely (Company Transportation Plan, 2009). This means, for example, that if an employee uses the car for a trip that could easily be done by train, he or she would not get a refund for the travel costs.

Unfortunately, whether these guidelines really reduce the use of private and/or company cars and increase walking, cycling, and the use of public transport is not being monitored. Furthermore, according to employees, the refunding of travel costs related to car use is not strictly adhered to. If an employee can explain properly why it would be useful to travel by car instead of public transport to a particular destination, a refund is not denied. However, according to the building caretaker from DIA, the leasing of a car by the municipality for business-related travel occurs at the most once every 2 months, suggesting that the use of other transport options is more common.

Department cars

DIA owns a single company car with an energy label B, indicating that the car has relatively low gas consumption and low CO₂-emissions. Other cars used for work-related activities (such as ICT service) are leased by the municipality and the CO₂-emissions of these cars are not monitored.

5.3.2.2 Energy use

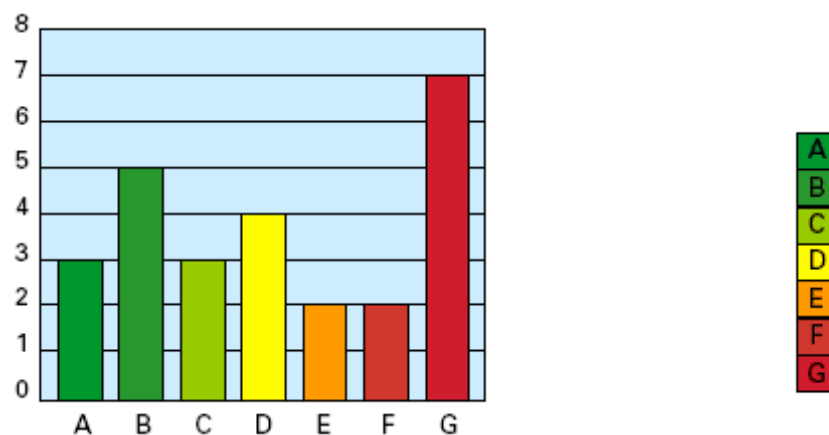
Regarding energy use (and efficiency), the municipality has the ambition to be CO₂ neutral by 2025. This means that by that time it aims to only use energy that is exclusively produced by renewable resources, such as sun, wind, and water. This goal is primarily set for the municipality as an organization and the facilities for which they are responsible. Furthermore, the municipality not only aims to use sustainable energy sources, but also to reduce its overall energy use (Master Plan Groningen Energy neutral, 2011).

To get an idea of the current energy efficiency performance of the office buildings, the municipality analyzed the energy use of all main municipality office buildings, public service buildings and all other

public buildings with a surface area above 1,000 m². This includes for example sport facilities or schools for which the municipality is responsible. Based on this analysis, so-called energy labels - which indicate the individual energy performance of the relevant buildings - were assigned to each building. The energy label is an energy certificate used in the Netherlands to meet the requirements of the European guideline “energy efficiency: energy performance of buildings” (EPBD 2002/91/EC). This guideline asks for transparency of the energy efficiency of a building. The energy label of a building is based on the so-called energy index, which is calculated on the basis of building characteristics (like: insulation, windows surface, floor material), building installations (like: heating systems and air conditioning) and usage patterns. The label can range from A to G, with A being the most energy efficient. The municipality hired an energy consulting service to carry out the analysis and to label each building under its management. Figure 5.1 shows which labels were assigned to the municipality buildings. There were a number of buildings with a low energy rating (A and B), but the most common rating was G (i.e. highly energy inefficient) (Annual Report 2009, 2009).

Figure 5.1. Energy labels of municipality buildings, ranging from A, highly energy efficient, to G, very low energy efficiency

Number of buildings



Energy labels

Interestingly, the energy efficiency of the two DIA buildings differs greatly. Building 1 (Kreupelstraat) is relatively energy efficient (energy label B) while the energy efficiency of building 2 is very low (Label G). Additional to the labels, for every building advices were given on how to realize energy saving, e.g., via simple behavior changes, which could reduce the energy use in the building in question. However, up to now after labeling the buildings and receiving the energy saving advice, no concrete actions were implemented to actually increase the energy efficiency of the relevant buildings, but plans have been developed to increase the energy efficiency of buildings, among which building 2 of DIA in the Kreupelstraat.

