Project Acronym: SAVES
Project Title: Students Achieving Valuable Energy Savings
Contract Number: IEE/13/719/SI2.675836
Project Duration: 01/04/2014 – 31/03/2017

Deliverable reference number and title:

D3.2: Quantifying baseline consumption and pre-intervention behaviours – Year 1

January 2015
Updated in May 2016

Authors:

Marina Laskari	University of Athens (UoA)
Richard Bull	De Montfort University (DMU)
Joanna Romanowicz	National Union of Students - UK (NUS)

Contents

List of figures

List of tables

Executive Summary

Student Switch Off (SSO) is an inter-dormitory energy-saving competition run in 475 dormitories managed by 17 different university housing providers, housing 24,976 students in five countries over the academic years 2014/15 and 2015/16 (49,952 students in total over 2 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 both monitoring 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 deliverable (D3.2) presents an overview of the Student Switch Off evaluation methodology and the findings of the baseline energy and baseline questionnaire survey analysis. The main evaluation period for this report is academic year 2014-2015.

ENERGY DATA

The approach to conducting the energy analysis has been presented. A 'bespoke' methodology had to be developed due to the inconsistent quality and in many cases, missing energy data across the dorm providers. This approach though has been tried and tested through many years of analysing data from Student Switch-Off competitions and is well proven. For each dorm provider a series of assumptions were applied, where relevant, to take into account a wide variety of expertise and installation with regards to energy data.

At the end of the academic years 2014/15 and 2015/16 the baseline data set out in this document will be compared to actual usage in 2014/15 and 2015/16 to calculate whether savings have been made.

QUESTIONNAIRE 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.

Demographics

A good mix of male and female respondents answered the questionnaire in all countries. The biggest majority of respondents is between 17-24 years of age. The majority of total respondents are native to the country they study in. In the UK, and in Sweden, students come from many parts of the world. On the other hand, in Lithuania and Greece students are only native. In Cyprus students are either native or from other EU countries.

A good mix of students from different years and levels of education is also found. The majority of total respondents are in their 1st year in university followed by students doing their masters (22%). In Sweden and the UK exchange students (Erasmus or international), top-up students or research associates are also found.

Respondents study all main subjects in all countries, but subjects studied across countries vary significantly. Overall, the biggest percentage of total respondents (37%) study architecture, engineering or technology, 21% study social sciences, 16% study mathematics and physical sciences, 14% study arts and humanities and 11% study health sciences and medicine. In Greece, Lithuania and Sweden (both treatment and control group) the number of students studying architecture, engineering or technology, and therefore are assumed to have the best level of knowledge or awareness of energy saving issues, is high. In Cyprus this number is rather low (15% of respondents) while for the UK it is 28%.

Lifestyle

As far as lifestyle is concerned, only a small percentage of respondents from all countries, think that they do nothing to save energy in their current lifestyle. The biggest percentage of respondents in the control group and in all countries, apart from Greece, would like to do a bit more to save energy in their current lifestyle. In Greece the majority of respondents would like to do a lot more to save

energy. Only a marginal number of respondents think that they will be doing less than what they are currently doing in their dormitories in the future in all countries and in the control group.

Knowledge

In all countries and the control group the perceived level of information on what can be done at personal level to save energy is noticeably higher than the level of information on what is actually consumed. Between the treatment and control group no statistically significant difference is found for any of the two types of information. Overall, respondents feel badly informed about their own energy consumption. On what can be done at personal level to save energy the overall level of information is closer to neutral.

The energy saving action that the majority of respondents is aware of in all countries and the control group is that of switching off lights in empty rooms. The action that students are least aware of is that of using the microwave oven rather than the cooker. From the six behaviours targeted by the project the least know in all countries and the treatment group is that of putting a lid on the pans when cooking. In the control group it is that of putting on an extra layer instead of turning on the heating.

Habits and Practices

The energy saving actions with the highest habit strength are those of switching off lights and opening windows for cooling. The action performed least often is that of putting a lid on pans when cooking (Cyprus and the UK), boiling the right amount of water in the kettle (Greece), and avoiding leaving equipment on stand-by (Sweden and control group).

Between the treatment and the control group no statistically significant differences are found in the frequency that a lid is put on pans when cooking, the right amount of water is boiled with the kettle and an extra layer is applied instead of the heating. Some differences are found however, in the frequency that lights are switched off, that windows are opened as a mean of cooling and that electronic equipment are left on stand-by.

Behavioural Antecedents

13 items from 9 variables of behaviour change theory and models capable of inducing behaviour change were selected from the Norm Activation Model (NAM), the Theory of planned behaviour (TPB) and the Triandis' Theory of Interpersonal Behaviour (TIB) have been selected (see Appendix B).
Analysis of the entire population of respondents reveals a positive attitude towards energy saving and a strong feeling that others do not expect from respondents to use less energy. Also a high level of ascription of responsibility but also a high level of awareness of the impacts of energy consumption on the environment is also observed.

Statistically significant differences are 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, subjective norms, emotions, role beliefs and intention.

Between the treatment and control group significant differences are found in personal norms, on the attitude that saving energy being too much of a hassle, perceived behavioural control, emotions, role beliefs and intention. No significant differences were found in ascription of responsibility, awareness of consequences, the attitude that saving energy means that they have to live less comfortably and subjective norms.

Opportunities for Energy Saving

The most important reasons for being more energy conscious are: "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 are 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 for being less energy conscious are: 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 are 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.

1. Introduction

475 dormitories managed by 17 different university housing providers, housing 24,976 students in five countries over the academic years 2014/15 and 2015/16 (49,952 students in total over 2 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). D3.2 presents an overview of the Student Switch Off evaluation methodology and the findings of the baseline energy and baseline questionnaire survey analysis. The main evaluation period for this report is academic year 2014-2015.

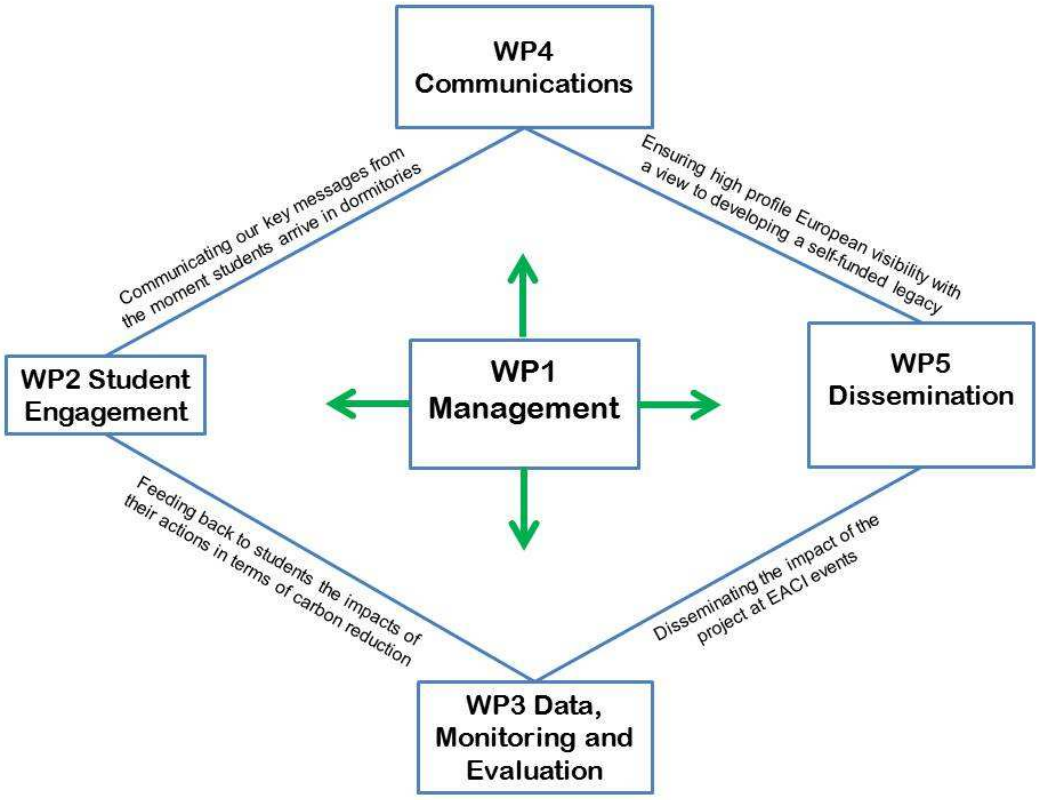

Figure 1: overview of the SAVES project

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

- 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

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

- 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. 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. We anticipate for future reports that the new energy dashboard will automatically generate the savings.

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 (Sept 2014; Sept 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.

---

[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)

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 5 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 5 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 12 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 C). 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 was 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 competition 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

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

Lifestyle
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. Three items measure the current energy related lifestyle and intention to change it when moving into private accommodation.

- *Current lifestyle and energy saving*

The item was measured on a 6-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 4-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'.

- *Future lifestyle and energy saving*

[4] www.surveymonkey.com

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'.

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) level of 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 5-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 B). 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.
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").

- *Ascription of Responsibility (AR)*

Ascription of responsibility reflects the feelings of responsibility for the negative consequences of not engaging with the behaviour in question.
One item was used to measure ascription of responsibility ("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 one 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.
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").

- *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 two items: 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").

---

[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.

- *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.

- *Emotions (EMO)*

Emotional reactions towards a given behaviour are considered capable of changing that behaviour.
Emotions were measured through one 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 one item ("As a resident of the dorms I should be more concerned about my energy use during my stay there").

- *Intention (INT)*

Intentions are considered immediate antecedents of behaviour.
Intention was measured through one item ("I intend to try harder to reduce my energy use this academic year").

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 6 target behaviours is undertaken was measured on a 5-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 are measured through the following questions:

- Incentives

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

2.2.6 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 will be 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 will include a methodology for the establishment of a baseline at each dormitory and a common approach for calculating and reporting savings.

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

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 will be provided at the beginning of each academic year and will be followed by savings reports at the end of each academic year.

The proposed methodology is expected to include the following elements:

- kWh electricity consumption data will be 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, the pre-intervention data already collected will form the baseline
- 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 comparisons/competition to be updated in real-time and will be present in all dormitories for the 2015/16 academic year
- 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.

Propensity score matching will be used on the data from the follow-up survey at the end of the academic year to help match the treatment group with the control group. Matching with the control group will be based on a number of characteristics that are known or believed to influence program outcomes (demographics, socio-psychological variables etc).

3. Energy Data Analysis

This section provides the baseline energy use for each of the dormitories, including the control group in Linkoping, Sweden. A 'headline' chart is included for each dormitory provider. A more detailed analysis of each dorm provider and how the adjusted baseline has been calculated can be provided on request.

For each dormitory a common approach has been made, as outlined in section 2.2.6, however due to variances in the availability of historical data across the different dormitory providers specific assumptions have been made where either obtaining the data has been a challenge, or there are a specific set of circumstances worthy of note.

These assumptions are categorised as follows:

- Missing data
- Occupancy
- Degree days
- Infrastructure
- Other

For example, the impact and role of degree day analysis in order to take account the impact of weather on the baselines. Certain dormitory providers, notably those in hotter climates have electrically cooled halls which will impact on the consumption. For each dormitory provider the headline figures are presented along with the particular challenges faced by each site, and the assumptions made to adjust for each situation. Where no assumptions have been necessary this is clearly noted. At the end of the academic years 2014/15 and 2015/16 the baseline data will be compared to actual usage in 2014/15 and 2015/16 to calculate whether savings have been made.

The list of dormitory providers is as follows and data will be outlined country by country.

