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D3.2: Quantifying baseline consumption and pre-intervention behaviours – Year 2

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Executive Summary

Student Switch Off (SSO) is an inter-dormitory energy-saving competition run in 17 different university housing providers, housing 24,976 students in five countries over the academic years 2014/15 and 30,349 in 2015/16 respectively (55,325 students in total over two years). Through a series of engagement activities and instruments students are enabled, empowered and motivated to save energy in their dormitories as a result of change in their energy behaviour.

SAVES evaluation will assess the effectiveness of the Student Switch Off competition by monitoring both energy savings and human factors determining energy use. The approach and methods that will be used to conduct the impact assessment of the Student Switch Off competition rely on the approaches and methods described in the common ICT-PSP methodology for Impact Assessment.

This version of deliverable D3.2 presents an overview of the Student Switch Off evaluation methodology and the findings of the baseline questionnaire survey analysis for year 2 of the campaign. The main evaluation period for this report is academic year 2014-2015. The energy baseline remains unchanged and referring to the year before the campaign was launched in each university and is reported in D3.2 for year 1 (academic year 2013-2014).

FINDINGS OF THE BASELINE SURVEY

All students in participating dormitories were encouraged to complete an incentivized online baseline survey before their local energy-saving competitions were established, to help identify existing energy-saving attitudes, behaviours and habits. Questions were very similar to the questions in the year 1 survey. The improvements made to the survey involve a very small number of questions that were either found to be too long in length or did not give strong findings. In order to avoid respondent fatigue these questions were either reduced to the minimum necessary length (one question reduced in length) or were removed completely (one question removed). The findings of the baseline survey are summarized below:

Demographics

The number of female respondents was higher than the number of male respondents in Cyprus, Lithuania, Sweden and the UK. In Greece a good mix of male and female respondents was found.

The biggest majority of respondents was between 18-24 years of age in all countries. In Sweden and in Greece a large percentage of respondents (24% in each) was also between 25-29 years of age.

Significant differences in the level of studies of the respondents were observed across individual countries. In Cyprus and Greece a large number of respondents (>40%) were in year 3 or higher of their undergraduate studies. The biggest majority of respondents (92%) from Lithuania were undergraduates. In Sweden a good mix of undergraduates and post-graduates was observed while in the UK 65% of students were in their first year of studies. A number of respondents from Sweden and the UK were also exchange students (Erasmus or international).

Respondents studied all main subjects in all countries, but the percentage of respondents studying each subject varied significantly across countries. Only in Lithuania a large number of students studied architecture, engineering or technology (56% of respondents) and are assumed to have the highest level of awareness on energy saving issues. In Cyprus this number was rather low (12% of respondents). For the remaining countries the percentage was between 20%-32%.

Across individual countries significant differences were found in the origin of the students studying there. In the UK, but especially in Sweden, students came from many parts of the world. On the other hand, in Lithuania and Greece students were mostly native. In Cyprus students were either native or from other EU countries.

In the UK (95%), and to a smaller extent in Sweden (58%), respondents did not live in dorms of their current dormitory provider/university the previous academic year. In Cyprus, Greece and Lithuania the majority of respondents lived in the same dorms the previous academic year and are therefore very likely to have heard of or been involved in Student Switch Off.

Lifestyle
As far as lifestyle is concerned, a significant proportion of respondents from Cyprus (65%) tried to save energy in most things they did. In all other countries, a fair share of respondents tried to either do one or two things, do quite a few things or try to save energy in most things they did in their everyday life.

In addition, a good distribution of answers was found in Cyprus (30% lowest percentage -"I'd like to do a bit more"-, 35% highest percentage –"I'm happy with what I do now"-) to the question involving feelings about current lifestyle. In all other countries the most popular answer was "I'd like to do a bit more to save energy" selected by >40% of responses in each country.

Knowledge
In all countries and the control group the perceived level of information on what can be done at personal level to save energy was noticeably higher than the level of information on what was actually consumed.

Overall, respondents felt badly informed about their own energy consumption. On what can be done at personal level to save energy the overall level of information was closer to neutral. The highest level of information on own energy consumption was found in Cyprus and the lowest in Greece. The highest level of information on what can be done to save energy in dormitories was again found in Cyprus and the lowest in Greece and Lithuania.

The energy saving action that the majority of respondents were aware of was that of switching off lights in empty rooms. Boiling the kettle only with the necessary amount of water was the least recognized action in Greece. Putting a lid on pans when cooking was the least recognized action in Cyprus, Sweden, the UK. Boiling the kettle with only the necessary amount of water and putting a lid on pans when cooking were both the least recognized energy saving actions in Lithuania.

Habits and Practices
Switching off lights was the action performed most frequently in all countries. This action had high habit strength in Cyprus, Lithuania, Sweden and the UK as it was applied more than often.

Putting a lid on pans when cooking was the least applied energy saving action in Cyprus and the UK. In Greece boiling the right amount of water in the kettle was the action applied the least. In Sweden, avoiding leaving equipment on stand-by and putting a lid on pans were the actions followed least often while in Lithuania the action followed the least often was that of putting an extra layer on before turning on the heating.

Behavioural Antecedents
Seven variables of behaviour change theory and models capable of inducing behaviour change from the Norm Activation Model (NAM), the Theory of planned behaviour (TPB) and the Triandis' Theory of Interpersonal Behaviour (TIB) were studied (see Appendix C).

Statistically significant differences were found between countries in all variables of behaviour change theory and models namely: personal norms, ascription of responsibility, awareness of consequences, attitudes, perceived behavioural control, emotions and role beliefs. However, overall results indicate views and attitudes that were favourable to energy saving.

Opportunities for Energy Saving
The most important reasons for being more energy conscious were: "it is a habit students adopted from home", "it saves energy", "it is the right thing to do", and "it helps reduce global warming". The least important reasons were those associated with other peoples' opinion, namely fitting in with other residents of the dormitory, other peoples' approval and someone else asking but also that of earning money or prizes out of it.

The most important reasons for being less energy conscious were: lack of feedback on how much is consumed, the fact that energy saved in the halls won't save students any money, that they have other things on their mind, and limitations of the building's structure and its systems. The least important reasons for being less energy conscious were sustainable living not being for them, fear of being made fun of and lack of inspiration from the university/college to act in an energy saving manner. The ranking of the more and the less important reasons for being less energy conscious varied across countries. A large number of respondents also felt that nothing prevents them from being energy conscious.

Comparison with control group
Between the treatment and the control group many similarities existed making the two samples (treatment and control group) comparable and therefore benefiting the analysis to be performed at the

end of the year. Significant similarities were found in all of: lifestyle, knowledge, habits and practices, behavioral antecedents and incentives and barriers for energy saving.

Statistically significant differences were only found in the demographics of the two samples (gender, age, nationality, level of education and subject of study).

1. Introduction

Student Switch Off (SSO) is an inter-dormitory energy-saving competition run in 17 different university housing providers, housing 24,976 students in five countries over the academic years 2014/15 and 30,349 in 2015/16 respectively (55,325 students in total over two years).

Through a series of engagement activities and instruments students are enabled, empowered and motivated to save energy in their dormitories as a result of change in their energy behaviour.
The project encourages any action that can help save energy with specific attention given to six energy conservation actions:

- Switch off lights
- Switch off appliances
- Don't overfill the kettle
- Put a lid on the pan when cooking
- Put on more layers, not the heating
- Try ventilation through open windows before using a cooling device.

This deliverable (D3.2) sits within Work Package 3 and has been developed according to the requirements and services that have been defined and developed in previous work packages (see Figure 1).

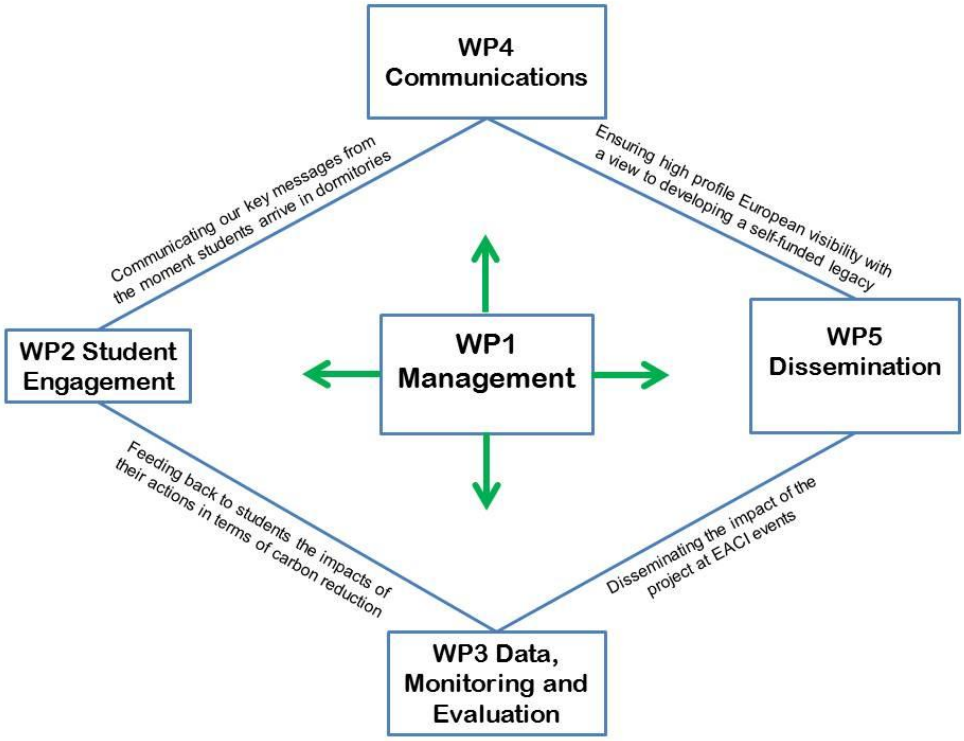

Figure 1: Overview of the SAVES project

The evaluation methodology is based on the common ICT-PSP methodology for impact assessment[1] and aims to provide proof for the achievement of some of the project's most important objectives:

[1] The Common ICT-PSP Methodology for Impact Assessment, Version 4. The ICE-WISH project

- 8% average reduction of electricity usage, compared to baseline year, across participating dormitories
- 4.23GWh electricity-savings (1,902tCO2e / 363toe) achieved, compared to baseline year, across participating dormitories, over both academic years
- Quantifiable behaviour change delivered in students, with 10% swings on target behaviours (e.g. students switching off the lights when not in use) between surveys.
- 90% of students state they have carried forward the energy-saving habits learnt in the project into private accommodation once they have left dormitories
- 2.85GWh estimated energy savings (998tCO2e/year / 245 toe) from students carrying forward their energy-saving habits into private accommodation.

D3.2 presents an overview of the Student Switch Off evaluation methodology and the findings of the energy baseline and baseline questionnaire survey analysis. Two reports quantifying the baseline consumption and pre-intervention behaviours will be delivered, one for each academic year. The report delivered in Year 1 of the campaign (academic year 2014-2015) contains detailed results of both baseline consumption and pre-intervention behaviours. In this second report the pre-intervention behaviours for academic year 2015-2016 are analytically presented. The energy baseline remains unchanged and referring to the year before the campaign was launched in each university. Based on lessons learned from Year 1, the methodology for the establishment of pre-intervention behaviours has been updated where necessary (see section 2.2.5).

2. Impact Assessment Methodology

While technical efficiency improvement in energy use remains a key way of curbing greenhouse gas (GHG) emissions, there is concern about whether this approach is, on its own, sufficient to counteract the growing impact of human actions. Work to investigate this has found that energy efficiency improvement measures can have mixed effects unless they are also accompanied by adjustments in human behaviours[2]. As a result, the SAVES evaluation will assess the effectiveness of the Student Switch Off competition by both monitoring energy savings and human factors determining energy use, as this "may increase our understanding of the success or failure of intervention programs" [3].

This section details the approach and methods that will be used to conduct the impact assessment of the Student Switch Off competition. These rely on the approaches and methods described in the common ICT-PSP methodology for impact assessment[1].

2.1 Evaluation methodology overview

The effectiveness of the Student Switch Off competition will be evaluated through the level of achieved:

a) Energy savings
b) Behaviour swings

These will be estimated with the help of the following means:

1. *Baseline energy use*

Consumption data collected at each dormitory in the baseline period will be used to establish consumption models. Baseline energy data are pre-intervention consumption data. These may be utility bill data or metered data.

2. *Monitored energy use*

All dormitory providers are required to monitor their energy consumption. Many have automated meter-reading (AMR) systems in place whilst others are still manually reading meters. To that end, for the purposes of this baseline manual data has been gathered.

[2] L Adua, 'To Cool a Sweltering Earth: Does Energy Efficiency Improvement Offset the Climate Impacts of Lifestyle?', *Energy Policy*, 38 (2010), 5719–5732
[3] W Abrahamse and others, 'A Review of Intervention Studies Aimed at Household Energy Conservation', *Journal of Environmental Psychology*, 25 (2005), 273–291 (p. 283)

3. *Baseline questionnaire survey*

All students in participating dormitories will be encouraged to complete an incentivized online baseline survey before their local energy-saving competitions are established, so we can identify existing energy-saving attitudes, behaviours and habits (September 2014; September 2015).

4. *Follow-up questionnaire survey*

All students that completed the baseline survey will be encouraged to complete a follow-up survey close to the end of the academic year (May 2015; May 2016). Pre- and post-competition surveys will be analysed to identify attitudinal, behavioural and habitual changes relating to energy conservation that could be attributable to the project.

In year 2, questionnaire surveys will also be conducted with students who lived in participating dormitories in 2014/15 and moved into private accommodation to identify whether the energy-saving actions established during their time in dormitories have been carried forward.

2.2 Study Methodology

2.2.1 Objectives

The evaluation methodology will provide proof of the achievement of the following project targets:

- 8% average reduction of electricity usage, compared to baseline year, across participating dormitories
- 4.23GWh electricity-savings (1,902CO2e / 363toe) achieved, compared to baseline year, across participating dormitories, over both academic years
- Quantifiable behaviour change delivered in students, with 10% swings on target behaviours (e.g. students switching off the lights when not in use) between surveys.
- 90% of students state they have carried forward the energy-saving habits learnt in the project into private accommodation once they have left dormitories
- 2.85GWh estimated energy savings (998tCO2e/year / 245 toe) from students carrying forward their energy-saving habits into private accommodation

2.2.2 The sampling frame

The sampling frame for the calculation of energy savings consists of dormitory buildings used as university student accommodation in five different European countries: Cyprus, Greece, Lithuania, Sweden and the UK. Where possible, control buildings (control group) will also be considered for each of the participating countries.