To get more insight into the energy use of the office buildings and facilities, the municipality installed an energy-information system called ‘E-sight’ (Annual Report, 2009). This system monitors the actual energy and gas use in a particular building every 15 minutes. By closely monitoring the energy use in different buildings, the municipality is able to detect unusual high consumption rates, e.g. at times where this should not be the case (e.g., outside office hours or during holidays), and can consequently fine-tune the system toward energy efficiency or develop interventions to prevent unnecessary energy use by the employees, among other things. Whether this data is used to implement actions to reduce overall energy use, however, depends on the building caretaker of every department. General guidelines to process and act upon the data are lacking, suggesting that the data is not used optimally to reduce overall energy use. In fact, the building caretaker of DIA merely uses the data to

reduce peak demand. Peak demand occurs when demand is very high at a given moment, for example when all employees would simultaneously turn on their computers. As the tariffs for energy use differ depending on the energy demand at a given time, peak demands result in increased cost for energy use. By spreading energy use over time peak demands can be avoided, resulting in lower costs. Avoiding peak demands will probably mainly reduce in lower energy costs and will not reduce the total amount of energy use. Table 5.2 shows that despite the ambitions of the municipality, overall energy use increased in both buildings over the recent years, while the number of employees decreased. It is not clear why energy use increased.

Table 5.2: Electricity use of building 1 and building 2 in the years 2006 to 2010

Year	Building 1 (kWh)	Building 2 (kWh)
2006	817,861	-
2007	985,714	-
2008	994,987	-
2009	1,039,207	891,326
2010	1,090,603	930,717

Office Installations and Equipment

The municipality has the ambition to reduce energy use. It therefore explicitly considers ways to reduce energy consumption in office buildings in building renovation plans. For example, building 1 of DIA has energy label B because during its renovation in 2004 energy efficient equipment was installed, such as central regulation of air-conditioning and heating systems. Moreover, building 2 will be renovated in the end of 2011, and the Municipality aims to improve the energy efficiency of the building from energy label G to label A. They will do so by, among other things, installing movement sensors for the lighting system (PvE Revitalization Building DIA, 2010).

Lighting system

The lighting system in both buildings of the DIA department is completely different although they both use similar energy-efficient lamps. In building 1 the lighting system is mostly activated by movement sensors. These movement sensors ensure that light is only used when an employee is present, which prevents light use when it is not needed. Furthermore, the sensors are daylight sensitive. This means that the artificial light is balanced with the daylight: the more daylight is in the room, the less artificial light is used. This implies that workers cannot operate the lighting system. This system guarantees that all the lights are turned off after office hours so that no unnecessary consumption takes place. The only places where this system is not used are the sanitary facilities, where, according to personal observation, lights are usually off when not in use. This implies that in building 1, technologies were implemented to reduce energy use of lighting.

In building 2 a lighting system is installed that allows the individual employee to turn the light on and off whenever needed. So, employees have full control over the lighting system, and total energy use for lighting fully depends on employees' behavior. Employees can decide themselves when to add artificial light to daylight and whether they turn off the light when leaving a room or the office. To prevent the unnecessary use of energy due to not switching off lights when leaving the building, the concierge has to check after office hours if all lights are turned off. However, during the day no one is responsible to keep an eye on this. In fact, observations of our research team suggest that 14% of the lighted rooms were not occupied which implies that lighting is used when there is no need to do so. Furthermore, 91% of the employees did use artificial lighting when at work. In the sanitary facilities, however, we observed that approximately 75% of the lighting was turned on even when no one was

using these facilities and according to the concierges about 8% of the lights were still on after office hours.

Air-conditioning and heating

The air-conditioning of building 1 and 2 are both centrally regulated, although the employees of building 1 can slightly adapt the temperature of their offices. In both buildings, the heating system is centrally regulated after office hours. However, the heating system operates differently used in both buildings. In both buildings, the heating systems are turned on around 6 o'clock in the morning, and set on the preset daytime temperature (ca. 18 C°), while heating temperatures automatically decrease after office hours. In building 1 the temperature can only be changed slightly by the employees, which prevents an excessive use of energy. However, in building 2 the heating system can be controlled individually by every employee; every employee can independently adapt the office temperature, which, according to personal observation, does not occur and so no excessive heating seems to take place.