Table 1 List of dormitory providers

Dormitory provider	Responsible partner (via Work Package 2)	Country	Dormitories	Students
University of Cyprus	UCY	Cyprus	12	208
National and Kapodistrian University of Athens	UoA	Greece	4	1,064
Technical University of Crete	UoA	Greece	1	78
Vilnius Co-operative College	VGTU	Lithuania	1	182
Vilnius Gediminas Technical University	VGTU	Lithuania	4	2,400
Vilnius College of Technology and Design	VGTU	Lithuania	4	1,212
Vilnius University	VGTU	Lithuania	3	2,270
Klaipeda State College	VGTU	Lithuania	5	1,028
SGS Studentbostäder, Olofshöjd, Göteborg	SBF	Sweden	70	1,589
Stiftelsen Stockholms Studentbostäder	SBF	Sweden	250	1,582
University of Bath	NUS-UK	UK	38	3,402
Cranfield University	NUS-UK	UK	5	947
De Montfort University	NUS-UK	UK	5	1,984
The University of Northampton	NUS-UK	UK	7	1,640
Queen Mary, University of London	NUS-UK	UK	20	2,237
University of West of England	NUS-UK	UK	27	2,111
University of Worcester	NUS-UK	UK	18	1,042
		TOTAL	475	24,976

3.1 Cyprus

3.1.1 University of Cyprus

				ADJUSTED BASELINE									
Dorm name	Student no.s	trically heated (Y	Electrically cooled (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Building 01	32	No (See Note 1 bel	No	2644	2756	2,412	2,285	1,823	2,102	2,239	1,937	2,263
Building 02	24	No (See Note 1 bel	No	2569	3974	(0.2833x + 107.95)*30	4,726	4,045	(0.3221x + 101.76)*28	(0.3221x + 101.76)*31	3,938	3,926
Building 03	24	No (See Note 1 bel	No	1947	2671	(0.1206x + 80.888)*30	3,188	2,595	(0.1483x + 76.461)*28	(0.1483x + 76.461)*31	2,587	2,718
Building 04	24	No (See Note 1 bel	No	2271	3961	(0.0623x + 121.31)*30	4,216	3,645	(0.0997x + 115.32)*28	(0.0997x + 115.32)*31	3,137	3,906
Building 05	40	No (See Note 1 bel	No	3715	5968	(0.1209x + 197.13)*30	6,929	6,363	(0.1209x+197.13)*28	(0.1209x+197.13)*31	5,515	5,083
Building 06	12	No (See Note 1 bel	Yes	0.1464x + 68.745	0.1464x + 68.745	(0.0488x + 53.186)*30	1,859	1,514	(0.066x+50.431)*28	(0.066x+50.431)*31	1,490	1,628
Building 07	12	No (See Note 1 bel	Yes	0.1064x + 78.23	0.1064x + 78.23	(0.1994x + 58.78)*30	2,797	2,488	(0.2208x+55.36)*28	(0.2208x+55.36)*31	2,332	2,372
Building 08	12	No (See Note 1 bel	Yes	3,209	3458	(0.2031x + 61.897)*30	2,937	2,362	(0.2269x+58.091)*28	(0.2269x+58.091)*31	2,577	2,530
Building 09	12	No (See Note 1 bel	Yes	2,000	2617	(0.2197x + 59.24)*30	2,860	2,765	(0.2197x+59.24)*28	(0.2197x+59.24)*31	2,527	2,655
Buildings 10, 11, 12	16	No (See Note 1 bel	Yes	0.2041x + 48.391	0.2041x + 48.391	(0.2197x + 59.24)*30	1,890	1,615	(0.1173x + 45.98)*28	(0.1173x + 45.98)*31	1,453	1,524
Degree day data (if applicable) - if not put N/A			Heating Degree Day (Tb=21,5)									
			Heating Degree Day (Tb=23,5)									
				Oct		Nov	Dec	Jan	Feb	Mar	Apr	May
				Degree day data								

Assumptions:

Missing data	N/A
Occupancy	A range of assumptions have been made to reflect the range of partial occupancy, for example, in September, October, November, February, March the halls are 100% fully occupied whereas in Dec and Jan the halls are partly occupied due to Christmas break.
Degree Days	The December and January baseline is not adjusted for degree days, as there are only 2 data points to do a correlation. Hence as a result we compared raw December and January data.
Infrastructure	N/A
Other	• The heating source of the dorms is the district heating system (No electricity is used to generate heat). Electricity is though used to drive the pumps and circulators of the system therefore electricity is indirectly used for meeting the heating demand. • Electricity is used for water heating purposes as a secondary source. The primary source is solar water heaters coupled with the district system.

3.2 Greece

3.2.1 University of Athens

			ADJUSTED BASELINE								
Dorm name	Student no.s	Electrically heated (Y/N)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
A+B FEPA	836	Y	(338.07x + 84536)	(338.07x + 84536)	161310	(338.07x + 84536)	(338.07x + 84536)	(338.07x + 84536)	(338.07x + 84536)	123199	central heating system operated with gas BUT it is not used as frequently therefore students use their own personal electric heating devices in order to keep warm. Buildings A and B FEPA were on a common meter for the baseline year.
C FEPA	128	Y	(72.074x + 17423)	(72.074x + 17423)	37784	(72.074x + 17423)	(72.074x + 17423)	(72.074x + 17423)	(72.074x + 17423)	18857	central heating system operated with gas BUT it is not used as frequently therefore students use their own personal electric heating devices in order to keep warm.
D FEPA	100	Y	(47.732x + 14873)	(47.732x + 14873)	28857	(47.732x + 14873)	(47.732x + 14873)	(47.732x + 14873)	(47.732x + 14873)	15295	central heating system operated with gas BUT it is not used as frequently therefore students use their own personal electric heating devices in order to keep warm.
Degree day data (if applicable) - if not put N/A		Heating Degree Day (Tb=21,5)	88	163	345	282	256	245	153	65	
		Heating Degree Day (Tb=22,5)	110	192	376	313	284	276	182	85	
		Cooling Degree Day (Tb=24)	6	0	0	0	0	0	1	14	
		Cooling Degree Day (Tb=22,5)	15	0	0	0	0	0	3	26	
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
			Degree day data								

Assumptions:

Missing data	N/A
Occupancy	In Sept-Dec 2013 occupancy was unusual as the university was closed because of industrial action - for the purposes of analysis, we are assuming 90% occupancy, so have added 10% to the baseline data for the months of October and November
Degree Days	• The dorms are normally heated by gas however due to the heating being switched off due to funding, many students have used personal heaters, thus increasing energy consumption, therefore we will be using heating degree day analysis for cold months. • December's figures are partial occupancy, so we have not applied heating degree day analysis • In May, no heating is used, so we have not applied degree days
Infrastructure	N/A
Other	N/A

3.2.2 Technical University of Crete

				ADJUSTED BASELINE									NOTES
				2013-2014									
University Name	Dorm name	Student no.s	Electrically heated (Y/N)	Sep	Oct	Nov.	Dec	Jan	Feb	Mar	Apr	May	
TUC	H	78	N	10190,2	10182,9	15769,5	14378	25666,2	26606,9	28793	18949,2	8464	Oil - boiler centra heating system
Degree day data (if applicable) - if not put N/A			Heating Degree Day (Tb=21C)	7	80	125	282	250	232	238	143	77	
			Cooling Degree Day (Tb=26C)	23	2	0	0	0	0	0	2	6	
				Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
				Degree day data									

Missing data	Consumption data for the dormitory building did not exist for Sept 2013-April 2014. Real data measurements are recorded from April 2014. The estimation calculation for the months Sept 2013-April 2014 was based on assumptions on the daily use of lighting and electricity devices (Electrical equipment, Refrigerator, Kitchen, Washing machine, PC's) estimating the monthly consumption of each room and on the recorded oil consumption for heating.
Occupancy	N/A
Degree Days	N/A
Infrastructure	N/A
Other	N/A

				ADJUSTED BASELINE									NOTES
				2014-2015									
University Name	Dorm name	Student no.s	Electrically heated (Y/N)	Sep	Oct	Nov.	Dec	Jan	Feb	Mar	Apr	May	
TUC	H	78	Y	11640	12894,5	14149	12770	22848	24332	21987	13000	12145	The Technical University of Crete has installed since mid of August air conditioners in each dormitory room (78 in total), to serve the cooling as well the heating requirements of the building. One must notice that the previous heating system was via a central petroleum boiler which was considered very costly for the University.
Degree day data (if applicable) - if not put N/A			Heating Degree Day (Tb=21C)	5	69	137	225	310	293	246	170	66	
			Cooling Degree Day (Tb=26C)	34	3	0	0	0	0	0	1	6	
				Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
					Degree day data								

Assumptions:

Missing data	N/A
Occupancy	N/A
Degree Days	N/A
Infrastructure	N/A
Other	N/A

3.3 Lithuania

3.3.1 Vilnius Co-operative College

			ADJUSTED BASELINE										NOTES
Dorm name	Student no.s	Electrically heated (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	
dorm No. 1 (Lvovo g.38A)	182	N	9,400	8,700	11,120	12,220	11,530	12,460	9,850	10,410	8,240	7,120	multiple meters
Degree day data (if applicable) - if not put N/A		Heating Degree Day											
		Cooling Degree Day											

Assumptions:

Missing data	N/A
Occupancy	N/A
Degree Days	N/A
Infrastructure	The heating source for all of the dorms is the district heating system
Other	N/A

3.3.2 Vilnius Gediminas Technical University

			ADJUSTED BASELINE										NOTES
Dorm name	Student no.s	Electrically heated (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	March	Apr	May	June	
dorm No. 3 (Sauletekio al. 16)	500	N	25,601	45,023	35,050	48,586	47,904	43,792	53,900	25,499	15,160	11,511	multiple meters
dorm No. 4 (Sauletekio al. 18)	506	N	22,442	40,630	33,163	44,962	41,885	47,885	25,124	25,532	22,528	14,954	multiple meters
dorm No. 5 (Sauletekio al. 19)	653	N	37,195	62,376	53,164	64,447	57,540	53,277	49,008	45,504	37,835	26,663	multiple meters
dorm No. 1 (Sauletekio al. 25)	741	N	35,834	51,333	45,443	63,232	64,067	62,381	52,785	48,995	38,295	26,763	multiple meters
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	

Assumptions:

Missing data	N/A
Occupancy	N/A
Degree Days	N/A
Infrastructure	The heating source for all of the dorms is the district heating system
Other	N/A

3.3.3 Vilnius College of Technology and Design

			YEAR																NOTES
			2013				2014												
Dorm name	Student no.s	Electrically heated (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
Antakalnio g. 56, Dorm No.1	176	N	5459	8537	10066	2131	7259	7059	6438	4701	4799	4737	2819	3233	6300	6589	16319	4882	multiple meters
Antakalnio g. 52, Dorm No.2	155	N	5892	5711	8655	8260	6519	7467	5965	5405	4833	5021	3935	5103	4458	6079	8914	6669	multiple meters
P.Vileišio g. 20, Dorm No.3	269	N	7292	12017	15894	3634	8857	9583	10678	6194	7129	6884	3810	3924	6511	12469	20942	7201	multiple meters
Statybininkų g. 3, Dorm No.4	269	N	9630	20880	20550	3830	15750	15540	15330	8810	10640	9130	5810	6190	9980	17710	31660	11080	multiple meters
V. Grybo g. 39, Dorm No.5	343	N	17774	41293	46852	7056	25551	24581	28416	16384	18794	16816	15016	13760	19732	31117	36594	17057	multiple meters
Degree day data (if applicable) - if not put N/A		Heating Degree Day	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
		Cooling Degree Day	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
			Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
			Degree day data																

Assumptions:

Missing data	N/A
Occupancy	N/A
Degree Days	N/A
Infrastructure	The heating source for all of the dorms is the district heating system
Other	N/A

3.3.4 Vilnius University

			ADJUSTED BASELINE									
Dorm name	Student no.s	Electrically heated (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	March	Apr	May	June
dorm No. 1 (Sauletekio al. 4)		N	23,186	39,631	35,359	29,958	56,088	45,159	36,408	31,839	25,866	19,019
dorm No. 2 (Sauletekio al. 6)		N	22,178	42,649	34,348	35,682	54,849	43,412	35,079	30,298	25,252	19,246
dorm No. 3 (Sauletekio al. 8)		N	21,109	44,925	39,917	45,010	60,366	45,329	37,883	32,418	25,175	18,046
dorm No. 4 (Sauletekio al. 12)		N	22,993	39,488	32,675	43,469	55,720	44,914	39,147	32,603	26,470	20,360
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

Assumptions:

Missing data	N/A
Occupancy	N/A
Degree Days	N/A
Infrastructure	The heating source for all of the dorms is the district heating system
Other	N/A

3.3.5 Klaipeda State College

			YEAR													NOTES
			2013				2014									
Dorm name	Student no.s	Electrically heated (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
dorm No. 1 (Jaunystes g. 4)	314	N	10,854	15,818	16,191	12,509	19,491	21,214	14,346	12,477	12,914	11,202	9,215	9,415	13,530	multiple meters
dorm No. 2 (Taikos pr. 4)	312	N	6,476	11,950	13,197	14,254	16,520	18,607	12,517	10,493	10,110	8,726	5,877	5,147	8,300	multiple meters
dorm No. 3 (Gulbiu g. 8)	65	N	2,018	4,327	2,568	820	202	3,373	3,623	2,581	3,057	2,163	1,089	950	2,669	multiple meters
dorm No. 4 (Debreceno g. 25)	337	N	9,011	16,434	16,612	17,797	17,806	18,280	13,171	11,481	11,130	9,225	6,093	7,062	10,846	multiple meters
Degree day data (if applicable) - if not put N/A		Heating Degree Day	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
		Cooling Degree Day	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
			Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
			Degree day data													

Assumptions:

Missing data	N/A
Occupancy	N/A
Degree Days	N/A
Infrastructure	The heating source for all of the dorms is the district heating system
Other	N/A