The sampling frame for questionnaire survey consists of students living in student accommodation in five different European countries: Cyprus, Greece, Lithuania, Sweden and the UK. Where possible, a control group will also be considered for each of the participating countries.

2.2.3 Study Design

The most suitable design approach for behaviour based efficiency projects is the Randomized Controlled Trial (RCT) approach where participants are randomly allocated to treatment and control groups. The RCT approach is not feasible in this project; therefore, depending on the availability of a control group, the following two approaches will be used to determine the impacts of the competition:

a) the pre-post energy use method
b) the matched control group method.

A. Pre-Post Energy Use Method

In this approach, the energy use of participating buildings is compared to their historical energy use (pre-competition energy use). Pre- post-comparison will also be performed for all of the identified independent variables measured through the questionnaire survey meaning that each building is its own non-random control group.

A simple pre-post comparison without weather and occupancy adjustments is not recommended, and will be used only where baseline energy data are not available.

B. Matched Control Group Method

Controls will not be selected by random sampling, but rather by matched sampling. The idea is to choose control dormitory buildings which are as similar as possible to treatment dormitory buildings in ways that could affect energy use and energy related behaviours of the residents. As a result, groups should be similar in, as much as possible, the following ways:

- Resident characteristics:
  - Demographics. Demographic profiles should be similar.
  - Studies. Group should be taking similar courses/subjects to those of the treatment group as these affect their energy-related knowledge and skills.
- Green initiatives:
  - Past green initiatives. Both groups should either have or not have been involved in energy saving initiatives during the baseline period.
  - Future green initiatives. The control group should not receive any energy saving intervention (building renovation or information campaign on energy saving etc) for the entire duration of the SSO competition (monitoring period).

For each control dormitory building the following energy consumption data should be available:

- Historical electricity consumption data for academic year 2013/2014, preferably monthly (or even shorter interval) data.
- Electricity consumption data for academic year 2014/2015, at same or shorter time intervals as for the historical consumption data.

Residents of the control group dormitory buildings must also take part in the pre- and post-competition questionnaire surveys.

2.2.4 Data Collection

2.2.4.1 Data Requirements

For both approaches data requirements are the same. Where the matched control group method is followed data should also be provided for the control group in order to help determine changes attributed to the service, and whether the treatment and control group are comparable in their observable traits. For each of the dormitory buildings (treatment and control group) the following data are required:

1. Monthly total electricity use data (kWh):
   a) For the baseline period (at least twelve months prior to the establishment of the competition). These may be utility bill data or metered data.
   b) For the monitoring period (monthly, or shorter interval data, for the period that the competition took place in the dormitory). These should be monitored data. Where meters have not yet been installed, but also for the case of the control group, data may come from utility bill data.
2. Degree Days for the time period considered for the energy data (i.e. weekly, monthly, bimonthly)
3. Occupancy data. Energy use and savings will be presented as kWh/resident.
4. Questionnaire survey data
   a) Demographics
   b) Energy related lifestyle and information levels
   c) Socio- Psychological
   d) Habits.

2.2.4.2 Instruments and procedures

Energy information sheet

An energy information sheet template is provided to help collect energy consumption, degree day and occupancy data for the baseline and monitoring period (see Appendix D). The template also allows for the inclusion of notes related to major infrastructure change that may affect electricity usage. This information is collected by the dormitory managers.

The questionnaire survey

The questionnaire survey contains questions covering the following topics, and is common for both the baseline and follow-up survey:

- Demographics. To determine the basic demographic characteristics of the sample namely: age, gender, nationality, subject of studies and level of studies.
- Energy related lifestyle and information levels. To determine the (self-reported) existing energy related knowledge but also the current energy related lifestyle and intention to change it.
- Psychological, Social and Behavioural aspects. To identify drivers of pro-environmental behaviours.
- Habits. To identify behaviour patterns and opportunities for promoting energy efficiency.
- Opportunities for energy saving. To identify incentives and barriers for energy saving.

A copy of the questionnaire is found in Appendix A.

The questionnaire survey was translated in all participating country languages (English, Greek, Lithuanian and Swedish). An online version was created for each of the translated versions with the help of SurveyMonkey software[4].

The link to the online survey was circulated to students via email. The baseline survey was circulated at the beginning of the academic year and before the launch of the competition (pre-intervention), while the follow-up survey will be performed closer to the end of the competition and end of the academic year (post-intervention).

The target response rate for the baseline survey is 15%, while a 15% response rate of the baseline survey responses is targeted for the follow-up survey. In order to ensure engagement, a €100 1st cash prize, and 3 x €25 were offered as project wide incentives, while country specific incentives were also provided (i.e. additional cash draw or chocolate).

2.2.5 Study Variables

Energy use and energy savings may well be driven by demographic variables, socio-psychological variables, such as attitudes, values and norms, habits, knowledge but also opportunities or barriers of structural or other nature.

The variables considered for the evaluation of the Student Switch Off campaign are explained below.

2.2.5.1 Dependent variables

Energy use
For the baseline period total electricity use will be calculated based on billing or metered data.

Energy Savings
Energy savings will be estimated at the end of the academic year using the pre-post or the matched control group approach for the duration of the competition in each dormitory.

2.2.5.2 Independent variables

The variables presented below are the study variables considered in year 2 of the campaign and address students living in dormitories. Changes in variables had impact only on two questions of the survey (one removed entirely, one shortened). A description of these variables is found in Appendix B.

Demographics
Demographical factors are considered to have an impact on energy use and energy savings. The variables most relevant for this project are considered to be the following:

- Age
- Gender
- Nationality
- Subject of studies
- Level of studies
- Living in dorms status

Lifestyle

[4] www.surveymonkey.com

Residents of dormitories are very likely to have a much different lifestyle in relation to energy consumption than if they were living in private accommodation in which they would have to pay for their own bills based on what they consume. Two items measure current energy related lifestyle.

- *Current lifestyle and energy saving*

The item was measured on a six-point scale 1 'I don't really do anything to save energy' to 5 'I try to save energy in everything I do' and 6 'Don't know'.

- *Feelings about current lifestyle and energy saving*

The item was measured on a four-point scale 1 'I'd like to do a lot more to save energy' to 3 'I'm happy with what I do at the moment' and 4 'Don't know'.

Knowledge
Knowledge of energy saving issues was measured through two types of questions as a means of measuring awareness on energy saving issues:

- *Familiarity with energy saving actions*

A list of actions was provided, asking respondents to select those that are energy saving actions. All actions in the list were energy saving actions.

- *Level of information*

Two items were used to measure the level of (perceived) information with energy saving issues: information about possibilities to save energy in dormitories and information about own consumption in the dormitories. Responses were given on a five-point scale, with scores ranging from 1 'Very badly informed' to 5 'very well informed'. Lower scores show lower levels of information on own energy consumption.

Socio – psychological variables
Variables capable of inducing behaviour change from the Norm Activation Model[5] (NAM), the Theory of planned behaviour[6] (TPB) and the Triandis' Theory of Interpersonal Behavior [7] (TIB) have been selected (see Appendix C). Responses are given on a five-point scale with scores ranging from 1 'Strongly disagree' to 5 'Strongly disagree'. Namely, items from the following variables are studied:

- *Personal norm (PN)*

Norms defined as the perceived social pressure to perform or not to perform the behaviour in question. Personal norm was measured with the item "I feel morally obliged to save energy".

- *Ascription of Responsibility (AR)*

Ascription of responsibility reflects the feelings of responsibility for the negative consequences of not engaging with the behaviour in question.
Ascription of responsibility was measured with the item "Everyone including myself is responsible for climate change".

- *Awareness of consequences (AC)*

Awareness of consequences reflects the extent to which an individual is aware of the negative consequences from not engaging with the behaviour in question.
Awareness of Consequences was measured with the item "Energy conservation contributes to a reduction of the climate change impacts".

- *Attitudes (ATT)*

Attitude refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behaviour in question.
Attitude toward energy saving was measured with the item "Saving energy means I have to live less comfortably".

[5] S.H. Schwartz. *Normative influences on altruism*. In L. Berkowitz (Ed.), Advances in experimental social psychology, Vol. 10 Academic Press, New York (1977), pp. 221–279
[6] Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179-211.
[7] H. Triandis, Interpersonal Behavior, Brooks/Cole Pub. Co, 1977.

- *Perceived Behavioural Control (PBC)*

Perceived behavioural control refers to the perceived ease or difficulty of performing a behaviour and is assumed to reflect past experience as well as anticipated impediments and obstacles.
Perceived behavioural control was measured through the item "I feel in complete control over how much I use".

- *Emotions (EMO)*

Emotional reactions towards a given behaviour are considered capable of changing that behaviour.
Emotions were measured through the item "Doing things to save energy makes me happy".

- *Role beliefs (ROL)*

Roles are 'sets of behaviours that are considered appropriate for persons holding particular positions in a group'[8].
Role beliefs were measured through the item "As a resident of the dorms I should be more concerned about my energy use during my stay there".

Habits
A habit is a routine of behaviour that is undertaken at "low levels of consciousness" (i.e. switching off lights in unoccupied rooms). The frequency that each of the six target behaviours is undertaken was measured on a five-point scale with scores ranging from 1 'Never' to 5 'Always'. The higher the score the greater the habit strength.

Opportunities for energy saving
Situational constraints and conditions but also social and affective factors influence behaviours and intentions to save energy. Incentives and barriers for energy saving wee measured through the following questions:

- Incentives

A list of possible reasons for being more energy conscious was provided. The three most important reasons were be selected. This helped identify possible incentives that support energy efficient behaviour and therefore where the project activities should emphasise on.

- Barriers

A list of possible reasons for being less energy conscious was provided. The three most important reasons were be selected. This helped identify the barriers for energy saving and therefore where effort should be put by the project for removing them.

2.2.7 Data analysis

Analysis of energy data
This task is about the development of a methodology for setting baseline consumption and the calculation of energy savings. A methodology was developed based on the International Measurement and Verification Protocol (IPMVP) and the "eeMeasure" methodology (http://eemeasure.smartspaces.eu) developed for the EC ICT Policy Support Programme (ICT-PSP). This includes a methodology for the establishment of a baseline at each dormitory and a common approach for calculating and reporting savings.

Consumption data collected at each dormitory in the baseline period will be used to establish consumption models. These models will provide a basis for comparison over the project period to quantify energy savings. Baseline reports were provided at the beginning of the campaign (see D3.2 from Year 1) and are followed by savings reports at the end of each academic year the campaign is implemented.

The proposed methodology includes the following elements:

[8] Triandis, H., 1977. Interpersonal behaviour. Monterey, CA: Brookds/Cole.

- kWh electricity consumption data collected from the 2013/14 academic year for each dormitory to form their baseline
- All partners have been asked to record this data from September 2013 and most have data pre-dating this time
- For participating UK Universities already hosting the Student Switch Off campaign, the pre-intervention data already collected will form the baseline (pre-2013)
- The electricity consumption data for each dormitory during the academic years 2014/15 and 2015/16 will be compared against the baseline data from that dormitory – so they are competing to beat their own baseline usage
- Initially the comparisons will be updated on a month-by-month basis for most dormitories as that is how frequently the meters are read
- The smart meter element of the project, which will be developed during year 1 of the project, will allow the energy savings to be viewed on an online dashboard
- The dormitories will compete on the basis of which can reduce their electricity consumption by the greatest percentage compared to their own baseline
- The energy dashboard will be able to show a leaderboard of how the dormitories from across all five countries are performing and rank them in terms of their percentage reduction
- When we start running the project it's possible that the proposed methodology may provide an advantage to certain dormitories in which case it will be revisited and amended as necessary

Analysis of questionnaire data
Descriptive statistics are used to describe the basic attributes of the sample at project level and at country level.

Chi-square test is used to determine any significant differences between countries and between the treatment and control group.

3. Questionnaire analysis and results

3.1 Survey response rate

The baseline student survey was circulated in all countries participating in the project. In addition to the dormitories where SSO is implemented, the survey was also circulated in a control group, in Linköping, Sweden.

A total of 5,404 students responded to the baseline questionnaire survey. However, nearly 500 of the respondents gave a negative answer to the question "Do you currently live or will be living in halls of residence this academic year?" and were thus excluded from the analysis. Another 220 students only answered the questions on demographics and did not give any answer to the questions with environmental content. These respondents were also excluded from this analysis.

A total of 4,684 valid responses were collected (Table 1) corresponding to an overall 14.3% response rate.

Table 1 Survey response rate

	Cyprus	Greece	Lithuania	Sweden	UK	Sweden CG	Total
Students participating in SAVES (count)	208	1,142	7,171	3,171	18,181	2406	**32752**
Valid responses (count)	43	55	752	821	2392	621	**4684**
Response rate (%)	21%	5%	10%	26%	13%	26%	**14%**

Respondents live in dormitories in five different countries (Table 2). Respondents from seventeen dormitory providers took the survey. Seven of these are in the UK, five in Lithuania, three in Sweden, two in Greece, one in Cyprus. From the three Swedish dormitory providers, two are implementing the Student Switch Off campaign while one housing provider participates as provider of the control group.

Table 2 Universities and dormitory providers participating in the survey

Country	Dormitory provider
Cyprus	University of Cyprus
Greece	University of Athens
	Technical University of Crete
Lithuania	Vilniaus Gedimino technikos universitetas
	Vilniaus universitetas
	Klaipedos valstybine kolegija
	Vilniaus technologiju ir dizaino kolegija
	Vilniaus kooperacijos kolegija
Sweden	SSSB in Stockholm
	SGS Studentbostäder in Göteborg
Sweden, Control Group	Studentbostäder in Linköping
UK	University of Bath
	Cranfield University
	De Montfort University
	The University of Northampton
	Queen Mary, University of London
	University of Warwick*
	University of Worcester

*replaces University of West England from last year

3.2 Results: Dormitories implementing the competition

3.2.1 Respondent characteristics

Overall, a higher number of female respondents (50% female compared to 37% male) answered the questionnaire. Eleven percent did not answer the question whilst one percent preferred not to say. Significant differences in gender exists across countries ($\chi^2(16)=97.687$, $p<.001$). The number of female respondents was higher than the number of male respondents in Cyprus, Lithuania, Sweden and the UK. In Greece a good mix of male and female respondents was found. The largest percentage of female respondents was found in Cyprus (70% female) while the largest percentage of male respondents was found in Sweden and in Greece (around 40% in each).