Multimedia machines

The multimedia machines (computers, copy machines, faxes, scanners) used by the municipality automatically switch to a stand-by mode when not used for some minutes. However, the multimedia machines remain in this mode even outside office hours and during holidays, therefore still using energy. Even though these machines could be turned off, no one is explicitly responsible for it and, as a consequence, according to the concierge, no one is turning them off. However, computers and monitors of employees can be and are supposed to be turned off manually by the employees before they leave the office. Even though no one is responsible to check on this, the concierges informed us that they observed that around 2% of the employees do not turn off the monitors when they leave.

5.3.2.3 Waste handling

Waste Reduction

The production of (rest-) waste is associated with energy usage and CO₂-emissions when burned. The municipality (therefore) aims to produce as little waste as possible. To realize this goal, they try to decrease paper use among the employees and use porcelain boards and glasses in the canteen. For the purpose of reducing paper use, they digitalized forms for internal procedures and encouraged employees to use the online system as well as computerized procedures (like Pdf or email) to communicate and read documents. Furthermore, the multimedia machines of the municipality now use standard double-sided printing setting to reduce paper use.

Building 1 of the DIA introduced the guideline that every employee only has one meter in an office cupboard to store his or her documents. This policy aims to prevent the printing of documents. Through this guideline, and according to interviews with employees, the use of paper has been reduced. Furthermore, the employees of building 1 send all office-related communication via email. The only exception is the use of post for official contracts.

Building 2 shows a different picture. Given their task profile that involves working with citizens a lot, the use of paper is essential. For this reason communication via regular post is more common than communication via email. According to the building caretaker of DIA, this results in a higher paper consumption of building 2 than building 1.

According to observations made by the researcher, employees do make use of double-sided black/write printing. However, in building 1, one-sided colored printing is still common, suggesting that a standard setting of double-sided printing is not sufficient to encourage the employees to save paper.

No specific guidelines have been established regarding the reduction of battery use, chemical office waste or plastic. The canteen of DIA is using porcelain boards for self-made food and glasses for

drinks to avoid waste (Catering Municipality Groningen, 2009). However, the prefabricated food served is wrapped in plastic. Waste reduction practices are not systematically monitored, so it is not clear whether the policies that were implemented were effective in reducing waste.

Waste Separation

Separating waste enables recycling which reduces the amount of rest-waste produced. The municipality aims to separate waste as much as possible. Office workers are provided with different bins in their offices for paper and other waste. Also, the cleaning personnel collects rubbish from the two bins separately (Specifications and Conditions: Tender Cleaning Maintenance, 2006). According to observations by our research team, the waste separation system for paper and other kind of waste in the office of employees is effective. However, in central rooms such as copy rooms or the canteen, there is no separate waste system with two rubbish bins, and as a result, in such rooms waste is not separated.

In addition, every department collects used batteries and chemical office waste, which are also disposed of separately. The municipality monitored the disposal of batteries and chemical office waste from 2008 to 2010. In building 1 no batteries were disposed of in the years 2008 to 2010, while 26 kg of batteries were disposed of in building 2 during this period. Furthermore, Building 1 disposed 98 kg and building 2 61 kg of chemical office waste (printer ribbons, toner powder in cassettes, cartridges and correction fluid) during the years of 2008 to 2010.

Organic and plastic waste is, however, not disposed of separately. The food being offered in vending machines and coming from suppliers is mainly wrapped in plastic, which end up in regular waste bins.

5.3.2.4 Purchase of office supplies

The municipality has the ambition to make sustainable purchases as much as possible at both the organizational and departmental level. They had the goal to only purchase sustainable products (100%) by 2010. The municipality defines ‘100% sustainable purchase’ as purchasing products of suppliers that fulfill the criteria included in the guidelines of SenterNovem, an agency that gives advice in sustainability purchases of 52 product groups (see Table 5.3) (Sustainable purchase, 2010). For every product group, SenterNovem listed environmental and social criteria that have to be fulfilled for a product to be considered as sustainable. With regard to environmental aspects, the SenterNovem guidelines consider, for instance, the amount of energy needed for the production of the product, the waste production during the process and the use of recyclable material in the products. Regarding social aspects they consider, among others, human rights, fair trade and child labor (SenterNovem, 2011). Not all product groups listed in Table 5.3 are relevant for the municipality, while at the other hand not all relevant product groups are covered in these guidelines. The SenterNovem product groups, which are relevant for the municipality, cover only 10-15% of the whole purchase amount of the municipality. For the remaining product groups, no specific sustainability criteria have been defined, making it hard to decide whether purchases are 100% sustainable indeed.