3.4 Sweden

3.4.1 Stockholm (SSSB)

			ADJUSTED BASELINE							
Dorm name	Student no.s	Electrically heated (Y/N)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Kungshamra 1	12		1,503	1,624	1,237	1,435	539	13	12	13
Kungshamra 2	12		1,251	1,276	1,226	1,356	1,261	1,053	752	868
Kungshamra 3	12		2,061	2,255	2,493	1,919	835	28	27	28
Kungshamra 4	12		805	781	707	804	679	905	713	676
Kungshamra 5	12		1,024	1,365	1,272	1,317	589	22	22	22
Kungshamra 6	12		1,180	1,474	1,005	1,030	960	1,019	908	949
Kungshamra 7	12		1,113	1,419	1,459	1,360	565	22	22	22
Kungshamra 8	12		3,686	3,591	3,481	3,507	3,227	3,758	3,623	3,756
Kungshamra 9	12		1,003	1,878	1,842	1,992	1,799	1,911	1,702	1,404
Kungshamra 10	12		1,031	1,069	1,391	1,569	1,084	743	809	865
Kungshamra 11	12		614	731	652	676	684	798	723	785
Kungshamra 12	12		1,281	1,310	1,191	1,124	951	740	864	738
Kungshamra 13	12		1,397	1,553	1,455	1,546	1,196	1,137	966	936
Kungshamra 14	12		1,109	1,498	1,558	1,239	1,011	1,056	979	960
Kungshamra 15	12		1,035	1,400	1,318	1,466	1,094	606	773	699
Kungshamra 16	12		972	918	940	1,061	1,306	974	973	1,068
Kungshamra 17	12		1,405	1,565	1,369	1,716	1,614	1,647	1,025	873
Kungshamra 18	12		997	1,170	1,590	1,928	1,227	1,665	1,350	1,383
Kungshamra 19	12		751	1,125	1,202	1,419	1,179	1,198	972	896
Kungshamra 20	12		1,018	1,313	943	1,121	1,025	1,195	836	703
Kungshamra 21	12		1,367	1,236	1,088	905	1,266	934	784	794
Kungshamra 22	12		1,296	1,463	992	1,128	1,281	998	933	675
Kungshamra 23	12		1,437	2,058	2,217	2,241	1,566	1,337	942	713
Kungshamra 24	12		1,835	2,170	2,027	2,303	1,626	1,782	1,335	919
Kungshamra 25	12		389	376	389	389	207	-	-	-
Kungshamra 26	12		1,041	1,006	1,041	1,041	1,042	1,123	1,237	981
Kungshamra 27	12		526	508	526	526	280	-	-	-
Kungshamra 28	12		1,281	1,238	1,281	1,281	1,276	1,047	903	870
Kungshamra 29	12		452	437	452	452	241	-	-	-
Kungshamra 30	12		1,031	996	1,031	1,031	981	1,342	958	747
Kungshamra 31	12		1,374	1,328	1,374	1,374	1,300	1,274	708	663
Kungshamra 32	12		2,623	2,535	2,623	2,623	1,894	1,137	864	775
Kungshamra 33	12		1,179	1,126	1,202	1,003	826	948	989	1,025
Kungshamra 34	12		955	1,225	1,257	1,287	1,080	1,164	1,055	1,022
Kungshamra 35	12		1,210	1,169	1,221	1,220	1,321	1,292	1,038	1,076
Kungshamra 36	12		831	873	827	1,039	917	1,012	751	831
Kungshamra 37	12		1,533	1,623	1,072	1,010	1,200	1,209	880	960
Kungshamra 38	12		1,574	1,934	1,224	1,609	1,472	1,466	1,174	1,071
Kungshamra 39	12		801	897	1,068	1,158	917	791	758	795
Kungshamra 40	12		3,785	3,995	2,854	1,526	1,262	1,115	922	933
Kungshamra 41	12		1,424	1,387	1,435	1,435	1,291	1,668	1,672	1,370
Kungshamra 42	12		1,540	1,508	1,560	1,560	1,404	1,557	1,398	1,029
Kungshamra 43	12		1,519	1,458	1,509	1,509	1,358	1,368	949	1,012
Kungshamra 44	12		1,266	1,244	1,287	1,287	1,158	1,047	916	833
Kungshamra 45	12		1,069	1,060	1,097	1,097	987	1,287	1,162	1,093
Kungshamra 46	12		1,565	1,514	1,566	1,566	1,410	1,268	762	727
Kungshamra 47	12		1,816	1,783	1,845	1,845	1,660	1,281	850	978
Kungshamra 48	12		3,553	3,464	3,584	3,584	3,225	3,571	3,331	3,496
Lappis 1	50		0	-	-	-	-	-	-	-
Lappis 2	30		0	-	-	-	-	-	-	-
Lappis 3	30		0	-	-	-	-	-	-	-
Lappis 4	36		0	-	-	-	-	-	-	-
Lappis 5	39		0	-	-	-	-	-	-	-
Lappis 6	36		0	-	-	-	-	-	-	-
Lappis 7	44		0	-	-	-	-	-	-	-
Lappis 8	44		0	-	-	-	-	-	-	-
Lappis 9	44		0	-	-	-	-	-	-	-
Lappis 10	26		0	-	-	-	-	-	-	-
Lappis 11	26		0	-	-	-	-	-	-	-
Lappis 12	40		0	-	-	-	-	-	-	-
Lappis 13	33		0	-	-	-	-	-	-	-
Lappis 14	27		0	-	-	-	-	-	-	-
Lappis 15	26		0	-	-	-	-	-	-	-
Lappis 16	41		0	-	-	-	-	-	-	-
Pax 1	20		1,721	2,019	2,047	2,478	2,164	1,500	1,450	1,500
Pax 2	20		1,651	2,053	2,026	1,768	1,281	1,107	1,070	1,107
Pax 3	20		1,300	1,353	1,432	1,450	1,232	1,040	1,005	1,040
Pax 4	20		1,088	1,007	1,097	1,272	1,072	1,140	1,102	1,140
Pax 5	20		1,945	1,803	1,966	2,406	2,096	1,423	1,376	1,423
Pax 6	20		1,387	1,374	1,483	1,326	1,262	1,214	1,174	1,214
Pax 7	20		1,226	1,363	1,261	1,628	1,192	923	893	923
Pax 8	20		2,111	1,983	2,003	2,065	1,841	1,478	1,428	1,478
Pax 9	20		1,679	1,427	1,805	2,040	1,794	1,510	1,459	1,510
Pax 10	20		1,271	1,348	1,371	1,521	1,268	981	948	981
Pax 11	20		986	982	981	1,062	1,066	983	950	983
Pax 12	20		1,687	2,044	2,221	2,258	2,006	1,237	1,196	1,237
Pax 13	20		1,602	1,619	1,891	1,907	1,494	1,256	1,214	1,256
Pax 14	20		1,368	1,269	1,330	1,419	1,304	1,273	1,231	1,273
Pax 15	20		1,014	949	909	1,070	854	762	737	762
Pax 16	20		1,329	1,528	1,620	2,140	2,116	1,440	1,392	1,440
Pax 17	20		2,751	2,743	2,984	3,273	2,510	1,866	1,804	1,866
Pax 18	20		1,904	1,893	1,907	1,975	1,751	1,146	1,108	1,146
Degree day data (if applicable) - if not put N/A		Heating Degree Day								
		Cooling Degree Day								
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May

Assumptions:

Missing data	Due to key missing data the baseline data for Lappis is extrapolated based on the proportion of energy used at the site as judged by the 2014 data.
Occupancy	N/A
Degree Days	N/A
Infrastructure	N/A
Other	N/A

3.4.2 Gothenburg (SGS)

				ADJUSTED BASELINE							
University Name	Dorm name	Student no.s	Electrically heated (Y/N)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Gotheburg	Uppstigen 110-118	49	N	5,311	5,613	5,487	5,894	5,581	5,710	4,829	4,635
	Uppstigen 120-124	37	N	4,011	4,239	4,144	4,450	4,214	4,312	3,646	3,500
	Uppstigen 126-128	26	N	2,818	2,979	2,912	3,127	2,961	3,030	2,562	2,459
	Uppstigen 140-148	33	N	3,577	3,780	3,696	3,969	3,759	3,846	3,252	3,122
	Framgången 226-228	26	N	2,818	2,979	2,912	3,127	2,961	3,030	2,562	2,459
	Framgången 230-232	24	N	2,602	2,749	2,688	2,887	2,734	2,797	2,365	2,270
	Framgången 234-236	18	N	1,951	2,062	2,016	2,165	2,050	2,098	1,774	1,703
	Framgången 238-240	18	N	1,951	2,062	2,016	2,165	2,050	2,098	1,774	1,703
	Framgången 242-244	24	N	2,602	2,749	2,688	2,887	2,734	2,797	2,365	2,270
	Framgången 246-248	26	N	2,818	2,979	2,912	3,127	2,961	3,030	2,562	2,459
	Motgången 328-330	20	N	2,168	2,291	2,240	2,406	2,278	2,331	1,971	1,892
	Motgången 332-334	18	N	1,951	2,062	2,016	2,165	2,050	2,098	1,774	1,703
	Motgången 344-346	10	N	1,084	1,146	1,120	1,203	1,139	1,165	986	946
	Motgången 348-352	20	N	2,168	2,291	2,240	2,406	2,278	2,331	1,971	1,892
	Motgången 354-356	12	N	1,301	1,375	1,344	1,443	1,367	1,398	1,183	1,135
	Motgången 358	12	N	1,301	1,375	1,344	1,443	1,367	1,398	1,183	1,135
	Motgången 360-362	12	N	1,301	1,375	1,344	1,443	1,367	1,398	1,183	1,135
	Omgången 402-408	22	N	2,385	2,520	2,464	2,646	2,506	2,564	2,168	2,081
	Omgången 426-428	10	N	1,084	1,146	1,120	1,203	1,139	1,165	986	946
	Omgången 430-432	10	N	1,084	1,146	1,120	1,203	1,139	1,165	986	946
	Omgången 462-464	18	N	1,951	2,062	2,016	2,165	2,050	2,098	1,774	1,703
	Omgången 466-470	28	N	3,035	3,208	3,136	3,368	3,189	3,263	2,759	2,649
Degree day data (if applicable) - if not put N/A			Heating Degree Day								
			Cooling Degree Day								
				Oct	Nov	Dec	Jan	Feb	Mar	Apr	May

Assumptions:

Missing data	The baseline data for Gothenburg is an estimation - the raw data contained some street lights and other building, but it was adjusted for this, and calculated for the different dormitories. For further details please refer to the historic data tab on the accompanying worksheet
Occupancy	N/A
Degree Days	N/A
Infrastructure	N/A
Other	N/A

3.5 UK

3.5.1 University of Bath

			ADJUSTED BASELINE							
Dorm name	Student no.s	Electrically heated (Y/N)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Brendon	126	N	12,010	11,701	9,247	10,879	10,515	11,883	10,130	10,886
Canal Wharf	21	N	4,313	4,768	5,115	4,988	4,514	4,369	3,599	3,602
Carpenter House	133	N	27,252	36,178	31,106	35,768	33,928	38,200	35,196	39,011
Clevelands Buildings	154	N	29,495	33,834	30,738	31,106	28,560	30,162	25,440	25,416
Conygre	85	N	8,215	8,594	6,511	7,633	8,756	8,882	6,702	7,664
Cotswold	84	N	9,442	9,525	6,470	8,088	8,814	9,440	6,876	8,126
Derhill	84	N	8,306	8,402	5,714	7,512	8,095	8,765	6,863	7,870
Eastwood 1-19	225	N	18,696	18,669	13,633	17,629	18,572	19,475	14,605	16,659
Eastwood 23-31	104	N	15,114	14,759	11,870	13,775	14,610	15,671	12,794	14,081
Eastwood 32-51	260	N	36,192	36,691	30,531	33,903	34,160	36,829	29,254	33,530
John Wood Building	61	N	11,102	11,953	10,275	11,578	11,678	12,786	10,014	11,029
John Wood Court KA	44	N	4,483	5,035	4,739	5,018	4,693	5,349	4,335	4,724
John Wood Court KB	18	N	1,117	1,188	1,176	1,163	1,104	1,238	1,118	1,141
John Wood Court KC	34	N	3,261	3,338	2,653	3,059	3,108	3,410	2,819	3,087
John Wood Court KD	35	N	3,054	3,352	2,571	2,912	2,858	3,252	2,504	2,666
John Wood Court KE	35	N	3,454	3,615	2,718	3,393	3,384	3,600	2,805	3,352
John Wood Court KF	35	N	3,499	4,454	3,976	4,406	3,991	4,274	3,018	3,295
lodge	14	N	2,047	2,736	1,840	2,212	1,530	1,566	1,165	1,399
Marlborough	164	N	22,992	23,247	17,430	20,400	22,391	23,248	17,649	20,070
Mendip	103	N	8,600	8,405	5,813	7,259	8,133	8,859	6,336	7,487
Norwood L5	28	N	0	-	-	-	-	-	-	-
Norwood L6	29	N	0	-	-	-	-	-	-	-
Norwood L7	29	N	0	-	-	-	-	-	-	-
Norwood L8	29	N	0	-	-	-	-	-	-	-
Norwood L9	29	N	0	-	-	-	-	-	-	-
Osborne House	35	N	4,680	3,056	3,816	4,946	4,676	4,958	3,806	3,858
Polden	125	N	21,832	21,793	19,696	22,301	21,586	22,875	19,694	20,305
Pulteney Court	133	N	18,800	18,530	17,643	19,052	17,742	19,452	17,132	18,788
Quantock	83	N	7,365	7,194	4,847	6,131	6,781	7,379	5,168	6,561
Quarry	103	N	9,204	8,884	5,902	7,815	8,553	9,243	6,406	8,283
Solsbury	302	N	34,963	35,117	24,647	30,155	32,847	34,954	26,005	30,433
Thornbank Gardens	217	N	19,106	20,483	20,265	22,381	20,246	21,962	18,603	18,829
Wolfson	105	N	12,643	12,309	8,766	11,311	11,350	10,609	7,331	9,938
Woodland Court A	23	N	2,749	2,663	1,880	2,122	2,146	2,106	1,671	1,929
Woodland Court B	135	N	11,241	10,766	7,534	9,244	10,094	10,278	8,018	8,940
Woodland Court C	52	N	6,431	7,115	5,889	7,278	7,012	6,968	5,313	5,612
Woodland Court D	121	N	9,615	8,630	5,741	6,981	8,064	8,154	5,990	7,151
Woodland Court E	23	N	2,037	1,985	1,489	1,804	1,933	2,005	1,451	1,481
Degree day data (if applicable) - if not put N/A		Heating Degree Day								
		Cooling Degree Day								