Significant differences in the age of respondents were also found across countries ($\chi^2(24)= 819.612$, $p<.001$). The biggest majority of respondents was between 18-24 years of age. In Sweden and in Greece a large percentage of respondents (24% in each) was also between 25-29 years of age. Eleven percent of total respondents did not answer the question on age.

Half of total respondents were native to the country they studied in. Across individual countries significant differences were found in the origin of the students studying there ($\chi^2(12)=809.708$, $p<.001$). In the UK, but especially in Sweden, students came from many parts of the world. On the other hand, in Lithuania and Greece (with a small two percent exception) students were only native. In Cyprus students were either native or from other EU countries. Eleven percent of total number of respondents did not answer the question on citizenship.

Table 3 Respondent demographics

	Cyprus	Greece	Lithuania	Sweden	UK		Total
Gender							
Male	23%	40%	38%	42%	36%		**37%**
Female	70%	38%	45%	48%	53%		**50%**
Other	0%	0%	0%	0%	0%		**0%**
Prefer not to say	2%	2%	0%	3%	1%		**1%**
skipped question	5%	20%	17%	7%	11%		**11%**
Age							
<17	0%	0%	0%	0%	1%		**1%**
18-20	40%	20%	48%	14%	58%		**47%**
21-24	44%	31%	33%	48%	22%		**30%**
25-29	7%	24%	2%	24%	6%		**9%**
>=30	2%	4%	0%	5%	2%		**2%**
prefer not to say	2%	2%	0%	1%	0%		**1%**
skipped question	5%	20%	17%	7%	11%		**11%**
Citizenship							
Native	74%	78%	82%	28%	47%		**50%**
EU citizen	19%	2%	0%	36%	17%		**17%**
non-EU citizen	2%	0%	0%	29%	26%		**21%**
skipped question	5%	20%	17%	7%	11%		**11%**
Year of study							
1st Year University	19%	11%	36%	6%	65%		**47%**
2nd Year University	21%	9%	24%	15%	2%		**9%**
>2nd Year University	40%	49%	32%	31%	6%		**17%**
PGr - Masters	16%	24%	7%	36%	21%		**21%**
PGr - Doctorate	5%	7%	1%	8%	2%		**3%**
Other	0%	0%	0%	4%	4%		**3%**
skipped question	0%	0%	0%	0%	0%		**0%**
Subject of studies							
Architecture / Engineering / Technology	12%	25%	56%	32%	20%		**29%**
Arts / Humanities	14%	9%	5%	10%	24%		**17%**
Health Sciences / Medicine	0%	7%	3%	17%	12%		**11%**
Mathematics / Physical Sciences	23%	31%	12%	10%	13%		**13%**
Social Sciences	51%	27%	24%	31%	32%		**30%**
skipped question	0%	0%	0%	0%	0%		**0%**
Living in dorms status							
First year in specific dorm providers dorms	30%	22%	38%	58%	95%		**75%**
Lived in specific dorm providers dorms in the previous academic year	70%	78%	62%	42%	5%		**25%**
skipped question	0%	0%	0%	0%	0%		**0%**

Overall, a good mix of students from different years and levels of education was found. All respondents answered the question. The majority of respondents were in their first year in university (47%) followed by students doing their masters (21%). Three percent of respondents selected the "other" option. These students were mainly exchange students (Erasmus or international) and studied in either Sweden or the UK. Significant differences in the level of studies of the respondents were observed across individual countries ($\chi^2(20)=1584.501$, $p<.001$). In Cyprus and Greece the largest percentage of students in third year or higher of their undergraduate studies is found (40% and 47%, respectively). The biggest majority of respondents (92%) from Lithuania were undergraduates. In Sweden a good mix between undergraduates and post-graduates was observed (52% and 48%, respectively). Sixty-five percent of students in the UK were in their first year of studies and another 21% were doing their masters.

Respondents studied all main subjects of study, but subjects studied across countries varied significantly ($\chi^2(16)=537.165$, $p<.001$). Overall, an equal percentage of respondents (~30%) studied architecture, engineering, technology or social sciences. Arts and Humanities were studied by 17% of the total sample while the least represented subjects of study were those of health sciences and medicine and of mathematics and physical sciences (11% and 13% of respondents, respectively). In Lithuania a large number of students (56% of respondents) studied architecture, engineering or technology and were assumed to have the highest level of energy awareness. In Cyprus this number was rather low (12% of respondents). For the remaining countries the percentage was between 20%-32%.

Three quarters of total respondents did not live in dorms of their current dormitory provider/university the previous academic year. At country level this is mostly the case for the UK (95%) and Sweden to a smaller extent (58%). In Cyprus, Greece and Lithuania the majority of respondents lived in the same dorms the previous academic year (70%, 78% and 62%, respectively) and were therefore very likely to have heard of or been involved with Student Switch Off.

3.2.2 Lifestyle

Respondents were asked to rate their current and future lifestyles in relation to energy saving. Two questions were asked in this context.

3.2.2.1 Energy saving efforts in current lifestyle

Respondents were first asked to select the statement that best describes their current lifestyle in relation to energy saving.

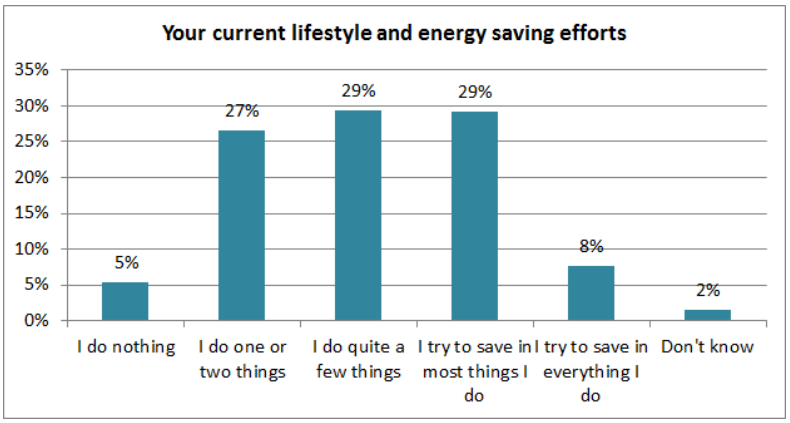

Figure 2 Energy saving efforts in current lifestyle (total sample)

Only 8% of all respondents thought that they tried to save energy in everything they do while another 5% that they did nothing to save energy. Twenty-seven percent claimed to do one or two things in their everyday life to save energy while 29% claimed to do quite a few things or try to save energy in most things they do.

In individual countries the number of respondents that did nothing to save energy varied between 0% (for Cyprus) and 13% (for Greece). The percentage of respondents that tried to save energy in most things or everything they do varied between 34% (UK) and 74% (Cyprus) across countries. The increased energy saving efforts documented for Cyprus could be because the respondents were involved in Student Switch Off the year before (low resident change rates every year). On the other hand, the biggest percentage of respondents that did one or two or quite a few things to save energy was found in the UK (60%) and the lowest in Cyprus (26%).

Table 4 Energy saving efforts in current lifestyle (per country)

	Your current lifestyle					
	I don't really do anything to save energy	I do one or two things to save energy	I do quite a few things to save energy	I try to save energy in most things I do	I try to save energy in everything I do	Don't know
Cyprus	0%	9%	16%	65%	9%	0%
Greece	13%	22%	27%	27%	9%	2%
Lithuania	5%	22%	29%	29%	14%	1%
Sweden	7%	25%	28%	32%	7%	1%
UK	5%	29%	31%	28%	6%	2%

3.2.2.2 Opinion about energy saving efforts in current lifestyle

The second question asked respondents to select the statement that best describes their feelings about their current lifestyle in relation to energy saving.
The largest number of respondents (46% of total) would like to do a bit more to save energy in their current lifestyle. Twenty-six percent would like to do a lot more, and another 26% were happy with what they did now.

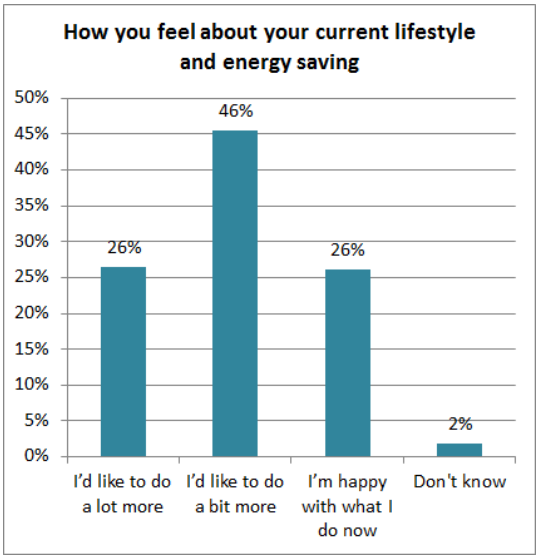

Figure 3 Opinion about energy saving efforts in current lifestyle (total sample)

At country level the percentage of respondents that were happy with what they did at the moment varied between 23% (Lithuania) and 35% (Cyprus). The percentage of respondents that would like to do a bit more varied between 30% (for Cyprus) and 47% (for Sweden and the UK) across countries, while the number of those who would like to do a lot more varied between 22% (for Sweden) and 34% (for Lithuania).

Table 5 Opinion about energy saving efforts in current lifestyle (per country)

	How do you feel about your current lifestyle and energy saving?			
	I'd like to do a lot more to save energy	I'd like to do a bit more to save energy	I'm happy with what I do at the moment	Don't know
Cyprus	33%	30%	35%	2%
Greece	24%	44%	29%	4%
Lithuania	34%	41%	23%	1%

Sweden	22%	47%	29%	2%
UK	26%	47%	26%	2%

3.2.3 Knowledge

3.2.3.1 (Perceived) level of information

Respondents were asked to rate how well informed they feel about a) their own energy consumption and b) the possibilities to save energy in their dormitories on a 1 to 5 scale (1= Very badly informed, 5 = Very well informed).

Significant differences existed across countries in both areas ($\chi^2(16)=311.935$, $p<.001$ for a) and ($\chi^2(16)=350.912$, $p<.001$ for b)). Nonetheless, in all countries the perceived level of information on what can be done at personal level to save energy was noticeably higher than the level of information on what was actually consumed in all countries.

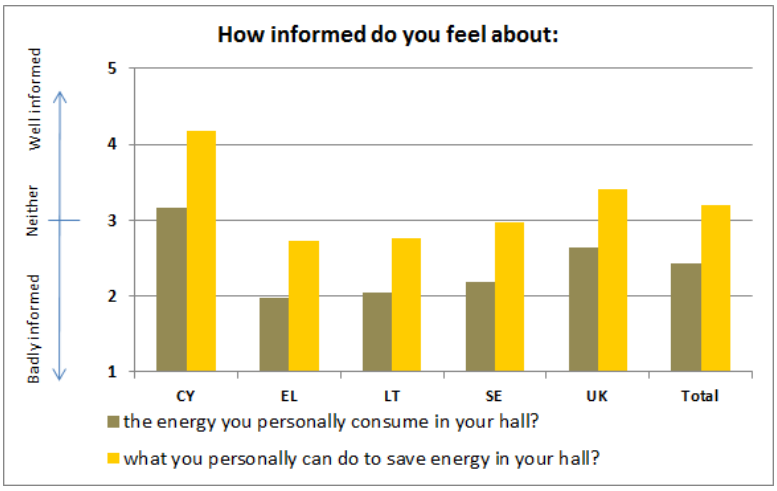

Figure 4 Mean values for perceived level of information on a) personal energy use and b) ways to save energy (total sample and per country)

Overall, respondents to the survey felt badly informed about their own energy consumption (overall mean value of 2.43). The highest level of information on own energy consumption wais found in Cyprus (mean value of 3.16) and the lowest in Greece (mean value of 1.98).

On what can be done at personal level to save energy the overall level of information was closer to neutral (overall mean value of 3.19). The highest level of information on what can be done to save energy in dormitories was again found in Cyprus (mean value of 4.19) and the lowest in Greece and Lithuania (mean values of 2.74 and 2.76, respectively).

Table 6 Mean values and standard deviations for perceived level of information on a) personal energy use and b) ways to save energy (total sample and per country)

	How informed do you feel about:											
	Cyprus		**Greece**		**Lithuania**		**Sweden**		**UK**		**Total**	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
a. the energy you personally consume in your hall?	3.16	.949	1.98	1.248	2.04	1.071	2.18	1.133	2.63	1.055	2.43	1.109
b. what you personally can do to save energy in your hall?	4.19	.732	2.74	1.179	2.76	1.079	2.97	1.098	3.40	.992	3.19	1.070

3.2.3.2 Awareness of energy saving actions

Students were asked to identify energy saving actions through a list of actions targeted by Student Switch Off. All of the actions provided were actual energy saving actions. The energy saving action that the majority of respondents were aware of (98% of total) was that of switching off lights in empty rooms. The action that students were least aware of (67% of total), and was therefore an energy saving opportunity, was that of putting a lid on pans when cooking.

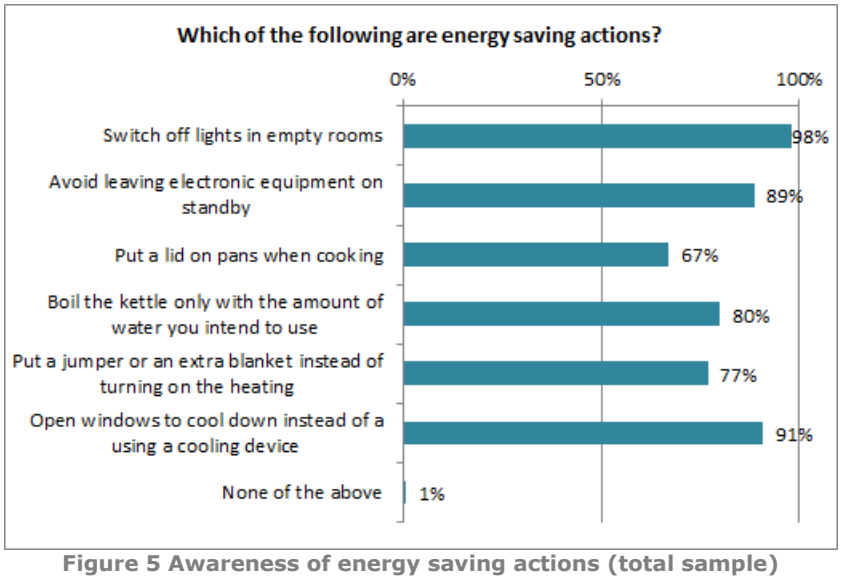

Figure 5 Awareness of energy saving actions (total sample)

Switching off lights was the most recognized energy saving action in all countries. The least recognized energy saving actions, and therefore actions to target for energy saving, were: boiling the kettle only with the necessary amount of water in Greece and in Lithuania, putting a lid on pans when cooking in Cyprus, Sweden, the UK and in Lithuania (same percentage as for "boiling only the right amount of water").