The municipality aims to search the market for suppliers who offer the relevant product groups. By doing so they are especially considering suppliers who fulfill the SenterNovem criteria. After this initial search, a particular supplier is selected based on the costs of the relevant products. If the costs of the supplier fulfilling the SenterNovem criteria do not exceed the costs of a supplier who does not fulfill the criteria by more than 5 %, the municipality contracts the supplier who fulfils the SenterNovem criteria (Tightening of the Procurement, 2008). However, if the sustainable choice implies a 5% or more increase in costs, the municipality may still consider contracting the more sustainable supplier depending on the price and the product, but also may decide not to contract suppliers who provide the more sustainable product.

To give an indication of the sustainability criteria of SenterNovem included in contracts with suppliers, we had a closer look at the environmental criteria. For office supplies as well as printers and ink, the material has to be free of substances threatening human health and environmental quality. Cleaning supplies must not contain any hazardous or toxic substances and have to be used with a dosing cap to prevent excessive consumption. The paper has to be FSC paper. This means that the paper is produced through responsible forest management and that the forest resources are used with discernment. For company cars the municipality aims to purchase cars with energy efficiency labels A or B, which means that they are low on fuel consumption and CO₂ emissions. To make sure that the relevant sustainability criteria are fulfilled by delivery, the municipality checks samples of the orders.

The municipality purchased, among other things, 100% green electricity, organic catering, FSC paper and sustainable cleaning supply in 2008 (Annual Report 2009). In 2009, they purchased service cars with energy label A or B, company bikes and electric scooters and energy efficient computers (i.e., 2,500 small and energy-efficient models), to just name a few examples. Furthermore, in 2010 they purchased organic catering, sustainable office supplies (such as pencils and labels), FSC paper, printing services, sustainable computers and sustainable heavy motor vehicles, such as household waste collection vehicles (Monitor Sustainable Purchase 2010, 2011). So, purchases in these product groups fulfill the SenterNovem sustainability criteria. According to the municipality, of the products where sustainability criteria had been set by SenterNovem, the municipality purchased the sustainable option in 99% of the cases (Monitor Sustainable Purchase 2010, 2011). This does not mean that other products purchased are not sustainable at all. It only means that they did not completely fulfill all relevant sustainability criteria of SenterNovem or that they were purchased before 2008.

Table 5.3. The 52-product groups for which SenterNovem established sustainability criteria

Audiovisual equipment	Paper
Beverage vending machines	Postal services
Cables & Pipelines	Preservation works
Catering	Printing services
Catering equipment	Public Lighting
Cleaning services	Public Spaces Cleaning Services
Construction Works	Public Transport
Demolition of Buildings	Pumping Stations
Earthworks, Preparation of Building Sites & Remediation / Soil Decontamination	Renovation of Office Buildings
Electricity	Rental & Purchase of Office Buildings
External meeting and accommodation facilities	Reproduction Equipment
Green Spaces	Roads
Hardware	School transport
Heavy-duty Motor Vehicles	Security services
Hydraulic Engineering Constructions	Service Cars
International Business Travel	Sewerage Systems
Management & Maintenance of office Buildings	Special Purpose Passenger Transport
Mobile Equipment	Toner cartridges
Mobile Equipment Contracting	Traffic Control Systems
Moving Services	Transport Services
Networks / Infrastructure, Telephone Services & Equipment	Vehicle Maintenance Services
Office buildings to be newly built	Vessels
Office furniture	Water Purification & Sludge Treatment Plants
Office soft furnishing	Winter Maintenance
Office supplies	Work wear
Outdoor furniture	Work wear cleaning services

5.4 Conclusions

This report shows that the municipality established various policies to meet their sustainability goals. These policies focus on the reduction of commuter and business car use, paper use, energy use, waste handling and sustainable purchases. However, the effects of these policies are not always carefully evaluated, so it is not always clear to what extent these policies have been effective, and whether policies need to be adapted to meet the ambitions of the University.