Assumptions:

Missing data	N/A
Occupancy	N/A
Degree Days	N/A
Infrastructure	N/A
Other	Historically Bath have run the competition comparing savings year, on year as opposed to the pre-intervention baseline. The data we have is 2013, so post intervention.

3.5.2 Cranfield University

				ADJUSTED BASELINE							
University Name	Dorm name	Student no.s	Electrically heated (Y/N)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Cranfield	Chilver	106	Y	76.124x + 10468	76.124x + 10468	76.124x + 10468	76.124x + 10468	76.124x + 10468	76.124x + 10468	76.124x + 10468	76.124x + 10468
	Fedden	75	N	11,295	11,240	11,041	11,593	9,583	10,609	11,127	11,155
	Lanchester	384	N	38,077	40,809	41,107	44,667	38,543	42,672	32,924	36,067
	Mitchell	132	N	41,008	39,687	38,279	41,058	40,131	34,387	38,214	40,700
	Stringfellow	250	N	47,378	50,601	43,420	50,186	41,966	46,464	34,356	36,380
				0	-	-					
Degree day data (if applicable) - if not put N/A			Heating Degree Day								
			Cooling Degree Day								
				Oct	Nov	Dec	Jan	Feb	Mar	Apr	May

Assumptions:

Missing data	• Stringfellow data is adjusted for 54 extra permanent students in block 1 assuming the building had an average of 27 students last year. • For Lanchester April 2012 data is used as the reading for 2011 was erroneous • The data for Mitchell is for 2011/12
Occupancy	N/A
Degree Days	Degree day analysis has been done for Chilver dorm as it is electrically heated.
Infrastructure	N/A
Other	N/A

3.5.3 De Montfort University

			ADJUSTED BASELINE								
Dorm name	Student no.s	Electrically heated (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
The Grange (UNITE)	220	Y		136.29x + 42929	136.29x + 42929	118.39x + 43064	118.39x + 43064	136.29x + 42929	118.39x + 43064	118.39x + 43064	136.29x + 42929
Bede Hall	232	Y		153.55x + 25287	153.55x + 25287	137.57x + 23927	137.57x + 23927	153.55x + 25287	137.57x + 23927	137.57x + 23927	153.55x + 25287
Newarke Point (UNITE)	653	Y		481.77x + 107962	481.77x + 107962	346.11x + 120042	346.11x + 120042	481.77x + 107962	346.11x + 120042	346.11x + 120042	481.77x + 107962
Filbert Village (UNITE)	664	Y		326.46x + 138803	326.46x + 138803	346.92x + 135626	346.92x + 135626	326.46x + 138803	346.92x + 135626	346.92x + 135626	326.46x + 138803
New Wharf	215	Y		160.43x + 13013	160.43x + 13013	137.41x + 28316	137.41x + 28316	160.43x + 13013	137.41x + 28316	137.41x + 28316	160.43x + 13013
		Heating Degree Day									
		Cooling Degree Day									
Degree day data (if applicable) - if not put N/A											

Assumptions:

Missing data	N/A
Occupancy	N/A
Degree Days	Degree day analysis has been done on all the dorms due to the being electrically heated.
Infrastructure	N/A
Other	N/A

3.5.4 The University of Northampton

			ADJUSTED BASELINE							
Dorm name	Student no.s	Electrically heated (Y/N)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Simon Senlis	311	N	31,103	31,647	24,806	29,803	30,356	34,080	19,778	27,711
Spencer Perceval	311	N	33,483	35,617	29,641	32,383	33,326	37,850	25,057	33,425
William Carey	311	N	32,678	33,987	28,942	33,093	33,829	37,220	24,495	30,529
John Clare A	46	N	6,558	7,187	6,913	7,178	6,553	6,964	5,823	5,718
John Clare B	41	N	5,812	5,851	5,099	5,231	5,299	5,813	4,201	4,821
Charles Bradlaugh C	41	N	4,316	5,140	4,722	5,571	5,474	5,682	3,551	4,476
Charles Bradlaugh D	41	N	5,500	5,906	5,139	5,908	5,968	6,373	4,659	6,139
Charles Bradlaugh E-L	70	N	7,003	7,011	7,595	10,116	12,644	13,333	10,891	10,817
Margaret Bondfield	220	N	27,398	28,216	25,004	27,014	28,234	29,491	22,114	26,838
Bassett Lowke	248	N	29,094	30,664	24,278	27,028	26,721	29,023	18,811	25,308
Degree day data (if applicable) - if not put N/A		Heating Degree Day								
		Cooling Degree Day								
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May

Assumptions:

Missing data	N/A
Occupancy	N/A
Degree Days	N/A
Infrastructure	N/A
Other	N?A

3.5.5 Queen Mary, University of London

		ADJUSTED BASELINE									
University Name	Dorm name	Sept	Oct	Nov	Dec	Jan	Feb	March	Apr	May	June
Queen Mary, University of	Maynard House (+ Chapman/Chesney Hse		137.78x + 13900	137.78x + 13901	116.83x + 17519	116.83x + 17519	137.78x + 13900	116.83x + 17518	116.83x + 17519	137.78x + 13900	
	Creed		54.297x + 13452	54.297x + 13452	59.097x + 11531	59.097x + 11531	54.297x + 13452	59.097x + 11531	59.097x + 11531	54.297x + 13452	
	Fielden		65.334x + 37224	65.334x + 37224	55.983x + 30632	55.983x + 30632	65.334x + 37224	55.983x + 30632	55.983x + 30632	65.334x + 37224	
	Varey (+ Lodge Hse/Selincourt)		154.25x + 14732	154.25x + 14732	121.2x + 18644	121.2x + 18644	154.25x + 14732	121.2x + 18644	121.2x + 18644	154.25x + 14732	
	Maurice (+Lynden House)		99.506x + 15053	99.506x + 15053	57.652x + 17705	57.652x + 17705	99.506x + 15053	57.652x + 17705	57.652x + 17705	99.506x + 15053	
	Pooley		111.3x + 45671	111.3x + 45671	136.09x + 31541	136.09x + 31541	111.3x + 45671	136.09x + 31541	136.09x + 31541	111.3x + 45671	
	France		81.766x + 23139	81.766x + 23139	77.738x + 25093	77.738x + 25093	81.766x + 23139	77.738x + 25093	77.738x + 25093	81.766x + 23139	
	Ifor Evans		14,073	14,269	13,578	14,560	14,262	15,027	13,203	13,654	
	Floyer House		34,015	36,367	34,529	39,399	37,123	37,878	32,315	33,828	
	Beaumont		79.73x + 14935	79.73x + 14935	65.425x + 13216	65.425x + 13216	79.73x + 14935	65.425x + 13216	65.425x + 13216	79.73x + 14935	
	Stocks Court East		108.09x + 16930	108.09x + 16930	104.48x + 15261	104.48x + 15261	108.09x + 16930	104.48x + 15261	104.48x + 15261	108.09x + 16930	0
	Stock Court West Block		3,241	6,631	6,988	6,821	5,751	5,922	6,604	5,282	
	Dawson Hall		95,402	94,834	95,691	98,755	92,516	97,563	91,335	95,327	
	Lindop Hse		36.006x + 8283.9	36.006x + 8283.9	38.884x + 4627.2	38.884x + 4627.2	36.006x + 8283.9	38.884x + 4627.2	38.884x + 4627.2	36.006x + 8283.9	
	Hatton Hse		11,578	11,975	11,776	12,334	12,285	11,778	11,087	11,537	
	Albert Stern Hse		7,232	7,150	6,842	9,450	8,378	8,192	6,617	6,879	
Degree day data (if applicable) - if not put N/A											
		Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun

Assumptions:

Missing data	
Occupancy	N/A
Degree Days	Degree day analysis has been on electrically heated dorms
Infrastructure	N/A
Other	N/A

3.5.6 University of Warwick

			ADJUSTED BASELINE									
University Name	**Dorm name**	**Student no**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**March**	**Apr**	**May**	**June**
University of Warwick	Arthur Vick	396	28,548	28,548	51,468	51,468	51,468	45,590	45,590	45,590		
	Jack Martin	425	30,532	30,532	55,496	55,496	55,496	37,465	37,465	37,465		
	Tocil	574	37,750	37,750	78,325	78,325	78,325	41,782	41,782	41,782		
	Whitefields	195	11,741	11,741	15,357	15,357	15,357	13,191	13,191	13,191		
	International House	51	3,464	3,464	4,373	4,373	4,373	4,702	4,702	4,702		
	Rootes	872	71,980	71,980	85,827	85,827	85,827	102,417	102,417	102,417		
	Westwood	440	27,607	27,607	57,351	57,351	57,351	61,972	61,972	61,972		
	Claycroft	679	50,092	50,092	106,533	106,533	106,533	85,319	85,319	85,319		
	Redfern	214	7,634	7,634	23,021	23,021	23,021	24,604	24,604	24,604		
	Cryfield	258	25,583	25,583	24,660	24,660	24,660	23,194	23,194	23,194		
	Lakeside	596	45,847	45,847	64,298	64,298	64,298	61,356	61,356	61,356		
	Bluebell	505	52,032	52,032	85,238	85,238	85,238	65,428	65,428	65,428		
	Sherbourne	527	21,650	21,650	76,606	76,606	76,606	58,337	58,337	58,337		
Degree day data (if applicable) - if not put N/A												
			Sept	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**

Assumptions:

Missing data	N/A
Occupancy	N/A
Degree Days	N/A
Infrastructure	N/A
Other	Baseline of each hall from Oct-Dec 2014/15 is scaled up/down to factor in the savings/increases between 2011/12 and 2014/15 There appears to have been a significant change in Tocil between 2011/12 and 2014/15 so in this case the 2014/15 baseline is used rather than the scaled down 2011/12 baseline It should be noted that all baselines used are post-intervention so these values constitute a saving on the saving achieved from 2007/08 to 2011/12

3.5.7 University of Worcester

				ADJUSTED BASELINE								
University Name	Dorm name	Student no.s	Electrically heated (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
University of Worcester	Abberley	24	N	0	1531	1530	1080	1588	1365	2683	1325	1268
	AE Housmann	91	N	9210	12948	12272	9091	11732	12183	12907	9082	10948
	Ankerdine	36	N	0	2518	2590	1908	2415	2477	2578	1892	1927
	Avon	92	N	0	0	0	0	0	0	0	0	3879
	Berrow	36	N	1945	2953	2878	2178	2727	2773	3070	2394	2632
	Bishop Bosel	102	N	13592	17868	17742	14767	17991	17621	19007	14873	16171
	Chancellor	74	N	12129	15379	14752	11618	13940	14063	15135	12344	13540
	EBB	91	N	9927	13312	11971	9197	10832	11972	12909	10658	11804
	Evesham	31	N	1271	1543	2152	1736	1957	2035	2129	1406	1667
	Ledbury	102	N	0	0	0	0	0	0	0	0	9132
	Malvern	32	N	0	2755	2652	1890	2545	2611	2758	1891	2209
	Pershore	31	N	3105	2046	2723	2446	2690	2588	2674	1937	1908
	Sarah Siddons	36	N	0	1138	1241	912	1188	1134	1193	910	928
	Teme	24	N	2061	2933	3097	2264	3055	3428	3616	2517	2667
	Vesta Tilley	40	N	2665	3330	3321	2503	5454	4700	6769	5224	6068
	William Morris	40	N	1802	2167	2455	1702	2429	2173	2227	1569	1801
	Windrush	24	N	0	2036	2047	1575	1994	1965	2016	1435	1719
	Wulfstan	36	N	1557	2381	2340	1792	2265	2226	2955	1800	1931
Degree day data (if applicable) - if not put N/A			Heating Degree Day									
			Cooling Degree Day									