Table 7 Awareness of energy saving actions (per country)

Energy saving action	Cyprus	Greece	Lithuania	Sweden	UK
Switch off lights in empty rooms	96%	74%	99%	97%	99%
Avoid leaving electronic equipment on standby	91%	74%	86%	87%	90%
Put a lid on pans when cooking	64%	67%	61%	66%	69%
Boil the kettle only with the amount of water you intend to use	80%	58%	80%	76%	82%
Put a jumper or an extra blanket instead of turning on the heating	69%	67%	61%	73%	83%
Open windows to cool down instead of a using a cooling device	82%	74%	89%	86%	94%
None of the above	0%	19%	0%	1%	0%

3.2.4 Habits and practices

Respondents were asked to give the frequency in which they perform each of the six targeted energy saving behaviours on a 1 to 5 scale (1= Never, 5 = Always).

Statistically significant differences were found in the frequency that all six targeted behaviours were performed across countries ($p<.001$). Overall, the energy saving actions performed most frequently were those of switching off lights (mean value of 4.52) and opening windows for cooling (mean value of 4.50). The action performed least often was that of putting a lid on pans when cooking (mean value of

3.51). This is in fact in line with the awareness of students about the various energy saving actions summarized in Figure 5.

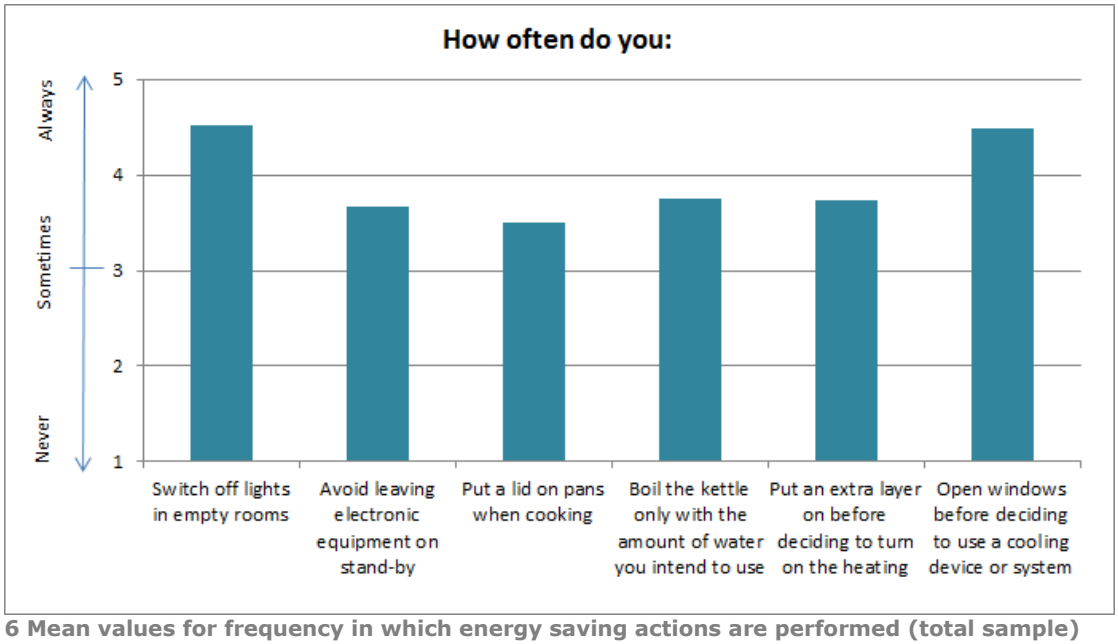

Figure 6 Mean values for frequency in which energy saving actions are performed (total sample)

At country level, switching off lights was the action performed most frequently in all countries. This action had high habit strength in Cyprus, Lithuania, Sweden and the UK as it was applied more than often (mean value > 4.00) and is therefore an action with low energy saving potential.

High energy saving potential exists for the least performed energy saving actions. Putting a lid on pans when cooking was the least applied energy saving action in Cyprus and the UK (mean values of 3.69 and 3.31, respectively). In Greece boiling the right amount of water in the kettle was the action applied less frequently (mean value of 2.89). In Sweden, avoiding leaving equipment on stand-by and putting a lid on pans were the actions followed least often (mean value of 3.58 and 3.59, respectively) while in Lithuania the action followed the least often was that of putting an extra layer on before turning on the heating (mean value of 3.54).

Table 8 Mean values and standard deviations for the frequency in which energy saving actions are performed (per country)

Country		Switch off lights in empty rooms	Avoid leaving electronic equipment on stand-by	Put a lid on pans when cooking	Boil the kettle only with the amount of water you intend to use	Put an extra layer on before deciding to turn on the heating	Open windows before deciding to use a cooling device or system
Cyprus	**M**	4.71	4.05	3.69	3.90	3.69	3.81
	SD	.457	.764	.950	.932	1.047	1.131
Greece	**M**	3.49	3.07	3.16	2.89	3.33	3.47
	SD	1.375	1.116	1.348	1.301	1.187	1.307
Lithuania	**M**	4.52	3.76	4.09	3.91	3.54	4.71
	SD	.774	1.023	1.007	.994	1.237	.638
Sweden	**M**	4.53	3.58	3.59	3.81	3.72	4.51
	SD	.689	1.109	1.181	1.136	1.195	.878
UK	**M**	4.54	3.69	3.31	3.70	3.82	4.46
	SD	.663	1.035	1.171	1.117	1.099	.849

3.2.5 Behavioural antecedents

Overall, seven items from seven variables of behaviour change theory and models were measured with the survey. Items were evaluated on a five-point Likert Scale (1= Strongly disagree, 5 = Strongly Agree) with higher values indicating a higher level of agreement with the statement.

Overall results indicate views and attitudes that are favourable to energy saving. The lowest agreement, at entire project level, was found with the attitude item "Saving energy means I have to live less comfortably" (mean value of 2.42). Low value for the attitude item indicates a more positive attitude towards energy saving. The highest agreement, at entire project level, was found with the ascription of responsibility item "Everyone including myself is responsible for climate change" and with the awareness of consequences item "Energy conservation contributes to a reduction of the climate change impacts" (mean values of 4.28 and 4.24, respectively). High mean values for the two items indicate a high level of ascription of responsibility but also a high level of awareness of the impacts of energy consumption on the environment.

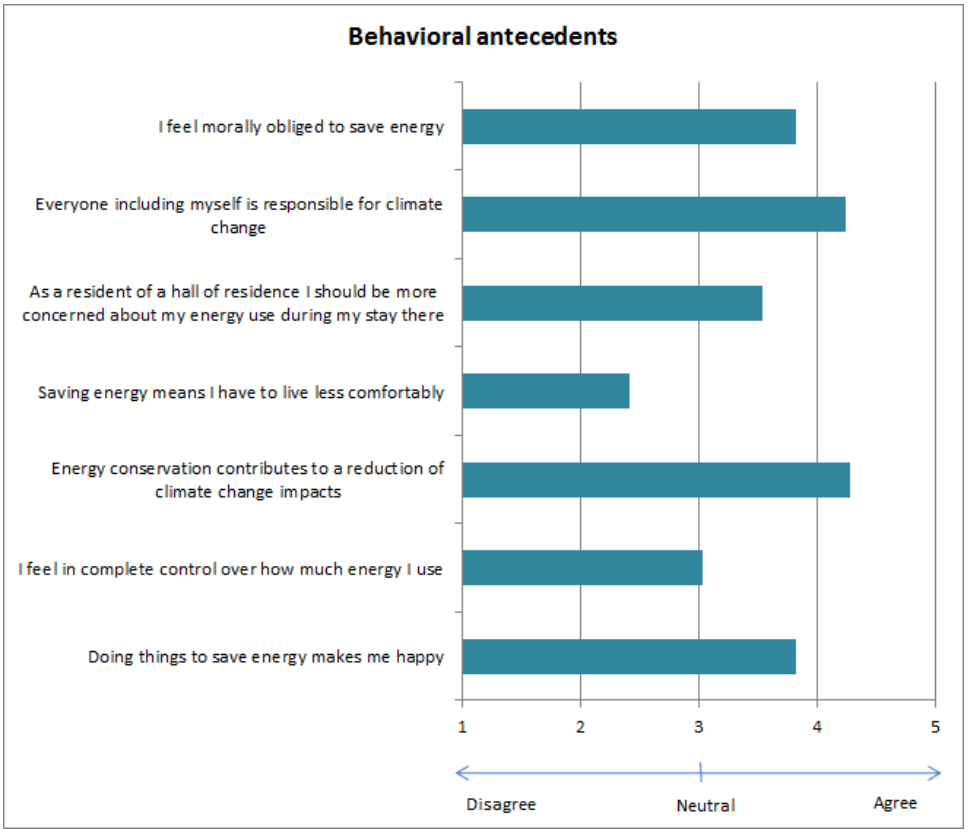

Figure 7 Mean values for behavioural antecedents (total sample)

Personal norms

The differences in personal norms across countries were significant ($\chi^2(16)=114.441$, $p<.001$).
The feeling of moral obligation to save energy is rather strong in Cyprus, Lithuania, Sweden and the UK (mean values range between 3.80 (in Lithuania) and 4.30 (in Cyprus). In Greece the feeling of moral obligation to save energy is closer to neutral (mean value of 3.02).

Table 9 Mean values and standard deviations for personal norms (total sample and per country)

	Cyprus		Greece		Lithuania		Sweden		UK		Total	
Personal norms	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**

I feel morally obliged to save energy	4.30	.71	3.02	1.34	3.80	.94	3.91	.97	3.81	.91	3.82	.94

Ascription of responsibility

Differences in ascription of responsibility were significant across countries ($\chi^2(16)=178.147$, $p<.001$) Respondents in all countries seemed to agree more rather than disagree that they were responsible for climate change. Mean values across countries ranged between 3.11 (in Greece) and 4.38 (in Lithuania).

Table 10 Mean values and standard deviations for ascription of responsibility (total sample and per country)

	Cyprus		Greece		Lithuania		Sweden		UK		Total	
Ascription of responsibility	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Everyone including myself is responsible for climate change	4.28	.70	3.11	1.35	4.38	.79	4.34	.89	4.19	.87	4.24	.88

Awareness of consequences

Differences in awareness of consequences were significant across countries ($\chi^2(16)=125.478$, $p<.001$). Awareness of the consequences that energy consumption had on the climate was rather high in all countries as mean values ranged between 3.60 (in Greece) and 4.44 (in Cyprus).

Table 11 Mean values and standard deviations for awareness of consequences (total sample and per country)

	Cyprus		Greece		Lithuania		Sweden		UK		Total	
Awareness of consequences	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Energy conservation contributes to a reduction of the climate change impacts	4.44	.67	3.60	1.37	4.40	.78	4.36	.82	4.23	.81	4.28	.82

Attitudes

The differences across countries in attitudes were significant across countries ($\chi^2(16)=124.304$, $p<.001$). In Cyprus, Lithuania, Sweden and the UK respondents tended to disagree rather than agree with the statement that saving energy means that they have to live less comfortably. In Greece respondents tended to agree more with the statement.

Table 12 Mean values and standard deviations for attitudes (total sample and per country)

	Cyprus		Greece		Lithuania		Sweden		UK		Total	
Attitude	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Saving energy means I have to live less comfortably	2.21	.77	3.18	1.35	2.28	.97	2.46	.99	2.44	.97	2.42	.99

Perceived behavioural control

The differences in perceived behavioural control across countries were significant ($\chi^2(16)=97.430$, $p<.001$).

The perception of control over how much energy was used was stronger in Cyprus and closer to neutral in Greece, Lithuania, Sweden and the UK.

Table 13 Mean values and standard deviations for perceived behavioural control (total sample and per country)

	Cyprus	Greece	Lithuania	Sweden	UK	Total

Perceived behavioural control	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
I feel in complete control over how much energy I use	3.53	.83	3.04	1.19	3.13	.96	2.83	.97	3.07	.95	3.03	.96

Emotions

Differences in emotions across countries were significant ($\chi^2(16)=57.753$, $p<.001$).
Overall, saving energy seemed to have some impact on emotions in all the countries as mean values ranged between 3.60 (in Greece) and 4.23 (in Cyprus).

Table 14 Mean values and standard deviations for emotion (total sample and per country)

	Cyprus		Greece		Lithuania		Sweden		UK		Total	
Emotions	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Doing things to save energy makes me happy	4.23	.61	3.60	1.27	3.85	.79	3.85	.85	3.80	.81	3.82	.82

Role beliefs

Differences in role beliefs were found to be significant across countries ($\chi^2(16)=61.347$, $p<.001$).
Respondents tended to agree more rather than disagree with the perception that as residents of the dormitories they should be more concerned about their energy consumption. Mean values across countries ranged between 3.2 (in Greece) and 3.98 (in Cyprus).

Table 15 Mean values and standard deviations for role beliefs (total sample and per country)

	Cyprus		Greece		Lithuania		Sweden		UK		Total	
Role beliefs	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
As a resident of the dorms I should be more concerned about my energy use during my stay there	3.98	.89	3.20	1.24	3.66	.92	3.44	.96	3.54	.90	3.54	.93

3.2.6 Opportunities for energy saving

3.2.6.1 Incentives

Respondents were asked to select the three most important reasons for being more energy conscious from a list provided to them. The most important reason for being more energy conscious was because it was a habit students adopted from home (77% of total). Other important reasons were because it saves energy (63% of total), it is the right thing to do (48% of total) and it helps reduce global warming (41% of total).

The least important reasons seemed to be those associated with other peoples' opinion such as fitting in with other residents of the dormitory (1% of total), other peoples' approval (2% of total) and someone else asking (3% of total) but also that of earning money or prizes as an outcome (2% of total).