6. GENERAL CONCLUDING REMARKS

Taken together, the data reported in this document seem to support the importance of the specific context and organizational culture in shaping the individual willingness and decision to engage in pro-environmental behaviours within the workplace.

However, the results emerging from the qualitative research conducted in each single country show also the existence of specific patterns that seem to characterize each national and organizational context that has been under investigation.

In Spain, for example, the data gathered at the University of La Coruna show a complex pattern of results, characterized by some general trends that the Spanish research team has highlighted as particularly worth noting. First, the participants highlight the importance of developing sustainable behaviours in each of the three main areas of interests focused in the LOCAW: energy consumption, waste generation and management, organizational mobility).

What seems important in this case, is that the behavioural and organizational changes reported by the participants are in line with the areas on which the Spanish government and mass-media have focused in their recent campaigns. On the one hand, this might indicate that some of these campaigns could indeed have been effective. St the same time, it could also indicate how the start-up of voluntary and individually-driven behavioural change in the direction of sustainability are not always easy to occur.

This could be an important aspect to be taken into account when considering the potential “spill-over” effects between home and work behavioural practices: on the practical side, for example, it could suggest the plausibility of transfer strategies that have worked in the household context also into the organizational context of the University, or vice-versa. Indeed, the Spanish participants declare a high level of spill over behaviour. However, notwithstanding their own feeling of personal responsibility, workers at University of La Coruna express a belief of not meeting specific strategies aimed at promoting sustainable practices in their workplace.

Both in the focus groups and in the interviews with key-informers, the general perception seems to be that the University does not attribute a particular importance to sustainable practices nor does it establish them as a strong priority. According to the interpretation given by the research team involved, this could also underline a deficient communication strategy in the University practices. Even if University members list their own personal values, attitudes, or awareness among the factors that lead them to engage in more sustainable behaviour at work, they still express the belief that the development and promotion of these attitudes or awareness should also be partly under the responsibility of the institution, who should be in charge of designing specific campaigns and initiatives meant to raise such awareness.

These results are in part consistent and in part contrasting with the main trends emerging from the research conducted in Italy. Here, the core category that emerged as more salient according to the qualitative data analyses performed with the Atlas.ti software refers to the concept expressed in the statement that “Practices rely on individual feeling”. This concept underlines the importance of the feeling of individual responsibility for the performance of sustainability-oriented practices, but seems at the same time to highlight the importance of the links between individual and organizational factors, which function through the “activation” of individual behaviours and values shared within the organizational milieu.

According to the analyses conducted so far by the Italian team, it seems that working in the Enel Green Power company might lead individuals to be more sensitized about environmental issues.

As for the research conducted by the Romanian team, the Aquatim members that participated to the study referred in particular a frequency of saving practices in the private area. The results show for

example that the majority of respondents did engage in specific measures aimed at reducing power, water or paper consumption at home.

Speaking very broadly, in each of the country involved, the drivers and barriers to behavioural practices that go into the direction of reducing carbon emission appear to be balanced each other. However, the organizational constraints are often perceived as overcoming the individual drivers.

In conclusion, we can affirm that a deep exploration of the individual factors relevant for engaging in pro-environmental behaviour in the workplace is needed in the future quantitative research steps that are scheduled in the LOCAW project activities.

The Spanish study highlighted for example the importance of the dimensions of individual self-efficacy and collective efficacy as main determinants for spill over behaviours. But the presence of strong self- and collective efficacy beliefs needs to be explored and ascertained in the other countries involved.

Likewise, the Italian study shows that personal factors such as personal responsibility and individual attitudes might have a strong influence in shaping implicit theories on sustainable daily practices in the workplace.

Therefore, the role of individual aspects should be explored more deeply in each country, and the connections between the individual and collective levels should be clarified through the future quantitative analysis.

According to a very simple scheme of interpreting the drivers/barriers dualism, it might appear that the drivers rely more on the individual while the barriers depend on the organization. An evidence of this result is reported in the conceptual themes concerning the sustainable practices at home. Along this direction, specific efforts of the future research phase should be dedicated to understand more deeply the role of the organizational factors influencing the willingness to engage in individual behaviour and the development and change of its underlying motivation.

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