Assumptions:

Missing data	There is missing baseline data for a couple of dorms and these will not be taking part in the Student Switch Off competition
Occupancy	N/A
Degree Days	N/A
Infrastructure	N/A
Other	N/A

3.6 Control group – Linkoping, Sweden

				ADJUSTED BASELINE									
University Name	Dorm name	Student no.s	Electrically heated (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	March	Apr	May	June
Linköping University	Alsättersgatan 13-15	137	No	18,966	20,866	20,170	18,162	19,853	19,666	21,437	18,078	18,698	13,693
Linköping University	Björnkärrsgatan 8-10	136	No	19,903	22,311	22,244	19,701	21,143	20,413	21,719	19,260	20,234	14,537
Linköping University	Alsättersgatan 7-9	154	No	22,122	23,671	23,246	20,890	22,739	21,927	22,963	19,759	20,554	13,792
Linköping University	Alsättersgatan 5 &11	141	No	21,334	23,386	23,596	19,540	21,462	21,057	23,278	20,750	21,490	16,190
Linköping University	Björnkärrsgatan 4-6	156	No	19,604	21,883	21,370	18,917	21,045	20,313	21,132	18,949	20,243	14,029
Linköping University	Rydsvägen 246-250	254	No	43,677	47,754	46,630	44,130	46,320	44,226	48,389	43,611	44,701	33,158
Linköping University	Rydsvägen 252	84	No	11,482	12,765	12,486	11,673	13,179	12,857	13,505	11,606	11,526	8,978
Linköping University	Alsättersatan 1 / Rydsvägen 244	84	No	11,132	12,687	12,683	11,371	12,059	11,263	12,372	10,445	11,168	7,353
Linköping University	Alsättersgatan 3 / Rydsvägen 242	108	No	12,348	14,152	14,254	13,169	14,718	13,456	14,744	11,890	12,639	9,027
Linköping University	Rydsvägen 254-256	170	No	28,146	31,069	30,942	29,393	32,769	30,107	31,237	27,617	28,065	21,108
Linköping University	Rydsvägen 258-262	252	No	39,120	43,514	44,279	39,529	42,416	39,011	40,501	36,202	37,460	27,615
Linköping University	Västanågatan 18-28	258	No	37,960	43,387	42,563	37,225	41,917	42,252	43,854	37,235	39,720	24,482
Linköping University	Ryds Allé 1-21	467	No	68,869	77,782	76,177	67,680	73,386	71,347	75,937	66,869	69,362	50,523
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

Missing data	N/A
Occupancy	N/A
Degree Days	N/A
Infrastructure	N/A
Other	N/A

3.7 Conclusions

The approach to conducting the energy analysis has been presented. A 'bespoke' methodology had to be developed due to the challenge of inconsistent quality and in many cases, missing energy data across the dorm providers. This approach though has been tried and tested through many years of analysing data from Student Switch-Off competitions and is well proven. For each dorm provider a series of assumptions were applied, where relevant, to take into account a wide variety of expertise and installation with regards to energy data. At the end of the academic years 2014/15 and 2015/16 the baseline data will be compared to actual usage in 2014/15 and 2015/16 to calculate whether savings have been made. The control group's data will also be analysed and compared to its baseline. A more detailed analysis of each dorm provider and how the adjusted baseline can be provided on request.

4. Questionnaire analysis and results

4.1 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 Linkoping, Sweden.

A total of 4705 students had responded to the baseline questionnaire survey at the time that this analysis was performed. However, almost 700 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 71 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 3935 valid responses were collected (Table 2). Although the response rate in some countries has not been as high, still the 15% response rate target to the baseline questionnaire survey has been met.

Table 2 Survey response rate

	Cyprus	Greece	Lithuania	Sweden	UK	Sweden CG	Total
Students participating in SAVES (count)	208	1142	7173	3900	12089	2406	**26918**
Valid responces (count)	39	43	598	968	1308	979	**3935**
Response rate (%)	19%	4%	8%	25%	11%	41%	**15%**

Respondents live in dormitories in 5 different countries (

Table 3). Respondents from 17 dormitory providers took the survey. 7 of these are in the UK, 5 in Lithuania, 3 in Sweden, 2 in Greece, 1 in Cyprus. From the 3 Swedish dormitory providers, 2 will be implementing the Student Switch Off competition while 1 housing provider participates as provider of the control group.

Table 3 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 West of England

4.2 Results: Dormitories implementing the competition

4.2.1 Respondent characteristics

Overall, a good mix of male and female respondents (42%, for each) answered the questionnaire. 15% did not answer the question while 1% preferred not to say. Significant differences in gender exist across countries ($\chi^2(16)=82.055$, $p<.001$). The number of female respondents was higher than the number of male respondents in Cyprus, Greece, Lithuania and the UK. The largest percentage of female respondents is found in Cyprus (72% female) while the largest percentage of male respondents is found in Sweden (48% male).

Significant differences in the age of respondents is also found across countries ($\chi^2(28)=416.775$, $p<.001$). The biggest majority of respondents is between 17-24 years of age in all individual countries. In Sweden a large percentage of respondents (32%) is also between 24-35 years of age. 15% of total respondents did not answer the question on age.

The majority of respondents are native to the country they study in (54% of total). Across individual countries significant differences are found in the origin of the students studying there ($\chi^2(12)=462.299$, $p<.001$). In the UK, but especially in Sweden, students come from many parts of the world. On the other hand, in Lithuania and Greece students are only native. In Cyprus students are either native or from other EU countries. 15% of total number of respondents did not answer the question on citizenship.

Table 4 Respondent demographics

	Cyprus	Greece	Lithuania	Sweden	UK		Total
Gender							
Male	26%	37%	38%	48%	40%		**42%**
Female	72%	44%	43%	39%	43%		**42%**
Other	0%	0%	0%	0%	0%		**0%**
Prefer not to say	0%	2%	0%	3%	1%		**1%**
skipped question	3%	16%	19%	11%	17%		**15%**
Age							
<17 years	0%	0%	0%	0%	0%		**0%**
17-24	87%	70%	80%	56%	75%		**70%**
24-35	8%	14%	1%	32%	7%		**14%**
>=35	3%	0%	0%	1%	1%		**1%**
skipped question	3%	16%	19%	11%	17%		**15%**
Citizenship							
Native	64%	84%	81%	42%	49%		**54%**
EU citizen	33%	0%	0%	24%	15%		**15%**
non-EU citizen	0%	0%	0%	24%	20%		**17%**
skipped question	3%	16%	19%	11%	17%		**15%**
Year of study							
1st Year University	10%	7%	26%	15%	72%		**42%**
2nd Year University	10%	9%	34%	18%	2%		**14%**
>2nd Year University	54%	74%	35%	19%	4%		**17%**

PGr - Masters	21%	7%	5%	40%	18%		**22%**
PGr - Doctorate	5%	2%	0%	7%	2%		**3%**
Other	0%	0%	0%	1%	3%		**2%**
skipped question	0%	0%	0%	0%	0%		**0%**
Subject of studies							
Architecture / Engineering / Technology	15%	60%	41%	47%	28%		**37%**
Arts / Humanities	31%	16%	13%	8%	19%		**14%**
Health Sciences / Medicine	0%	5%	6%	14%	13%		**11%**
Mathematics / Physical Sciences	21%	14%	28%	11%	15%		**16%**
Social Sciences	33%	5%	12%	20%	26%		**21%**
skipped question	0%	0%	0%	0%	0%		**0%**

Overall, a good mix of students from different years and levels of education is found. All respondents answered the question. The majority of respondents are in their 1st year in university (42%) followed by students doing their masters (22%). 2% of respondents selected the "other" option. These students are mainly exchange students (Erasmus or international), top-up students or research associates and study in either Sweden or the UK. Significant differences in the level of studies of the respondents are observed across individual countries ($\chi^2(20)=1502.036$, $p<.001$). In Cyprus and Greece more than half of the students (54% and 74%, respectively) are in year 3 or higher of their undergraduate studies. The biggest majority of respondents (95%) from Lithuania are undergraduates. In Sweden a good mix between undergraduates and post-graduates is observed (52% and 47%, respectively). 72% of students in the UK are in their first year of studies and 18% are doing their masters.

Respondents study all main subjects of study, but subjects studied across countries vary significantly ($\chi^2(16)=275.952$, $p<.001$). Overall, the biggest percentage of respondents (37%) study architecture, engineering or technology. The second most represented subject of study (21% of respondents) is social sciences. The least represented subjects of study are those of health sciences and medicine and of arts and humanities (11% and 14% of respondents, respectively) followed by mathematics and physical sciences (16% of respondents). In Greece, Lithuania and Sweden the number of students studying architecture, engineering or technology and are assumed to have the best level of knowledge or awareness of energy saving issues is high (60% in Greece, 41% in Lithuania and 47% in Sweden). In Cyprus this number is rather low (15% of respondents). For the UK the percentage of respondents studying architecture, engineering or technology is 28%.

4.2.2 Lifestyle

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

4.2.2.1 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.

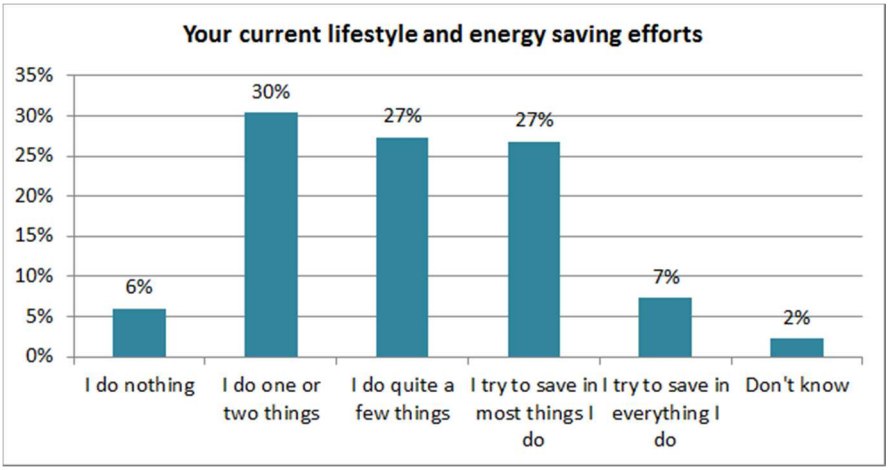

Figure 2 Energy saving efforts in current lifestyle (total sample)

Only 7% of all respondents think that they try to save energy in everything they do while another 6% that they do nothing to save energy. 30% claim to do one or two things in their everyday life to save energy and another 27% claim to do quite a few things or try to save energy in most things they do.

In individual countries the number of respondents that do nothing to save energy varies between 0% (for Cyprus) and 11% (for Lithuania). The percentage of respondents that try to save energy in most things or everything they do varies between 31% (Lithuania) and 72% (Cyprus) across countries. On the other hand, the biggest percentage of respondents that do one or two or quite a few things to save energy is found in the UK (61%) followed by Lithuania and Sweden (55% and 56%, respectively) and the lowest in Cyprus (28%).

Table 5 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%	15%	13%	51%	21%	0%
Greece	2%	23%	19%	37%	12%	7%
Lithuania	11%	28%	27%	23%	9%	4%
Sweden	5%	29%	27%	29%	8%	2%
UK	5%	33%	29%	26%	6%	2%

4.2.2.2 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 (45% of total) would like to do a bit more to save energy in their current lifestyle. 25% would like to do a lot more, while 27% are happy with what they do now.