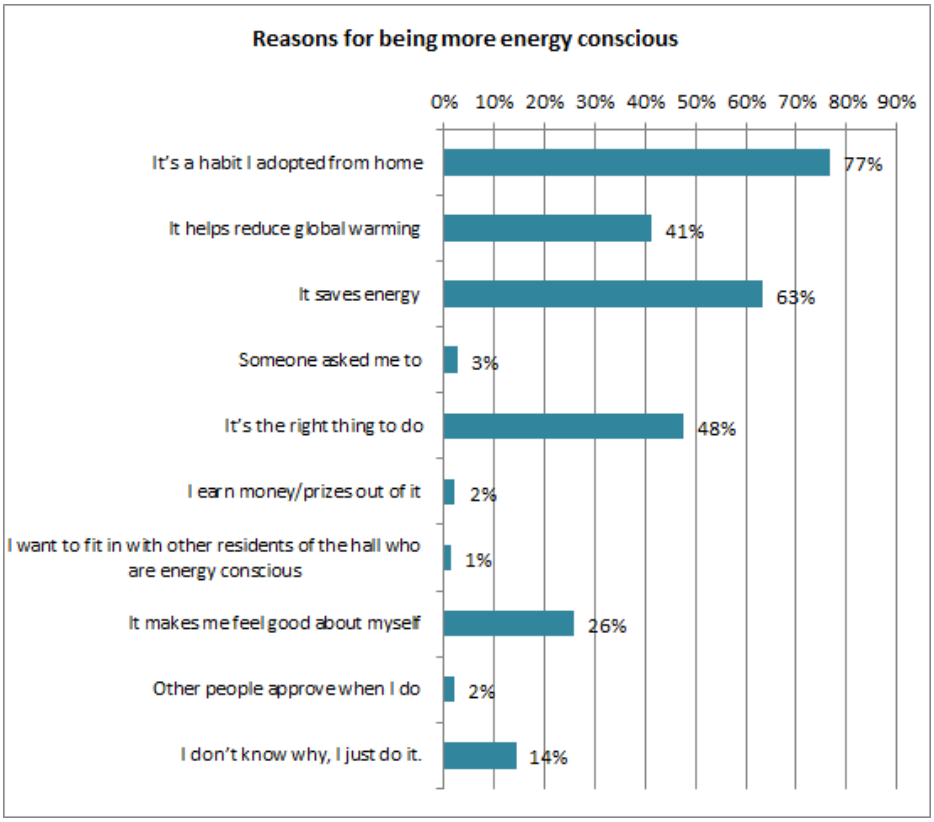

Figure 8 Reasons for being more energy conscious (total sample)

In Lithuania, Sweden and the UK, the three most important reasons were the same as those found at project level ("it's a habit I adopted from home", "it saves energy" and "it's the right thing to do"). In Greece and Cyprus the reason "it's the right thing to do" gives its place to "it makes me feel good about myself".

The least important reasons were common for all countries and were those associated with other peoples' opinion such as fitting in with other residents of the dormitory, other peoples' approval and someone else asking but also that of earning money or prizes out of it.

Table 16 Reasons for being more energy conscious (per country)

Reason for being more energy conscious	**Cyprus**	**Greece**	**Lithuania**	**Sweden**	**UK**
It's a habit I adopted from home	64%	66%	85%	75%	75%
It helps reduce global warming	36%	29%	34%	43%	43%
It saves energy	60%	49%	65%	62%	64%
Someone asked me to	0%	0%	2%	2%	3%
It's the right thing to do	31%	27%	43%	48%	50%
I earn money/prizes out of it	0%	5%	1%	3%	2%
I want to fit in with other residents of the hall who are energy conscious	0%	0%	1%	2%	1%
It makes me feel good about myself	69%	49%	36%	28%	21%
Other people approve when I do	0%	7%	3%	2%	2%
I don't know why, I just do it.	2%	10%	15%	12%	15%

3.2.6.2 Barriers

Respondents were asked to select the three most important reasons for being less energy conscious from a list provided to them. The most important reason for being less energy conscious was the lack of feedback on how much they consumed (51% of total). Other important reasons were because the energy saved in the dormitories won't save students any money (33% of total), they have other things on their mind (26% of total) and limitations of the building's structure systems (23% of total). Another 23% of total number of respondents felt that nothing prevented them from being energy conscious.

The least important reasons for being less energy conscious were "sustainable living is not for me"(2% of total), "others will make fun of me" (3% of total) and "my university /college does not inspire me to act in this way" (7% of total).

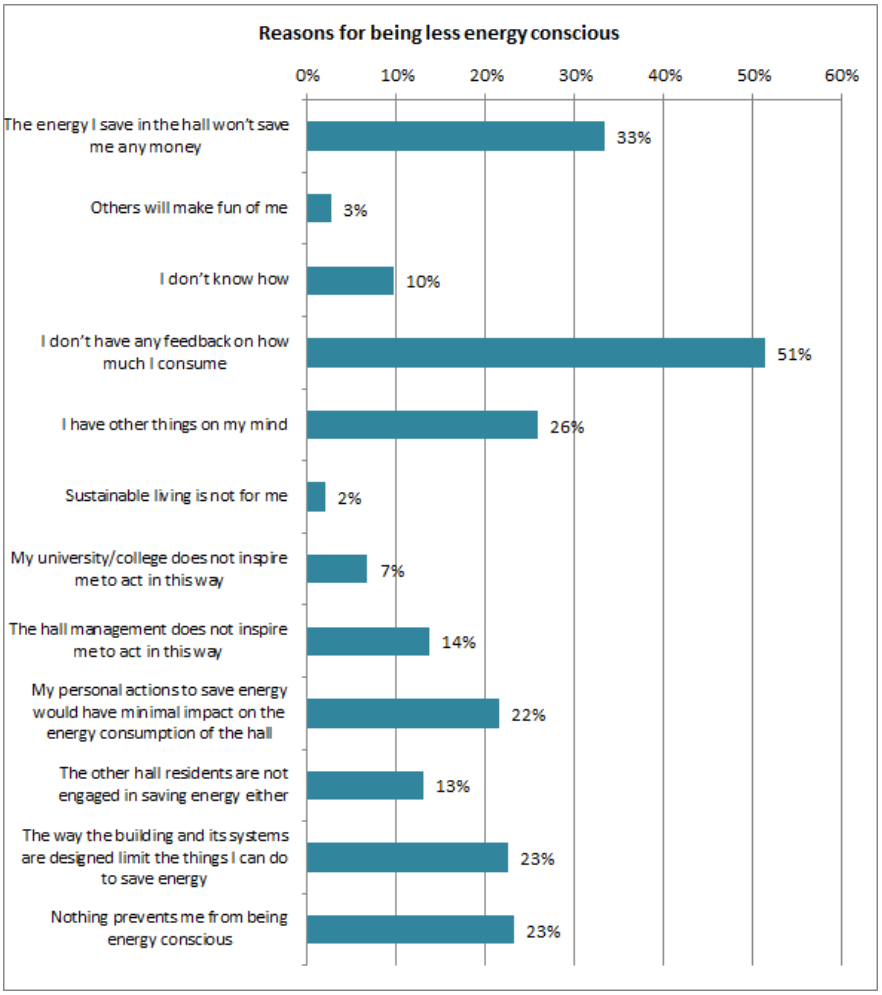

Figure 9 Reasons for being less energy conscious (total sample)

The ranking of reasons varied across countries.

In Cyprus 45% of respondents felt that nothing prevented them from being more energy conscious. The top three reasons for being less energy conscious were: lack of energy feedback, other things on mind and the perception that personal actions can have minimal impact on the hall's energy consumption. Only 2% of the respondents were less energy conscious because they didn't know how and because of lack of inspiration from the hall management.

In Greece 41% of respondents found it difficult to save energy due to limitations of the building and its systems, 37% were lacking feedback on how much they consume and 22% felt that their personal actions would have minimal impact on the energy consumption of the dormitory or were not inspired by the hall management. The three least important reasons for being less energy conscious were fear of being made fun of, not knowing how, other residents not engaging in energy saving, and sustainable living not being for them.

In Lithuania the most important reason for being less energy conscious were lack of feedback on how much they consume, lack of inspiration from the hall management to act in this way, the fact that energy saving does not save them money and limitations of the building or it's systems. The least important reasons were fear of being made fun of, sustainable living not being for them and not knowing how to save energy. Twenty-nine percent of respondents also thought that nothing prevented them from being more energy conscious.

In Sweden, the most important reason for being less energy conscious was the lack of consumption feedback. The fact that saving energy does not save money and having other things on their minds were also in the top three reasons for being less energy conscious. The least important reasons for being less energy conscious were sustainable living not being for them, fear of being made fun of and lack of inspiration from the university/college to act in an energy saving manner.

In the UK, the three most important reasons for being less energy conscious were lack of consumption feedback, the fact that energy savings do not lead to money savings and students having other things on their minds. The least important reasons for being less energy conscious were sustainable living not being for them, fear of being made fun of and lack of inspiration from the university/college and from the hall's managements to act in an energy saving manner.

Table 17 Reasons for being less energy conscious (per country)

Reason for being less energy conscious	**Cyprus**	**Greece**	**Lithuania**	**Sweden**	**UK**
The energy I save in the hall won't save me any money	14%	17%	29%	27%	37%
Others will make fun of me	5%	10%	1%	3%	3%
I don't know how	2%	10%	3%	14%	10%
I don't have any feedback on how much I consume	39%	37%	49%	56%	51%
I have other things on my mind	30%	15%	9%	24%	32%
Sustainable living is not for me	5%	7%	1%	2%	2%
My university/college does not inspire me to act in this way	5%	20%	15%	4%	5%
The hall management does not inspire me to act in this way	2%	22%	37%	15%	6%
My personal actions to save energy would have minimal impact on the energy consumption of the hall	23%	22%	20%	17%	24%
The other hall residents are not engaged in saving energy either	16%	10%	8%	12%	15%
The way the building and its systems are designed limit the things I can do to save energy	11%	41%	29%	21%	21%
Nothing prevents me from being energy conscious	45%	12%	29%	24%	21%

3.3 Results: Comparison with control group

For the purposes of additional evaluation of behavior change that can be attributed to Student Switch Off a control group from Linkoping, Sweden was recruited. The treatment group consists of the Stockholm and Gothenburg dormitories. Six-hundred and twenty one valid responses were collected from occupants of the control group buildings and 821 from the treatment group buildings (Table 1). A general comparison between the two groups is made in this report. A more thorough and meaningful comparison between the treatment and control group will be made in the follow-up version of this deliverable (D3.3 Quantifying the behavioural change and energy savings) with the final questionnaire responses.

3.3.1 Respondent characteristics

Significant gender differences were found between the groups ($\chi^2(4)=24.501$, $p<.001$). In the treatment group the number of female respondents was higher than the number of male respondents (48% female, 42% male) while in the control group the number of female respondents was lower than the number of male respondents (38% female, 48% male).

Significant differences were also found in the age groups that participated in the survey from the two groups ($\chi^2(5)=93.435$, $p<.001$). In both groups, almost half of the respondents were between 21-24 years of age. The control group had a large number of respondents in the age 18-20 (25% control group, 14% treatment group), while the treatment group had a larger number of respondents in the age 25-29 (24% treatment, 10% control group). Another 5% from the treatment group were in their thirties, whereas only 2% of control group respondents were that age.

Significant differences in the origin of students were also found between the two groups ($\chi^2(3)=169.532$, $p<.001$). More than half (58%) of the respondents of the control group were native while only 28% of the respondents from the treatment group were native. Sixty-five percent of the treatment group respondents were not from Sweden. In the control group, the percentage of non-native was 30%.

Table 18 Treatment and control group demographics

	Treatment	Control
Gender		
Male	42%	48%
Female	48%	38%
Other	0%	1%
Prefer not to say	3%	1%
skipped question	7%	12%
Age		
<17	0%	0%
18-20	14%	25%
21-24	48%	51%
25-29	24%	10%
>=30	5%	2%
prefer not to say	1%	0%
skipped question	7%	12%
Citizenship		
Native	28%	58%
EU citizen	36%	16%
non-EU citizen	29%	14%
skipped question	7%	12%
Year of study (% within country)		
1st Year University	6%	28%
2nd Year University	15%	17%
>2nd Year University	31%	27%
PGr - Masters	36%	24%
PGr - Doctorate	8%	0%
Other	4%	4%
skipped question	0%	0%

Subject of studies (% within country)		
Architecture / Engineering / Technology	32%	55%
Arts / Humanities	10%	8%
Health Sciences / Medicine	17%	10%
Mathematics / Physical Sciences	10%	8%
Social Sciences	31%	19%
skipped question	0%	0%

Significant differences were also found between the two groups in the year of study of the respondents ($\chi^2(5)=174.989$, $p<.001$). In the control group a good mix of students from different years and levels of education was found. In the treatment group 67% of respondents were in third year of their undergraduate studies or were studying for their master's degree.

Differences were also found in the subject of study of the respondents between the two groups ($\chi^2(4)=77.074$, $p=.008$). The biggest percentage of respondents studed architecture, engineering or technology in both groups but in the control group this number was higher (55% for control group, 32% for treatment group). A significant proportion of respondents from the treatment group also studied social sciences (31%).

3.3.2 Lifestyle

The respondents of the control group and the treatment group were also compared against their perception of current lifestyles in relation to energy saving. Two different questions were asked in this context.

3.3.2.1 Energy saving efforts in current lifestyle

No significant differences existed in the current lifestyle of respondents between the two groups ($\chi^2(5)=3.510$, $p=.622$). Almost a third of the respondents in both groups tried to save energy in most things they did, while more than 50% did from one or two things to quite a few to save energy in their everyday life (53% in treatment group, 52% in control group). The percentage of respondents that did nothing to save energy or tried to save energy in everything they did was similar for both answers and for both groups (approximately 7%).

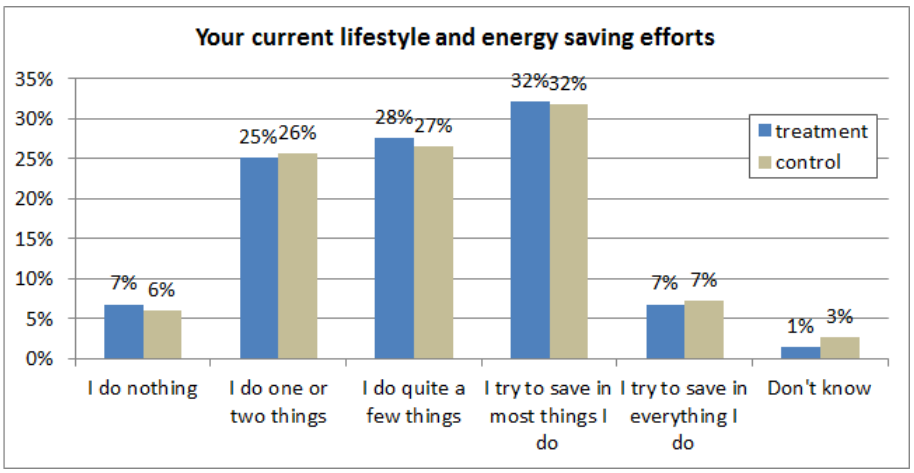

Figure 10 Energy saving efforts in current lifestyle (treatment and control group)

3.3.2.2 Opinion about energy saving efforts in current lifestyle

Differences were not significant between the two groups in the feelings about current efforts to save energy either ($\chi^2(3)=1.654$, $p=.647$). Almost half of the respondents from both countries would like to do a bit more to save energy in their current lifestyle (47% in treatment, 43% in control group). The number of respondents that were happy with what they did now was higher than the number of

respondents that would like to do a bit more in both groups (29% and 22%, respectively for treatment group; 32% and 23%, respectively for control group).

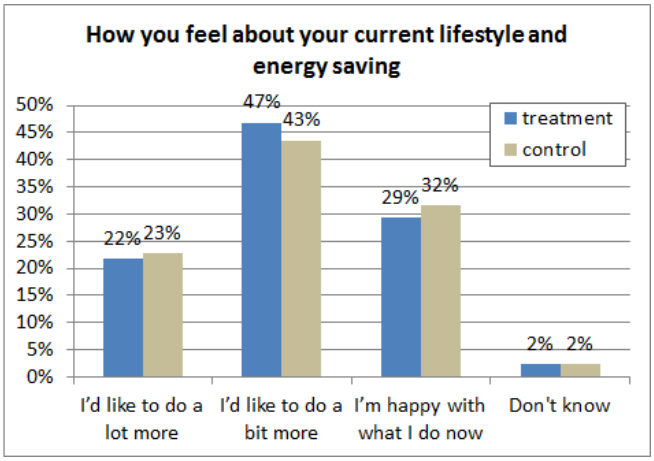

Figure 11 Opinion about energy saving efforts in current lifestyle (treatment and control group)

3.3.3 Knowledge

3.3.3.1 (Perceived) level of information

Respondents were asked to rate their level of information on a) their own energy consumption and b) the possibilities to save energy in their dormitories on a 1 to 5 scale (1= Very badly informed, 5 = Very well informed).

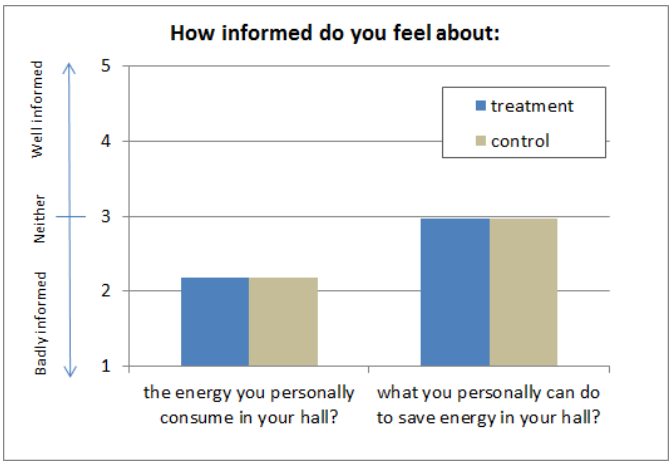

Figure 12 Mean values for perceived level of information on a) personal energy use and b) ways to save energy (treatment and control group)

No significant differences existed between the two groups for any of the two types of information ($\chi^2(4)=.434$ p=.980 for a); $\chi^2(4)=3.299$ p=.509 for b)). In both groups the perceived level of information on what can be done at personal level to save energy was noticeably higher than the level of information on what was actually consumed. In addition, the mean values for the two questions were almost identical for the two groups.

Table 19 Mean values and standard deviations for perceived level of information on a) personal energy use and b) ways to save energy (treatment and control group)

How informed do you feel about:	Group	M	SD
a. the energy you personally consume in your hall?	**treatment**	2.18	1.133
	control	2.19	1.138
b. what you personally can do to save energy in your hall?	**treatment**	2.97	1.098
	control	2.96	1.098

3.3.3.2 Awareness of energy saving actions

Students were asked to identify energy saving actions through a list of everyday actions. All of the actions provided were actual energy saving actions.

Switching off lights was the most recognized energy saving action in both groups (97% of respondents in the treatment group and 96% in the control group). The least recognized energy saving action was that of putting a lid on pans when cooking, but in the control group the percentage of respondents that were aware of this action was higher than the treatment group's (66% of respondents in the treatment group and 73% in the control group). This difference could possibly be attributed to the stronger engineering background of the control group.

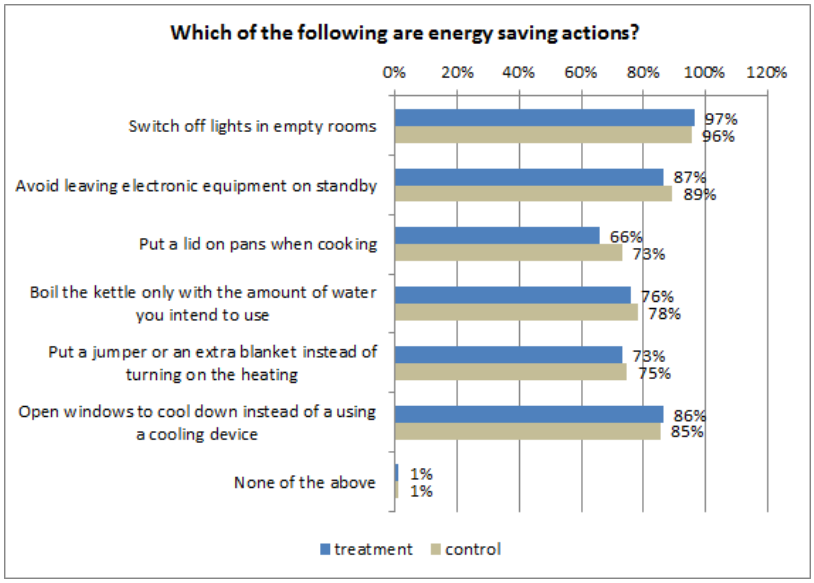

Figure 13 Awareness of energy saving actions (treatment and control group)

3.3.4 Habits and practices

Respondents were asked to give the frequency in which they performed each of the six target energy saving behaviours on a 1 to 5 scale (1= Never, 5 = Always).

Analysis showed no statistically significant difference between the groups in the frequency that any of the energy saving behaviours were followed (switch off lights ($\chi^2(4)=8.501$, p=.075), avoid leaving electronic equipment on stand-by ($\chi^2(4)=5.268$, p=.261), putting a lid is put on pans when cooking ($\chi^2(4)=6.569$, p=.161), the right amount of water is boiled in the kettle ($\chi^2(4)=7.659$, p=.105), an extra layer is applied instead of the heating ($\chi^2(4)=7.917$, p=.095), open windows as a mean of cooling ($\chi^2(4)=2.518$, p=.641).

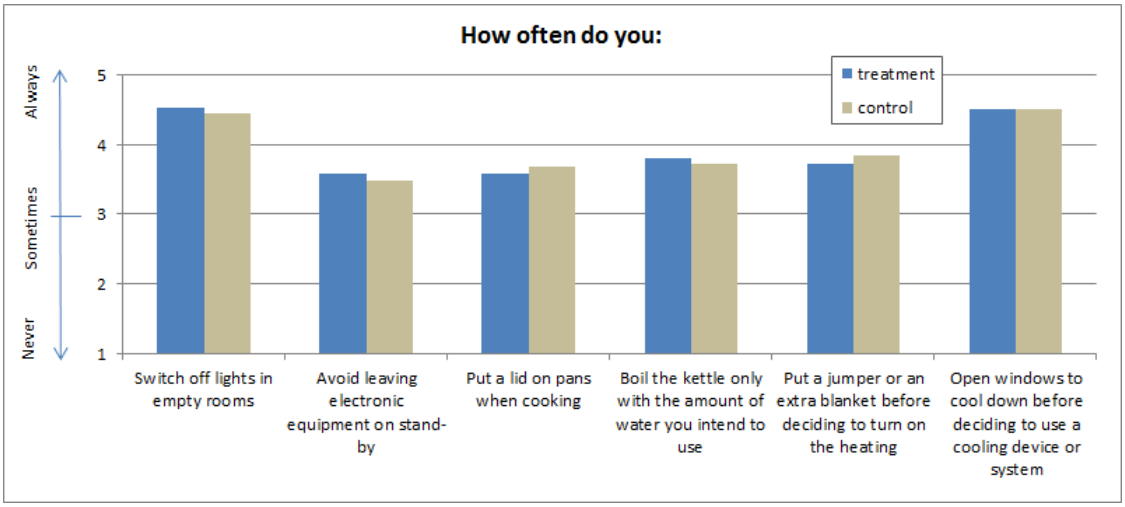

Figure 14 Mean values for frequency in which energy saving actions are performed (treatment and control group)

The energy saving actions followed most frequently in both groups were those of switching off lights and opening windows for cooling (Table 20). The action performed least often was that of avoiding leaving electronic equipment on stand-by in both groups. However, mean values were similar across actions: avoiding leaving electronic equipment on stand-by, putting a lid on pans, putting extra layers on and boiling only the right amount of water, across the two groups.

Table 20 Mean values and standard deviations for frequency in which energy saving actions are performed (treatment and control group)

Action	Country	M	SD
Switch off lights in empty rooms	**treatment**	4.53	.689
	control	4.44	.738
Avoid leaving electronic equipment on stand-by	**treatment**	3.58	1.109
	control	3.48	1.097
Put a lid on pans when cooking	**treatment**	3.59	1.181
	control	3.69	1.094
Boil the kettle only with the amount of water you intend to use	**treatment**	3.81	1.136
	control	3.72	1.092
Put a jumper or an extra blanket before deciding to turn on the heating	**treatment**	3.72	1.195
	control	3.84	1.089
Open windows to cool down before deciding to use a cooling device or system	**treatment**	4.51	.878
	control	4.51	.862

3.3.5 Behavioural antecedents

Overall, seven variables of behaviour change theory and models were measured with the survey. Items were evaluated on a five-point Likert Scale (1= Strongly disagree, 5 = Strongly Agree) with higher values indicating a higher level of agreement with the statement.

Personal norms

The two groups did not differ significantly in person norms ($\chi^2(4)=1.758$, p=.780). The feeling of moral obligation to save energy was strong in both groups (mean values close to 4).

Table 21 Mean values and standard deviations for personal norms (treatment and control group)

		Treatment group		Control group	
Personal norms		**M**	**SD**	**M**	**SD**
	I feel morally obliged to save energy	3.91	.966	3.87	.993

Ascription of responsibility

Difference between the two groups was not statistically significant for ascription of responsibility either ($\chi^2(4)=1.140$, p=.888). The level of responsibility that respondents seemed to take for climate change was significant in both groups (mean values > 4.00).

Table 22 Mean values and standard deviations for ascription of responsibility (treatment and control group)

		Treatment group		Control group	
Acription of responsibility		**M**	**SD**	**M**	**SD**
	Everyone including myself is responsible for climate change	4.34	.889	4.38	.861

Awareness of consequences

The difference in awareness of consequences was not statistically significant between the two groups ($\chi^2(4)=6.838$, p=.145) and awareness was rather high in both groups (mean value > 4.00).

Table 23 Mean values and standard deviations for awareness of consequences (treatment and control group)

		Treatment group		Control group	
Awareness of consequences		**M**	**SD**	**M**	**SD**
	Energy conservation contributes to a reduction of the climate change impacts	4.36	.818	4.38	.840

Attitudes

Difference in attitudes between the two groups was not significant either ($\chi^2(4)=5.740$, p=.219). Disagreement with the statement that saving energy means less comfortable living was rather high in both groups (mean value <3).

Table 24 Mean values and standard deviations for attitudes (treatment and control group)

		Treatment group		Control group	
Attitude		**M**	**SD**	**M**	**SD**
	Saving energy means I have to live less comfortably	2.46	.991	2.52	1.064

Perceived behavioural control

No statistically significant differences were found in perceived behavioural control between the two groups ($\chi^2(4)=8.057$, p=.090). Respondents tended to disagree slightly more rather than agree (mean values close to neutral but <3) that they have complete control over how much energy they use.

Table 25 Mean values and standard deviations for perceived behavioural control (treatment and control group)

	Treatment group	Control group

Perceived behavioral control		M	SD	M	SD
	I feel in complete control over how much energy I use	2.83	.974	2.79	1.042

Emotions

No statistically significant differences in emotions existed between the two groups ($\chi^2(4)=4.454$, p=.348). Saving energy seemed to have a positive impact on both groups' emotions (mean values close to 4).

Table 26 Mean values and standard deviations for emotions (treatment and control group)

		Treatment group		Control group	
Emotions		**M**	**SD**	**M**	**SD**
	Doing things to save energy makes me happy	3.85	.846	3.79	.864

Role beliefs

Significant differences were not found in the role beliefs of the two groups either ($\chi^2(4)=2.706$, p=.608). The perception that as residents dormitories respondents should be more concerned about their energy consumption was more positive than negative in both groups (mean values close to neutral but >3).

Table 27 Mean values and standard deviations for role beliefs (treatment and control group)

		Treatment group		Control group	
Role beliefs		**M**	**SD**	**M**	**SD**
	As a resident of the dorms I should be more concerned about my energy use during my stay there	3.44	.964	3.36	.991

3.3.6 Opportunities for energy saving

3.3.6.1 Incentives

Respondents were asked to select the three most important reasons for being more energy conscious from a list provided to them.

The two most important reasons were "it's a habit I adopted from home" and "it saves energy" in both groups. In the treatment group, the third most important reason was "it's the right thing to do" while in the control group it was "it helps reduce global warming".

The least important reasons (1% to 3% of respondents) for being more energy conscious in both groups were those associated with other peoples' opinion, namely, fitting in with other residents of the dormitory, other peoples' approval and someone else asking but also to earn money or prizes out of it.