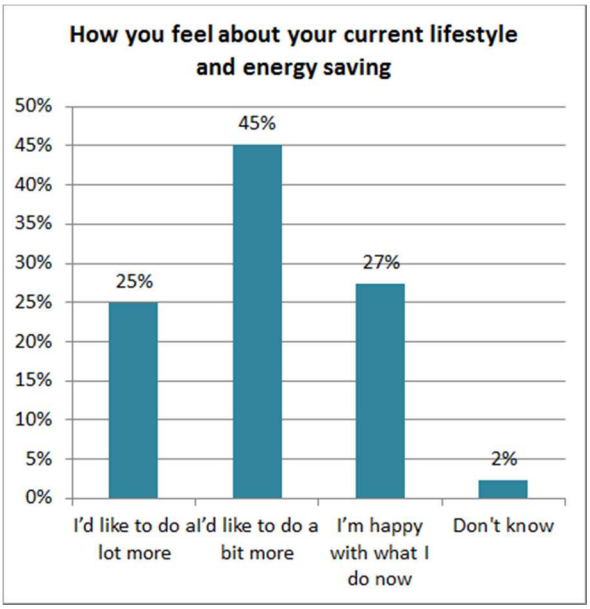

Figure 3 Opinion about energy saving efforts in current lifestyle (total sample)

At country level the percentage of respondents that are happy with what they do at the moment varies between 26% (Sweden) and 31% (Cyprus). The percentage of respondents that would like to do a bit more varies between 28% (for Greece) and 48% (for Sweden) across countries, while the number of those who would like to do a lot more varies between 21% (for Cyprus) and 42% (for Greece).

Table 6 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	21%	46%	31%	3%
Greece	42%	28%	28%	2%
Lithuania	32%	39%	27%	2%
Sweden	24%	48%	26%	2%
UK	22%	47%	28%	3%

4.2.2.3 Energy saving efforts in future lifestyle

Finally, respondents were asked to select the statement that best describes the way they think they will be living when they move out of the dormitories, in relation again to energy saving.

Only a marginal number of respondents (3% of total) think that they will be doing less than what they are currently doing in their dormitories. 35% of total number of respondents think that they will be doing about the same to save energy when they move out while 59% think that they will be doing a bit or a lot more.

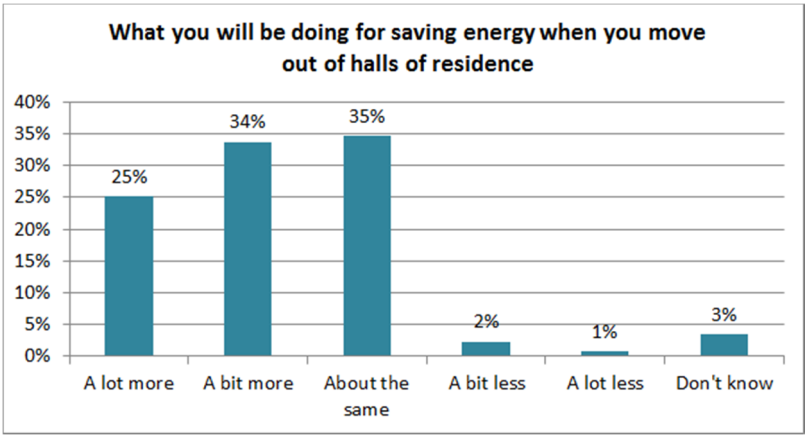

Figure 4 Energy saving efforts in future lifestyle (total sample)

At country level the number of respondents that will be doing a bit or a lot less to save energy when they move out of dormitories varies between 2% (Sweden) and 8% (Cyprus). 43% of respondents in Cyprus and only 16% in Lithuania think that they will be doing about the same to save energy. The percentage of respondents that think they will be doing a bit or a lot more to save energy varies between 47% (for Greece) and 80% (for Lithuania) across countries.

Table 7 Energy saving efforts in future lifestyle (per country)

	How do you think you will be living when you move out of halls of residence?					
	I think I'll be doing a lot more to save energy	**I think I'll be doing a bit more to save energy**	**I think I'll probably be doing about the same to save energy**	**I think I'll be doing a bit less to save energy**	**I think I'll be doing a lot less to save energy**	**Don't Know**
Cyprus	33%	26%	33%	3%	5%	0%
Greece	21%	26%	43%	5%	2%	2%
Lithuania	43%	37%	16%	2%	1%	2%
Sweden	21%	34%	39%	2%	0%	3%
UK	20%	33%	39%	3%	1%	4%

4.2.3 Knowledge

4.2.3.1 (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 exist across countries in both areas ($\chi^2(16)=341{,}062$, $p<.001$ for a) and ($\chi^2(16)=396{,}927$, $p<.001$ for b)). Nonetheless, in all countries the perceived level of information on what can be done at personal level to save energy is noticeably higher than the level of information on what is actually consumed.

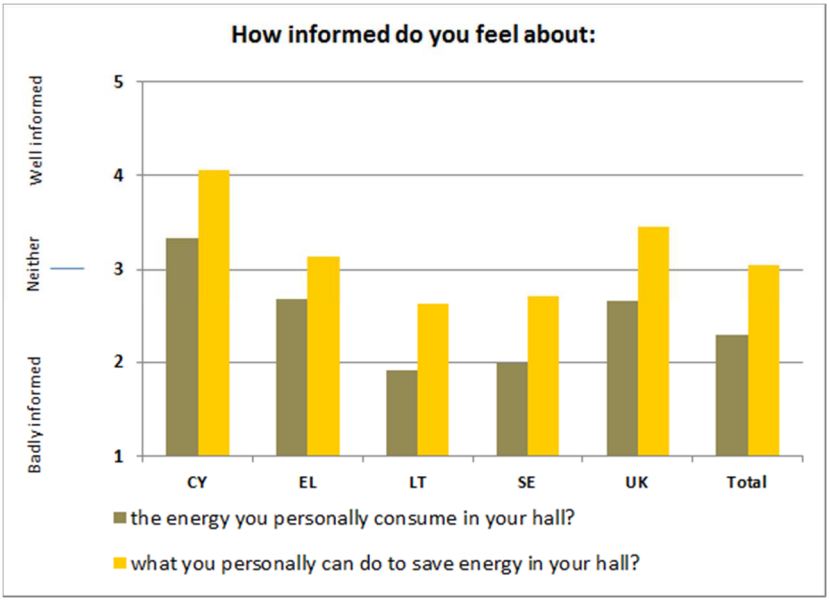

Figure 5 Mean values for perceived level of information on a) personal energy use and b) ways to save energy (total sample and per country)

Overall, respondents to the survey feel badly informed about their own energy consumption (overall mean value of 2.295). The highest level of information on own energy consumption is found in Cyprus (mean value of 3.333) and the lowest in Lithuania and Sweden (mean values of 1.914 and 1.985, respectively). On what can be done at personal level to save energy the overall level of information is closer to neutral (overall mean value of 3.041). The highest level of information on what can be done to save energy in dormitories is again found in Cyprus (mean value of 4.051) and the lowest in Lithuania and Sweden (mean values of 2.622 and 2.710, respectively).

Table 8 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?	3,33	1,084	2,69	1,297	1,91	1,018	1,99	1,085	2,66	1,094	2,29	1,140
b. what you personally can do to save energy in your hall?	4,05	,944	3,14	1,241	2,62	1,055	2,71	1,139	3,45	1,039	3,04	1,149

4.2.3.2 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 actually energy saving actions. The energy saving action that the majority of respondents is aware of (96% of total) is that of switching off lights in empty rooms. The action that students are least aware of (44% of total) is that of using the microwave oven rather than the cooker. From the six behaviours targeted by the project the least known is that of putting a lid on the pans when cooking (60% of total).

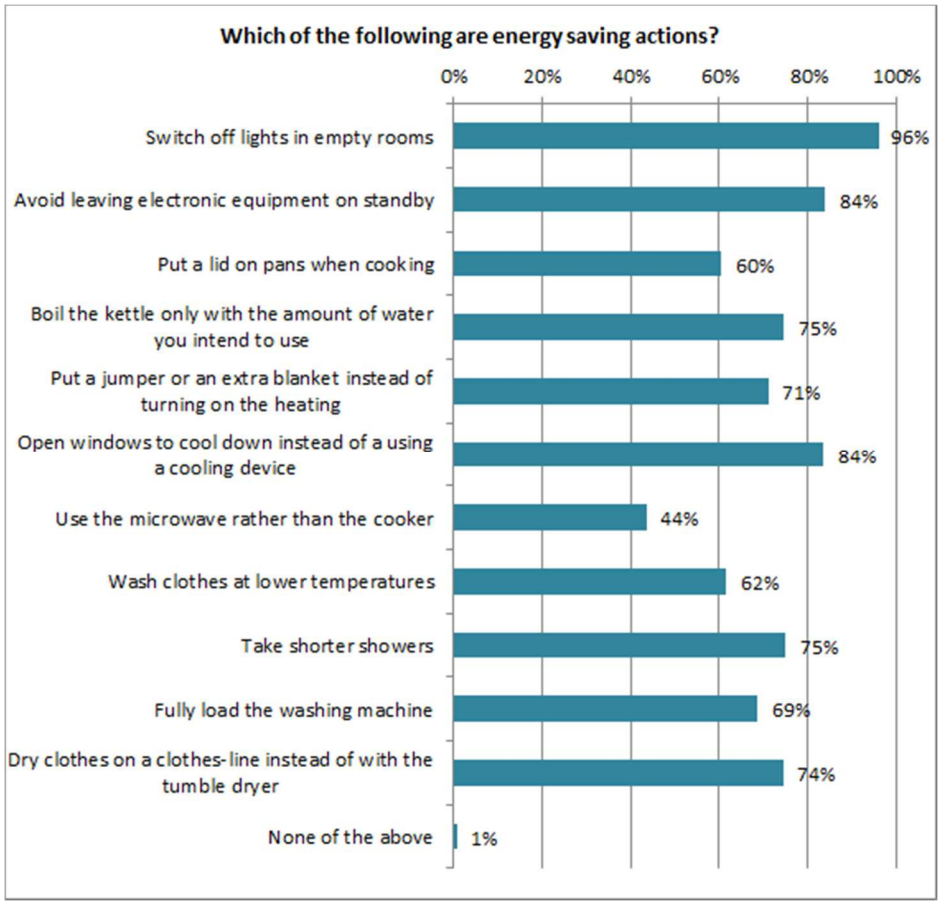

Figure 6 Awareness of energy saving actions (total sample)

Switching off lights is the most recognized energy saving action in all five countries. The least recognized action in all countries is again that of using the microwave oven rather than the cooker. From the six behaviours targeted by the project the least known in all countries is that of putting a lid on pans when cooking.

Table 9 Awareness of energy saving actions (per country)

Energy saving action	Cyprus	Greece	Lithuania	Sweden	UK
Switch off lights in empty rooms	100%	89%	98%	91%	99%
Avoid leaving electronic equipment on standby	85%	84%	76%	82%	89%
Put a lid on pans when cooking	56%	51%	56%	60%	63%
Boil the kettle only with the amount of water you intend to use	72%	68%	73%	71%	79%
Put a jumper or an extra blanket instead of turning on the heating	72%	68%	61%	62%	83%
Open windows to cool down instead of a using a cooling device	92%	78%	81%	76%	90%
Use the microwave rather than the cooker	44%	30%	29%	42%	52%
Wash clothes at lower temperatures	64%	68%	41%	57%	74%
Take shorter showers	85%	57%	62%	76%	80%
Fully load the washing machine	85%	78%	49%	68%	77%
Dry clothes on a clothes-line instead of with the tumble dryer	95%	81%	80%	63%	80%
None of the above	0%	0%	1%	1%	1%

4.2.4 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).

There are no statistically significant differences in the frequency that lights are switched off across countries[9] ($\chi^2(12)=12{,}130$, $p=.435$). Significant differences are found however, in the frequency that a lid is put on pans when cooking ($\chi^2(12)=68{,}422$, $p<.001$) and windows are opened as a mean of cooling ($\chi^2(12)=35{,}651$, $p<.001$). Some differences are also found across countries in the frequency that appliances are left in stand-by ($\chi^2(12)=25{,}610$, $p=.012$), the right amount of water is boiled with the kettle ($\chi^2(12)=28{,}402$, $p=.005$) and an extra layer is applied instead of the heating ($\chi^2(12)=31{,}532$, $p=.002$).

Overall, the energy saving actions performed more frequently are those of switching off lights (mean value of 4.50) and opening windows for cooling (mean value of 4.49). The action performed least often is that of putting a lid on pans when cooking (mean value of 3.42). This is in fact in line with the awareness of students about the various energy saving actions summarized in Figure 6.