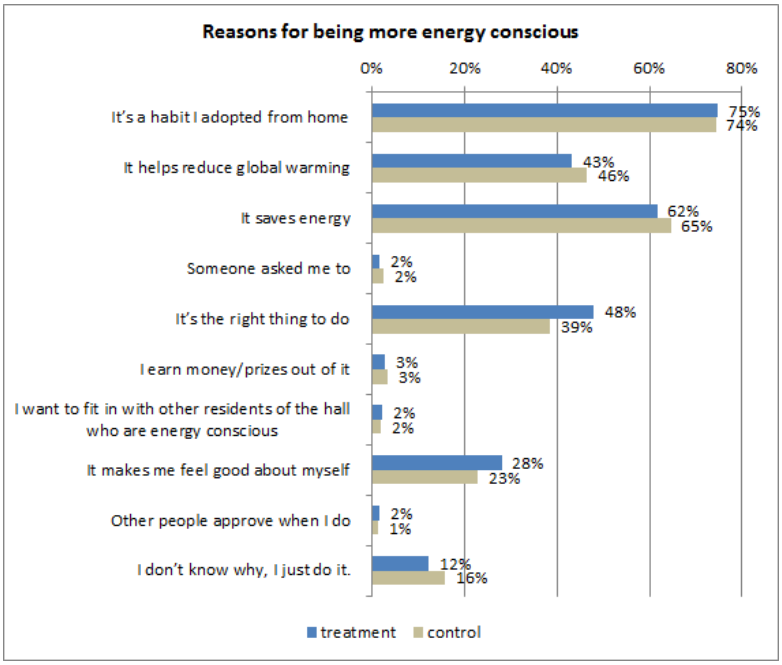

Figure 15 Reasons for being more energy conscious (treatment and control group)

3.3.6.2 Barriers

Respondents were asked to select the three most important reasons for being less energy conscious from a list provided to them.

The most important reason for being less energy conscious was the lack of consumption feedback and was selected by more than 50% of respondents in both groups. The second and third most important reasons were again common for both groups but were selected by less than half of those selecting the first most important reason. Those were the fact that saving energy does not save money and having other things on mind. In both groups, the option "nothing prevents me from being energy conscious" was also selected by a significant number of respondents (24% in both groups).

The least important reasons (2% to 4% of respondents) for being less energy conscious were common for both groups. Those were sustainable living not being for them, fear of being made fun of and lack of inspiration from the university/college to act in an energy saving manner.

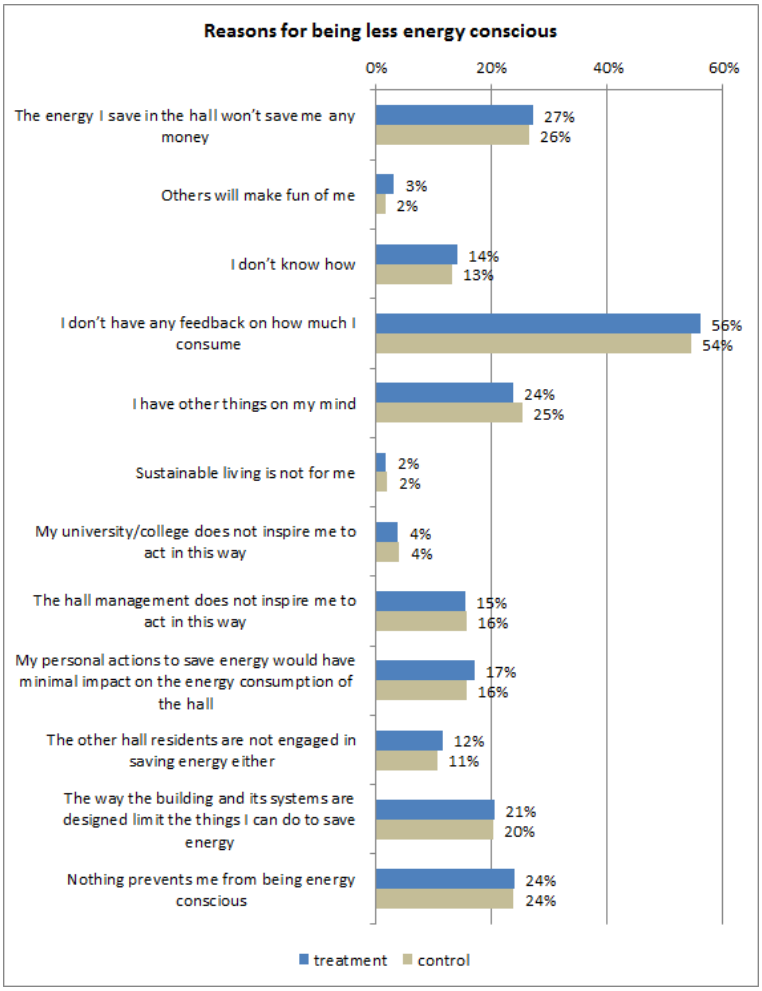

Figure 16 Reasons for being less energy conscious (treatment and control group)

3.4 Summary of main findings

DEMOGRAPHICS

Gender

- Significant differences in gender existed across countries (p<.001). Differences were also found between the treatment and the control group (p<.001).
- A higher number of female respondents took the survey (50% female, to 37% male). The number of female respondents was higher than the number of male respondents in Cyprus, Lithuania, Sweden and the UK. In Greece a good mix of male and female respondents was found. The largest percentage of female respondents was found in Cyprus (70% female) while the largest percentage of male respondents was found in Sweden and in Greece (around 40% in each).
- The number of male respondents was higher than for female respondents in the control group. 48% of respondents were male in the control group against 42% male in the treatment group (with 38% and 48% female, respectively).

Age

- Significant differences in the age of respondents were found across countries and between the treatment and control group (p<.001).
- The majority of respondents was between 18-24 years of age in all countries. In Sweden and in Greece a large percentage of respondents (24% in each) was also between 25-29 years of age.
- Almost half of the respondents in both the treatment and control group were between 21-24 years of age. Almost one third of respondents from the treatment group were between 24-35 years of age while only 14% from the control group was in that age group. The control group had a large number of respondents in the age 18-20 (25% control group, 14% treatment group), while the treatment group had a larger number of respondents in the age 25-29 (24% treatment, 10% control group). Another 5% from the treatment group were in their thirties, whereas only 2% of control group respondents were of that age.

Nationality

- Across individual countries and between the treatment and control group significant differences were found in the origin of the students studying there (p<.001).
- The majority of total respondents were native to the country they studied in (54% of total). In the UK, but especially in Sweden, students came from many parts of the world. On the other hand, in Lithuania and Greece students were mostly native. In Cyprus students were either native or from other EU countries.
- More than half (58%) of the respondents of the control group were native while only 28% of the respondents from the treatment group were native. Sixty-five perecent of the treatment group respondents were non-native. In the control group, the percentage of non-native was 30%.

Level of education

- At project level, a good mix of students from different years and levels of education was found. The majority of total respondents were in their first year in university (47%) followed by students doing their masters (21%).
- Significant differences in the level of studies of the respondents were observed across individual countries and between the treatment and control group (p<.001).
- A small number of respondents from Sweden and the UK (3% of respondents) selected the "other" option. These students were mainly exchange students (Erasmus or international).
- In Cyprus and Greece a large number of respondents were in third year or higher of their undergraduate studies (40% and 47%, respectively). The majority of respondents (92%) from Lithuania were undergraduates. In Sweden a good mix of undergraduates and post-graduates was observed (52% and 48%, respectively). Sixty-five percent of students in the UK were in their first year of studies and 21% are doing their masters.
- In the control group a good mix of students from different years and levels of education was found. In the treatment group 67% of respondents were in third year of their undergraduate studies or were studying for their master's degree.

Subject of study

- Respondents studied all main subjects in all countries, but subjects studied across countries varied significantly ($p<.001$). Differences were also found in the subject of studies between treatment and control group respondents ($p<.05$).
- Overall, an equal percentage of respondents (~30%) studied architecture, engineering, technology or social sciences. Arts and Humanities were studied by 17% of the total sample while the least represented subjects of study were those of health sciences and medicine and of mathematics and physical sciences (11% and 13% of respondents, respectively).
- In Lithuania a large number of students (56% of respondents) studied architecture, engineering or technology and were assumed to have the highest level of energy awareness. In Cyprus this number is rather low (12% of respondents). For the remaining countries the percentage was between 20%-32%.
- The biggest percentage of respondents studied architecture, engineering or technology in both groups but in the control group this number was higher (55% for control group, 32% for treatment group). A significant proportion of respondents from the treatment group also studied social sciences (31%).

Living in dorms status

- Three quarters of total respondents did not live in dorms of their current dormitory provider/university the previous academic year. At country level this was mostly the case for the UK (95%) and Sweden at a smaller extent (58%). In Cyprus, Greece and Lithuania the majority of respondents lived in the same dorms the previous academic year (70%, 78% and 62%, respectively) and were therefore very likely to have heard of or been involved in Student Switch Off.

LIFESTYLE

Energy saving efforts in current lifestyle

- The number of respondents that do nothing to save energy varied between 0% (for Cyprus) and 13% (for Greece). The percentage of respondents that tried to save energy in most things or everything they did varied between 34% (UK) and 74% (Cyprus) across countries. On the other hand, the biggest percentage of respondents that did one or two or quite a few things to save energy was found in the UK (60%) and the lowest in Cyprus (26%).
- In Cyprus, 65% of respondents tried to save energy in most things they did. In all other countries, a fair share of respondents tried to either do one or two things, do quite a few things or try to save energy in most things they do in their everyday life.
- The energy saving efforts in the current lifestyle of treatment and the control group were very similar. Almost a third of the respondents in both groups tried to save energy in most things they did, while more than 50% did from one or two things to quite a few to save energy in their everyday life (53% in treatment group, 52% in control group). The percentage of respondents that did nothing to save energy or tried to save energy in everything they did was similar for both answers and for both groups (approximately 7%).

Opinion about energy saving efforts in current lifestyle

- A fair proportion of students selected all three opinions options in all countries.
- In Cyprus a good distribution of answers was found (30% lowest percentage -"I'd like to do a bit more"- 35% highest percentage –"I'm happy with what I do now"-). In all other countries the most popular answer was "I'd like to do a bit more to save energy" with >40% of answers in each country.
- The feelings about current efforts to save energy were similar for the treatment and the control group. Almost half of the respondents from both countries would like to do a bit more to save energy in their current lifestyle (47% in treatment, 43% in control group). The number of respondents that were happy with what they did now was higher than the number of respondents that would like to do a bit more in both groups (29% and 22%, respectively for treatment group; 32% and 23%, respectively for control group).

KNOWLEDGE

(Perceived) level of information

- Significant differences existed across countries in the perceived level of information on a) own energy consumption and b) the possibilities to save energy in halls of residence ($p<.001$). Between the treatment and control group no statistically significant differences were found for any of the two types of information ($p>.01$).

- In all countries and the control group the perceived level of information on what can be done at personal level to save energy was noticeably higher than the level of information on what was actually consumed.
- Overall, respondents felt badly informed about their own energy consumption (overall mean value <3). The highest level of information on own energy consumption was found in Cyprus (mean value of 3.16) and the lowest in Greece (mean value of 1.98).
- On what can be done at personal level to save energy the overall level of information was closer to neutral (overall mean value of 3.19). The highest level of information on what can be done to save energy in dormitories was again found in Cyprus (mean value of 4.19) and the lowest in Greece and Lithuania (mean values of 2.74 and 2.76, respectively).
- The mean values for the two questions were almost identical for the two groups.

Awareness of energy saving actions

- The energy saving action that the majority of respondents were aware of in all countries and the control group was that of switching off lights in empty rooms. The percentage of respondents that were aware of this action was >95% in the control group and in all countries except for Greece. In Greece this percentage wa 74%.
- Boiling the kettle only with the necessary amount of water was the least recognized action in Greece and in Lithuania. Putting a lid on pans when cooking was the least recognized action in Cyprus, Sweden, the UK and in Lithuania (same percentage as for "boiling only the right amount of water").
- The least recognized energy saving action in the treatment and control group was that of putting a lid on pans when cooking, but in the control group the percentage of respondents that were aware of this action was higher than the treatment group (66% of respondents in the treatment group and 73% in the control group). This difference could possibly be attributed to the stronger engineering background of the control group.

HABITS AND PRACTICES

- Statistically significant differences were found in the frequency that all six targeted behaviours were performed across countries ($p<.001$). Between the treatment and control group no significant difference was found for any of the six behaviours ($p>.01$).
- At country level, switching off lights was the action performed morst frequently in all countries. This action had high habit strength in Cyprus, Lithuania, Sweden and the UK as it was applied more than often (mean value > 4.00).
- Putting a lid on pans when cooking was the least applied energy saving action in Cyprus and the UK (mean values of 3.69 and 3.31, respectively). In Greece boiling the right amount of water in the kettle was the action applied least frequently (mean value of 2.89). In Sweden, avoiding leaving equipment on stand-by and putting a lid on pans were the actions followed least often (mean value of 3.58 and 3.59, respectively) while in Lithuania the action followed the least often was that of putting an extra layer on before turning on the heating (mean value of 3.54).
- The energy saving actions followed most frequently in both the treatment and control group were those of switching off lights and opening windows for cooling. The action performed the least often was that of avoiding leaving electronic equipment on stand-by in both groups.
- The frequency of: avoiding leaving electronic equipment on stand-by, putting a lid on pans, putting extra layers on and boiling only the right amount of water were very similar in value in each group and were also similar across the two groups.

BEHAVIORAL ANTECEDENTS

- At project level, overall results indicate a more positive attitude towards energy saving and a high level of ascription of responsibility but also a high level of awareness of the impacts of energy consumption on the environment.

Personal norms

- The differences across countries were significant ($p<.001$). The feeling of moral obligation to save energy was rather strong in Cyprus, Lithuania, Sweden and the UK (mean values range between 3.80 (in Lithuania) and 4.30 (in Cyprus). In Greece the feeling of moral obligation to save energy wass closer to neutral (mean value of 3.02).
- Between the treatment and control group no significant differences were found ($p>.01$). The feeling of moral obligation to save energy was strong in both groups (mean values close to 4).

Ascription of responsibility

- Differences in ascription of responsibility were significant across countries ($p<.001$). Respondents in all countries seemed to agree more rather than disagree that they were responsible for climate change. Mean values across countries ranged between 3.11 (in Greece) and 4.38 (in Lithuania).
- Between the treatment and control group no significant differences were found ($p>.01$). The level of responsibility that respondents seemed to take for climate change was significant (mean values > 4.00).