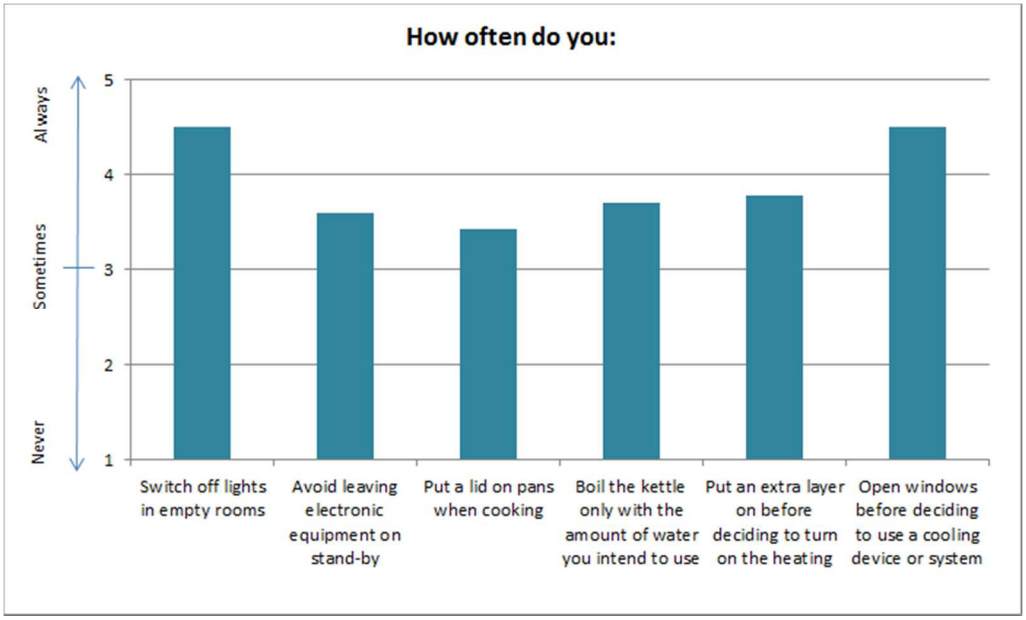

Figure 7 Mean values for frequency in which energy saving actions are performed (total sample)

At country level, switching off lights and opening windows for cooling are again the two actions performed more frequently. These actions have high habit strength in all countries as they are applied more than often (mean value > 4.00). Putting a lid on pans when cooking is the least applied energy saving action in Cyprus and the UK (mean values of 3.74 and 3.25, respectively). In Greece boiling the right amount of water in the kettle is the action applied less frequently (mean value of 3.41) and that of putting a lid of pans (mean value of 3.43). In Sweden, avoiding leaving equipment on stand-by is the action followed least often (mean value of 3.53).

Table 10 Mean values and standard deviations for the frequency in which energy saving actions are performed (per country)

[9] Note: This question was accidentally deleted from the Lithuanian version of the survey therefore no responses were available for this question for the case of Lithuania.

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**	4,61	4,00	3,74	3,89	3,97	4,13
	SD	,638	,959	1,057	1,110	1,052	,875
Greece	**M**	4,24	3,68	3,43	3,41	3,54	4,11
	SD	,895	1,156	1,237	1,301	1,070	,994
Sweden	**M**	4,48	3,53	3,63	3,80	3,66	4,54
	SD	,717	1,122	1,150	1,103	1,229	,823
UK	**M**	4,51	3,62	3,25	3,62	3,87	4,48
	SD	,668	1,042	1,155	1,151	1,088	,822

4.2.5 Behavioural antecedents

Overall, 13 items from 9 variables of behaviour change theory and models were measured with the survey. Items were evaluated on a 5-point Likert Scale (1= Strongly disagree, 5 = Strongly Agree) with higher values indicating a higher level of agreement with the statement.

The lowest agreement, at entire project level, was found with the two attitude items "Saving energy is too much of a hassle" and "Saving energy means I have to live less comfortably" (means values of 2.3 and 2.6, respectively) and with the injunctive item of subjective norms "Most people who are important to me think that I should use less energy" (mean value of 2.3). Low values for the two attitudes items indicate a more positive attitude towards energy saving. The low value for the injunctive item of subjective norms indicates a stronger feeling that others do not expect from respondents to use less energy.

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 value of 4.2, for each). 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.

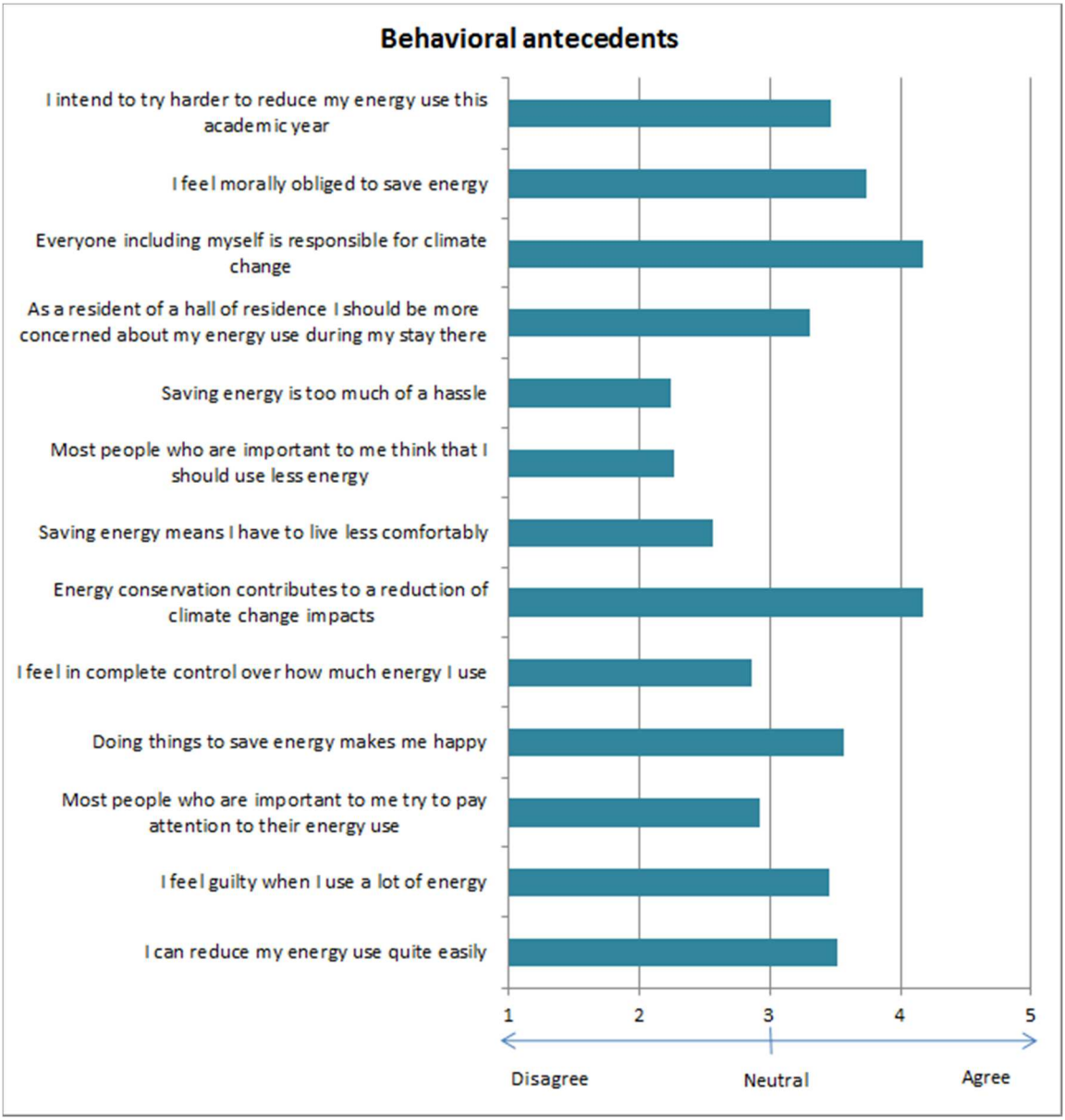

Figure 8 Mean values for behavioural antecedents (total sample)

Personal norms

Personal norms were measured with two items. The differences across countries are significant for both items (PN-1 ($\chi^2(16)=132.365$, $p<.001$); PN-2 ($\chi^2(12)=134.312$, $p<.001$)).

Overall, the feeling of moral obligation to save energy is rather strong (PN-1). Mean values range between 3.4 (in Lithuania) and 4.1 (in Cyprus).

Also, respondents in all countries, except for Lithuania where respondents are neutral (mean value of 3.0), seem to feel some small guilt when using a lot of energy (PN-2). Mean values in all other countries range between 3.1 (in Greece) and 3.6 (in Cyprus, Sweden and the UK).

Table 11 Mean values and standard deviations for personal norms items (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**
PN-1	I feel morally obliged to save energy	4,13	,978	3,76	,895	3,41	,961	3,90	,926	3,74	,914	3,74	,944

PN-2	I feel guilty when I use a lot of energy	3,59	1,069	3,11	1,048	3,03	1,041	3,58	1,050	3,56	1,038	3,46	1,065

Ascription of responsibility

Ascription of responsibility was measured with one item. Differences are significant across countries ($\chi^2(16)=99.866$, p<.001) but respondents in all countries seem to agree more rather than disagree that they are responsible for climate change.

Mean values across countries range between 3.6 (in Greece) and 4.4 (in Sweden).

Table 12 Mean values and standard deviations for ascription of responsibility item (total sample and per country)

		Cyprus		Greece		Lithuania		Sweden		UK		Total	
Acription of responsibility		**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
AR-2	I feel jointly responsible for climate change	4,15	,904	3,57	1,324	4,16	,922	4,36	,874	4,06	,945	4,17	,934

Awareness of consequences

Awareness of consequences was measured with one item. Differences are significant across countries ($\chi^2(16)=147.895$, p<.001).

Awareness of the consequences that energy consumption has on the climate is rather high in all countries as mean values range between 4.0 (in Lithuania) and 4.4 (in Cyprus and Sweden).

Table 13 Mean values and standard deviations for awareness of consequences item (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**
AC-1	Energy conservation contributes to a reduction of the climate change impacts	4,41	,715	4,08	1,187	3,99	,936	4,39	,815	4,07	,878	4,17	,887

Attitudes

Attitudes were measured through two items. The differences across countries are rather significant for both items (ATT-1 ($\chi^2(16)=37.268$, p=.002); ATT-2 ($\chi^2(16)=39.251$, p=.001).

Respondents seem to disagree, in some cases more in some cases less, that saving energy is too much of a hassle (ATT-1). Mean values range across countries between 1.8 (in Cyprus and Greece) and 2.3 (in Lithuania and the UK).

Respondents also tend to disagree rather than agree with the statement that saving energy means that they have to live less comfortably. Mean values range across countries between 2.2 (in Cyprus) and 2.7 (in Lithuania).

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

		Cyprus		Greece		Lithuania		Sweden		UK		Total	
Attitude		**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
ATT-1	Saving energy is too much of a hassle	1,77	,872	1,84	,866	2,30	,928	2,20	,907	2,29	,918	2,25	,919
ATT-2	Saving energy means I have to live less comfortably	2,23	1,012	2,35	1,006	2,75	1,058	2,52	1,016	2,53	,977	2,56	1,011

Perceived behavioural control

Perceived behavioural control was measured through two items: an item measuring self-efficacy (PBC-1) and an item measuring controllability (PBC-2). The differences across countries are significant for both items (PBC-1 (χ^2(16)=90.574, p<.001); PBC-2 (χ^2(16)=105.642, p<.001)).

Overall, the perception that personal energy use can be easily reduced is positive; in some countries more in some other countries less. Mean values across for self-efficacy (PBC-1) across countries range between 4.0 (in Cyprus) and 3.2 (for Greece).

On the other hand, the perception of control over how much energy is used (PBC-2) is lower in all countries compared to self-efficacy and is in some countries positive (Cyprus), in others negative (Greece, Lithuania, Sweden) and in others neutral (the UK). Mean values across countries range between 3.4 (in Cyprus) and 2.7 (in Sweden).

Table 15 Mean values and standard deviations for perceived behavioural control items (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**
PBC-1	I can reduce my energy use quite easily	4,03	,778	3,24	,983	3,47	,911	3,41	,954	3,61	,820	3,52	,894
PBC-2	I feel in complete control over how much energy I use	3,36	,986	2,76	,796	2,86	,970	2,69	1,055	2,99	,973	2,87	1,009

Subjective norms

Subjective norms were measured through two items: an injunctive item (SN-1) and a descriptive item (SN-2). The differences across countries are significant for both items (SN-1 (χ^2(16)=85.625, p<.001); SN-2 (χ^2(16)=254.594, p<.001)).

Overall, respondents don't perceive that saving energy is something that is expected from them (SN-1). Mean values across countries range between 2.1 (in Lithuania) and 2.4 (in Cyprus and the UK).
However, the perception that people who are important to the respondents try to pay attention to their own energy use (SN-2) is more positive than their perception of what is expected from them. Mean values across countries range between 2.4 (in Lithuania) and 3.6 (in Cyprus).

Table 16 Mean values and standard deviations for subjective norms items (total sample and per country)

		Cyprus		Greece		Lithuania		Sweden		UK		Total	
Subjective norm		**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
SN-1	Most people who are important to me think that I should use less energy	2,44	1,021	2,22	,947	2,19	,912	2,13	,966	2,40	,911	2,27	,941
SN-2	Most people who are important to me try to pay attention to their energy use	3,62	,877	2,76	1,065	2,40	,972	3,08	,921	3,03	,922	2,93	,971

Emotions

Emotions were measured with one item. Differences across countries are significant (χ^2(16)=81.521, p<.001).