Awareness of consequences

- Difference in awareness of consequences was significant across countries ($p<.001$). Awareness of the consequences that energy consumption has on the climate was rather high in all countries as mean values ranged between 3.60 (in Greece) and 4.44 (in Cyprus).
- Between the treatment and control group no significant differences were found ($p>.01$). Awareness was rather high in both groups (mean value > 4.00).

Attitudes

- The differences across countries were significant ($p<.01$). In Cyprus, Lithuania, Sweden and the UK respondents tended to disagree rather than agree with the statement that saving energy means that they have to live less comfortably. In Greece respondents tended to agree more with the statement.
- Between the treatment and control group no significant differences were found ($p>.01$). Disagreement with the statement that saving energy means less comfortable living was rather high in both groups (mean value <3).

Perceived behavioural control

- The differences in perceived behavioural control across countries were significant ($p<.001$). The perception of control over how much energy was used was stronger in Cyprus and closer to neutral in Greece, Lithuania, Sweden and the UK.
- Between the treatment and control group no significant differences were found ($p>.01$). Respondents in the two groups tended to disagree slightly more rather than agree (mean values close to neutral but <3) that they have complete control over how much energy they use.

Emotions

- Significant differences were found in the impact that emotions have on energy consumption across countries ($p<.001$). Overall, saving energy seemed to have some impact on emotions in all the countries as mean values ranged between 3.60 (in Greece) and 4.23 (in Cyprus).
- Between the treatment and control group no significant differences were found ($p>.01$). Saving energy seemed to have a positive impact on both groups' emotions (mean values close to 4).

Role beliefs

- Differences in role beliefs were found to be significant across countries ($p<.001$). Respondents tended to agree more rather than disagree with the perception that as residents of the dormitories they should be more concerned about their energy consumption. Mean values across countries ranged between 3.2 (in Greece) and 3.98 (in Cyprus).
- Between the treatment and control group no significant differences were found ($p>.01$). The perception that as residents of dormitories respondents should be more concerned about their energy consumption was more positive than negative in both groups (mean values close to neutral but >3).

OPPORTUNITIES FOR ENERGY SAVING

Incentives

- The most important reasons for being more energy conscious were common for all countries and for the control group. Those were:
  - it is a habit students adopted from home
  - it saves energy
  - it is the right thing to do, and
  - it helps reduce global warming.
- The least important reasons were common for all countries and the control group and were those associated with other peoples' opinion namely fitting in with other residents of the dormitory, other peoples' approval and someone else asking but also that of earning money or prizes out of it.

Barriers

- The most important reasons for being less energy conscious were common for all countries and for the control group. Those were:
    - lack of feedback on how much is consumed
    - the fact that energy saved in the halls won't save students any money
    - that they have other things on their mind, and
    - limitations of the building's structure and its systems.
- A large number of respondents (23% of total) also felt that nothing prevented them from being energy conscious.
- The least important reasons for being less energy conscious were sustainable living not being for them, fear of being made fun of and lack of inspiration from the university/college to act in an energy saving manner.
- The ranking of the more and the less important reasons for being less energy conscious varied across countries.
- In Cyprus 45% of respondents felt that nothing prevented them from being more energy conscious. The top three reasons for being less energy conscious were: lack of energy feedback, other things on mind and the perception that personal actions can have minimal impact on the hall's energy consumption. In Greece the top reasons were: it is difficult to save energy due to limitations of the building and its systems, lack of feedback on how much they consume, the feeling that personal actions will have minimal impact on energy consumption and lack of inspiration by the hall management. In Lithuania the most important reasons for being less energy conscious were lack of feedback on how much they consume, lack of inspiration from the hall management to act in this way, the fact that energy saving does not save them money and limitations of the building or its systems. Twenty-nine percent of respondents also thought that nothing prevented them from being more energy conscious. In Sweden, the most important reason for being less energy conscious was the lack of consumption feedback. The fact that saving energy did not save money and having other things on their minds were also in the top three reasons for being less energy conscious. In the UK, the three most important reasons for being less energy conscious were lack of consumption feedback, the fact that energy savings do not lead to money savings and students having other things on their minds.
- The least important reasons for being less energy conscious in Cyprus were not knowing how and lack of inspiration from the hall management. The three least important reasons for being less energy conscious in Greece were fear of being made fun of, not knowing how, other residents not engaging in energy saving, and sustainable living not being for them. The least important reasons in Lithuania were fear of being made fun of, sustainable living not being for them and not knowing how to save energy. The least important reasons for being less energy conscious in Sweden were sustainable living not being for them, fear of being made fun of and lack of inspiration from the university/college to act in an energy saving manner. In the UK the least important reasons for being less energy conscious were sustainable living not being for them, fear of being made fun of and lack of inspiration from the university/college and from the hall's managements to act in an energy saving manner.
- In the treatment and the control groups the most important reason for being more energy conscious was the lack of consumption feedback and was selected by more than 50% of respondents in both groups. The second and third most important reasons were again common for both groups but were selected by less than half of those selecting the first most important reason. Those were the fact that saving energy did not save money and having other things on mind. In both groups, the option "nothing prevents me from being energy conscious" was also selected by a significant number of respondents (24% in both groups).
- The least important reasons (2% to 4% of respondents) for being less energy conscious were common for both groups. Those were sustainable living not being for them, fear of being made fun of and lack of inspiration from the university/college to act in an energy saving manner.

Appendix A – Baseline questionnaire survey, Year 2 (UK version)

*** 1. Do you currently live, or will be living, in halls of residence this academic year?**

- ○ Yes
- ○ No

*** 2. Which university/college do you currently study at?**

*** 3. What best describes your living situation in halls of residence:**

- ○ This is the first year that I am living in halls of residence at this university
- ○ I lived in halls of residence at this university in the previous academic year

*** 4. What year of study are you currently in?**

- ○ 1st Year University/College
- ○ 2nd Year University/College
- ○ >2nd Year University/College
- ○ Post Graduate - Studying for Masters
- ○ Post Graduate - Studying for Doctorate
- ○ Other (please specify)

*** 5. Which one subject best describes your course or degree?**

- ○ Architecture / Engineering / Technology
- ○ Arts / Humanities
- ○ Health Sciences / Medicine
- ○ Mathematics / Physical Sciences
- ○ Social Sciences

*** 6. Which <u>one</u> of these statements would you say best describes your current lifestyle?**

- ○ I don't really do anything to save energy
- ○ I do one or two things to save energy
- ○ I do quite a few things to save energy
- ○ I try to save energy in most things I do
- ○ I try to save energy in everything I do
- ○ Don't know

*** 7. Which <u>one</u> of these statements best describes how you feel about your current lifestyle and energy saving?**

- ◯ I'd like to do a lot more to save energy
- ◯ I'd like to do a bit more to save energy
- ◯ I'm happy with what I do at the moment
- ◯ Don't know

*** 8. How informed do you feel about:**

	Very badly informed	Fairly badly informed	Neither well nor badly informed	Fairly well informed	Very well informed
the energy you personally consume in your hall?	◯	◯	◯	◯	◯
what you personally can do to save energy in your hall?	◯	◯	◯	◯	◯

9. Please consider each of the statements below, and indicate to what extent you agree or disagree with it.

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
Doing things to save energy makes me happy	◯	◯	◯	◯	◯
I feel in complete control over how much energy I use	◯	◯	◯	◯	◯
Energy saving contributes to a reduction of climate change impacts	◯	◯	◯	◯	◯
Saving energy means I have to live less comfortably	◯	◯	◯	◯	◯
As a resident of a hall of residence I should be more concerned about my energy use during my stay there	◯	◯	◯	◯	◯
Everyone including myself is responsible for climate change	◯	◯	◯	◯	◯
I feel morally obliged to save energy	◯	◯	◯	◯	◯

*** 10. Which of the following actions do you think can help save energy? [Select all that apply]**

- [ ] Switch off lights in empty rooms
- [ ] Avoid leaving electronic equipment on standby
- [ ] Put a lid on pans when cooking
- [ ] Boil the kettle only with the amount of water you intend to use
- [ ] Put a jumper or an extra blanket instead of turning on the heating
- [ ] Open windows to cool down instead of a using a cooling device or system
- [ ] All of the above
- [ ] None of the above

*** 11. Please consider each of the actions below, and indicate how often you take them.**

	Never	Rarely	Sometimes	Often	Always
Switch off lights in empty rooms	○	○	○	○	○
Avoid leaving electronic equipment on stand-by	○	○	○	○	○
Put a lid on pans when cooking	○	○	○	○	○
Boil the kettle only with the amount of water you intend to use	○	○	○	○	○
Put a jumper or an extra blanket before deciding to turn on the heating	○	○	○	○	○
Open windows to cool down before deciding to use a cooling device or system	○	○	○	○	○

* **12. Considering only the energy saving actions, from the previous question, that you take most frequently, please choose up to three important reasons for taking them.**

	Most important reason
It's a habit I adopted from home	
It helps reduce global warming	
It saves energy	
Someone asked me to	
It's the right thing to do	
I earn money/prizes out of it	
I want to fit in with other residents of the hall who are energy conscious	
It makes me feel good about myself	
Other people approve when I do	
I don't know why, I just do it.	

*** 13. Please choose up to three important reasons that prevent you from being more conscious about your energy use in your hall, from the list below.**

	Most important reason
The energy I save in the hall won't save me any money	
Others will make fun of me	
I don't know how	
I don't have any feedback on how much I consume	
I have other things on my mind	
Sustainable living is not for me	
My university/college does not inspire me to act in this way	
The hall management does not inspire me to act in this way	
My personal actions to save energy would have minimal impact on the energy consumption of the hall	
The other hall residents are not engaged in saving energy either	
The way the building and its systems are designed limit the things I can do to save energy	
Nothing prevents me from being energy conscious	

Other (please specify)

*** 14. Please state your gender.**

- ◯ Male
- ◯ Female
- ◯ In another way
- ◯ I would prefer not to say

*** 15. Which category below includes your age?**

- ◯ 17 or under
- ◯ 18-20
- ◯ 21-24
- ◯ 25-29
- ◯ 30 or over
- ◯ I would prefer not to say

*** 16. Which of the following statements best describes you?**

- ◯ I am a UK citizen studying in the UK
- ◯ I am an International student from within the EU studying in the UK
- ◯ I am an International student from outside the EU studying in the UK

Appendix B - Changes to the questionnaire survey in Year 2

In year 2 of the campaign some minor adjustments were made to the questionnaire survey. These adjustments were either additions of questions to help increase clarity in some areas or removal of questions to help eliminate respondent fatigue. The adjustments involve a very small number of questions that were either found to be too long in length or did not give strong findings at the end of the year. These questions were either reduced to the minimum necessary length or were removed. The study variables removed from the methodology in year 2 are the following:

Lifestyle

- *Future lifestyle and energy saving*

The item was measured on a 6-point scale 1 'I think I'll be doing a lot more to save energy' to 5 'I think I'll be doing a lot less to save energy' and 6 'Don't know'.

Socio – psychological variables

- *Personal norm (PN)*

Norms defined as the perceived social pressure to perform or not to perform the behaviour in question. Two items were used to measure Personal norm ("I feel morally obliged to save energy" and "I feel guilty when I use a lot of energy"). The second item was removed.

- *Attitudes (ATT)*

Attitude refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behaviour in question.
Two items were used to measure respondents' attitudes toward energy saving ('Saving energy is too much of a hassle' and 'Saving energy means I have to live less comfortably"). The first item was removed.

- *Perceived Behavioural Control (PBC)*

Perceived behavioural control refers to the perceived ease or difficulty of performing a behaviour and is assumed to reflect past experience as well as anticipated impediments and obstacles.
Perceived behavioural control was measured through an item measuring self-efficacy ("I can reduce my energy use quite easily") and an item measuring controllability ("I feel in complete control over how much I use"). The self-efficacy item was removed.

- *Subjective norms (SN)*

Subjective norm tries to explain the opinions that others may have about the behaviour. It was measured through two items. The injunctive item ("Most people who are important to me think that I should use less energy") measures respondents' perceptions of what they believe others would want them to do regarding energy saving while the descriptive item ("Most people who are important to me try to pay attention to their energy use") measures the extent to which respondents believe that people that are important to them try to pay attention to their own energy use. Both items were removed.

- *Intention (INT)*

Intentions are considered immediate antecedents of behaviour.
Intention was measured through the item "I intend to try harder to reduce my energy use this academic year" and was removed in year 2 of the survey.

Appendix C – Variables from behaviour change theory and models

Variable	Item code	Items	NAM	TPB	TIB	Maintained in Year 2
Personal norms	PN-1	I feel morally obliged to save energy	√		√	**Y**
	PN-2	I feel guilty when I use a lot of energy				
Ascription of responsibility	AR-1	Everyone including myself is responsible for climate change	√			**Y**
Awareness of consequences	AC-1	Energy conservation contributes to a reduction of the climate change impacts	√			**Y**
Attitude	ATT-1	Saving energy is too much of a hassle		√	√	
	ATT-2	Saving energy means I have to live less comfortably				**Y**
Perceived behavioural control (self-efficacy and controllability)	PBC-1	I can reduce my energy use quite easily		√		
	PBC-2	I feel in complete control over how much energy I use				**Y**
Subjective norm (injunctive and descriptive)	SN-1	Most people who are important to me think that I should use less energy		√		
	SN-2	Most people who are important to me try to pay attention to their energy use				
Emotions	EMO-1	Doing things to save energy makes me happy			√	**Y**
Role beliefs	ROL-1	As a resident of the dorms I should be more concerned about my energy use during my stay there			√	**Y**
Intention	INT-1	I intend to try harder to reduce my energy use this academic year		√	√	

NAM: Norm Activation Model
TPB: Theory of Planned Behaviour
TIB: Triandis' Theory of Interpersonal Behaviour

Appendix D – Energy Baseline Template

Depending on how your halls are heated (or cooled) depends on whether we need degree data or not.
If your halls are electrically heated then we need the degree day data
Use the 'notes' column to draw attention to any major infrastructure change that may affect electricty usage
Also note whether or not the hall data is generated by multiple meters.

TEMPLATE

				BASELINE											
				2013				2014							
University Name	Dorm name	Student no.s	Electrically heated (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Degree day data (if applicable) - if not put N/A			Heating Degree Day												
			Cooling Degree Day												
				Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
				Degree day data											

ACTUAL USAGE																					
2014				2015										2016					
Sep	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun

ADJUSTED BASELINE									
Sept	Oct	Nov	Dec	Jan	Feb	March	Apr	May	June
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun

SAVES