Overall, saving energy seems to have some impact on emotions in all the countries as mean values range between 3.3 (in Lithuania) and 4.0 (in Cyprus).

Table 17 Mean values and standard deviations for emotion item (total sample and per country)

	Cyprus		Greece		Lithuania		Sweden		UK		Total	
Emotions	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**

EMO-1	Doing things to save energy makes me happy	4,00	,761	3,76	,863	3,34	,816	3,66	,910	3,57	,868	3,56	,880

Role beliefs

Role beliefs were measured through one item. Differences are found to be significant across countries ($\chi^2(16)=80.820$, $p<.001$).

Respondents tend 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 range between 3.3 (in Lithuania, Sweden and the UK) and 4.2 (in Cyprus).

Table 18 Mean values and standard deviations for role beliefs item (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**
ROL-1	As a resident of the dorms I should be more concerned about my energy use during my stay there	4,21	,833	3,51	1,044	3,26	1,000	3,27	,986	3,33	,928	3,31	,969

Intention

Finally, respondents were asked to indicate their intention to try harder to save energy over the next academic year through one item. Differences are significant across countries ($\chi^2(16)=101.541$, $p<.001$).

Mean values indicate more positive than negative intentions towards energy saving for the next academic year across all countries. The lowest mean value is found in Lithuania (mean value of 3.3) and the highest in Cyprus (mean value of 4.2).

Table 19 Mean values and standard deviations intentions item (total sample and per country)

		Cyprus		Greece		Lithuania		Sweden		UK		Total	
Intention		**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
INT-1	I intend to try harder to reduce my energy use this academic year	4,21	,695	3,41	,927	3,29	,913	3,40	,960	3,58	,852	3,47	,912

4.2.6 Opportunities for energy saving

4.2.6.1 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 is because it is a habit students adopted from home (73% of total). Other important reasons are because it saves energy (61% of total), it is the right thing to do (44% of total) and it helps reduce global warming (42% of total).

The least important reasons seem 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 (4% of total).

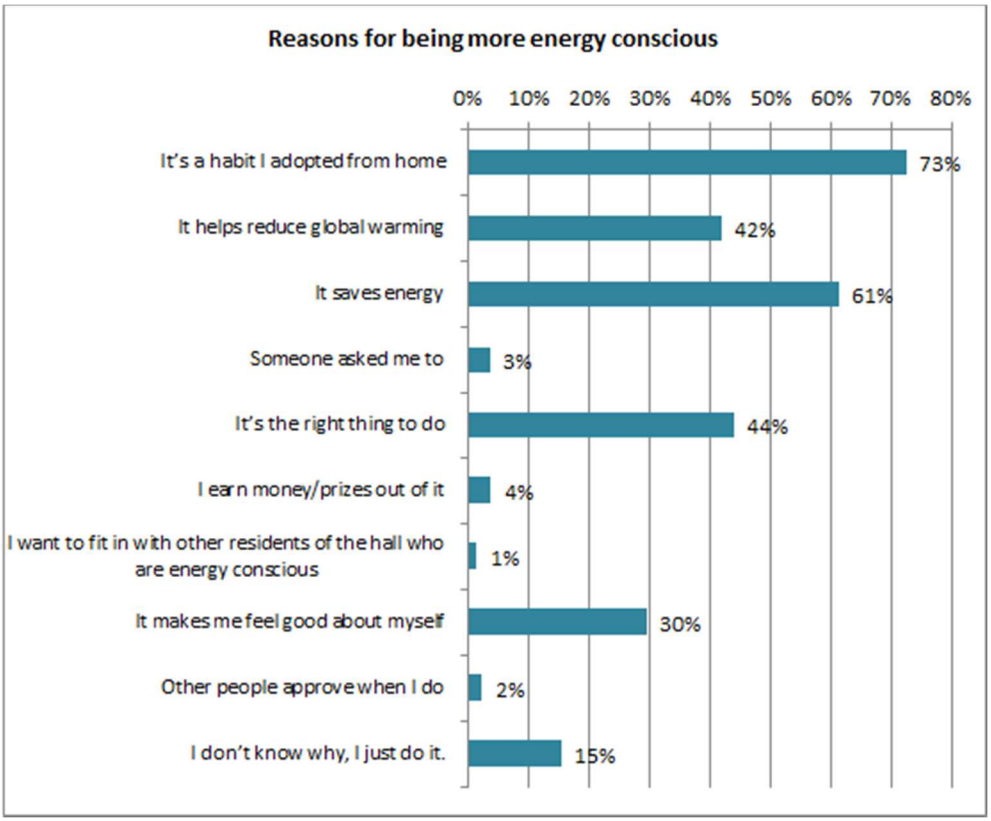

Figure 9 Reasons for being more energy conscious (total sample)

In Lithuania, Sweden and the UK, the three most important reasons are 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" with more than 60% of respondents selecting it as a reason in both countries.

The least important reasons are common for all countries and are 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 20 Reasons for being more energy conscious (per country)

Reason for being <u>more</u> energy conscious	**Cyprus**	**Greece**	**Lithuania**	**Sweden**	**UK**
It's a habit I adopted from home	71%	58%	74%	74%	72%
It helps reduce global warming	63%	36%	31%	43%	45%
It saves energy	66%	64%	58%	65%	60%
Someone asked me to	0%	0%	5%	2%	4%
It's the right thing to do	16%	11%	42%	44%	47%
I earn money/prizes out of it	0%	6%	3%	5%	3%
I want to fit in with other residents of the hall who are energy conscious	3%	3%	3%	1%	1%
It makes me feel good about myself	68%	61%	38%	29%	24%
Other people approve when I do	0%	0%	4%	1%	2%
I don't know why, I just do it.	5%	6%	18%	13%	17%

4.2.6.2 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 is the lack of feedback

on how much they consume (49% of total). Other important reasons are because the energy saved in the dormitories won't save students any money (37% of total), they have other things on their mind (25% of total) and limitations of the building's structure systems (24% of total). Another 24% of total number of respondents feel that nothing prevents them from being energy conscious.

The least important reasons for being less energy conscious are "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).

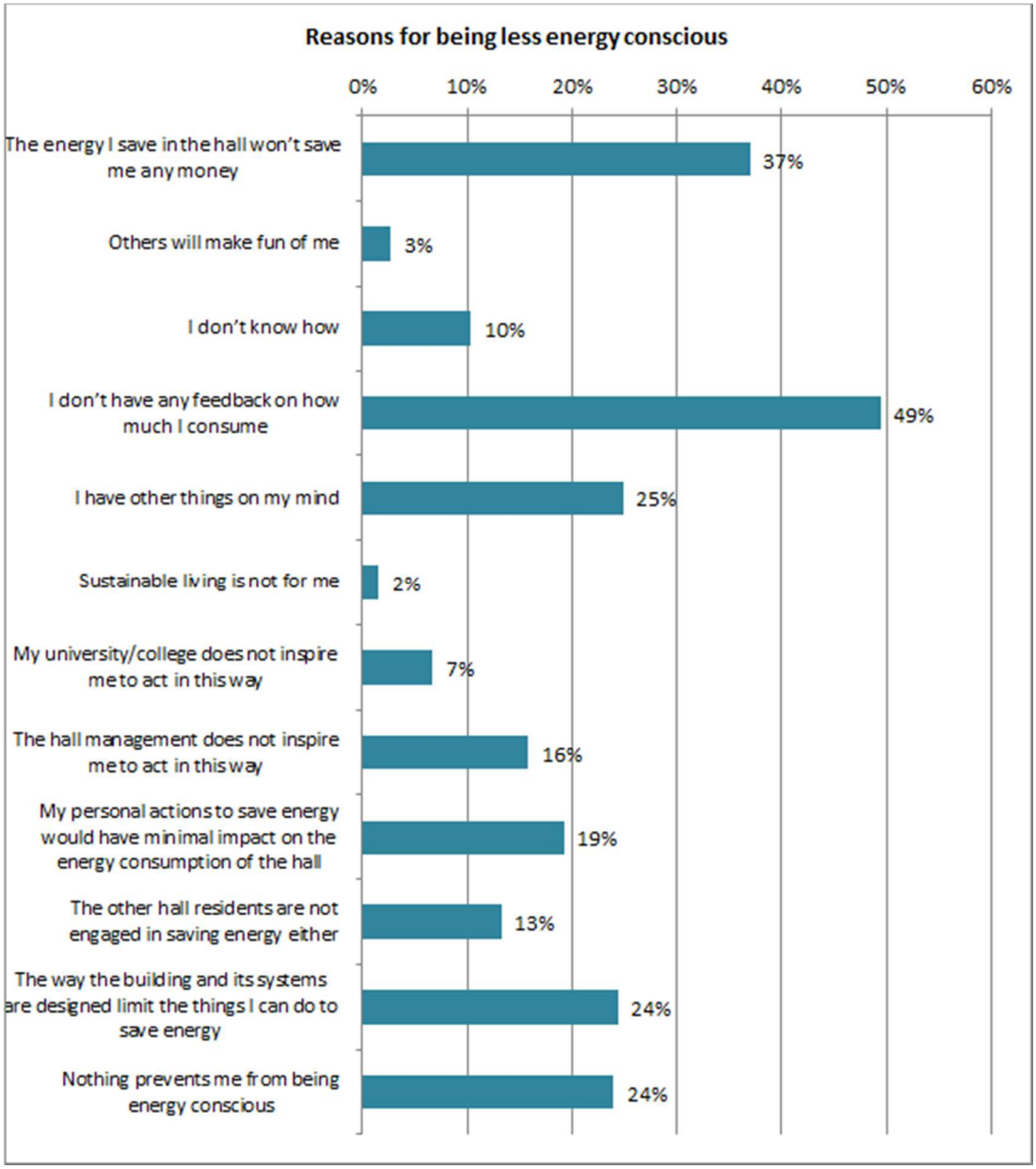

Figure 10 Reasons for being less energy conscious (total sample)

The ranking of reasons varies across countries. Only the lack of consumption feedback remains in the top three reasons in all countries.

In Cyprus 61% of respondents feel that nothing prevents them from being more energy conscious, while 21% of respondents feel that they are not as energy conscious because they either have other things on their mind or don't have feedback on how much they consume. None of the respondents fear of others making fun of them or are not inspired from the hall management, while only 5% feel that sustainable living is not for them.

In Greece 50% of respondents find it difficult to save energy due to limitations of the building and its systems, 36% are lacking feedback on how much they consume and 28% feel that their personal actions

would have minimal impact on the energy consumption of the dormitory. Another 28% of respondents in Greece feel that nothing prevents them from being more energy conscious. The three least important reasons for being less energy conscious are fear of being made fun of, other residents not engaging in energy saving, and sustainable living not being for them (each reason was selected by 3% of respondents).

In Lithuania the most important reasons for being less energy conscious are the fact that energy saving does not save them money (46% of respondents), lack of feedback on how much they consume (43%) and lack of inspiration from the hall management to act in this way (40%). The least important reasons are sustainable living not being for them (2% of respondents), not knowing how to save energy (3% of respondents) and fear of being made fun of (4% of respondents).

In Sweden, the most important reason for being less energy conscious is the lack of consumption feedback (56% of respondents). The fact that saving energy does not save money as well follows with 30% and limitations of the building structure and its systems with 28%. The least important reasons for being less energy conscious are sustainable living not being for them (1% of respondents), fear of being made fun of (2% of respondents) and lack of inspiration from the university/college to act in an energy saving manner (3% of respondents).

In the UK, the three most important reasons for being less energy conscious are lack of consumption feedback (48% of respondents), the fact that energy savings do not lead to money savings (40% of respondents) and the fact that students have other things on their mind (32% of respondents). The least important reasons for being less energy conscious are sustainable living not being for them and fear of being made fun of (2% of respondents, respectively) and lack of inspiration from the university/college and from the hall's managements to act in an energy saving manner (5% of respondents, respectively).

Table 21 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	8%	17%	46%	30%	40%
Others will make fun of me	0%	3%	4%	2%	2%
I don't know how	8%	14%	3%	13%	11%
I don't have any feedback on how much I consume	21%	36%	43%	56%	48%
I have other things on my mind	21%	17%	16%	22%	32%
Sustainable living is not for me	5%	3%	2%	1%	2%
My university/college does not inspire me to act in this way	8%	14%	15%	3%	5%
The hall management does not inspire me to act in this way	0%	17%	40%	16%	5%
My personal actions to save energy would have minimal impact on the energy consumption of the hall	13%	28%	21%	13%	23%
The other hall residents are not engaged in saving energy either	11%	3%	15%	14%	13%
The way the building and its systems are designed limit the things I can do to save energy	18%	50%	29%	28%	18%
Nothing prevents me from being energy conscious	61%	28%	20%	23%	25%

4.3 Results: Comparison with control group

In the first year of the competition a control group from Linkoping, Sweden was recruited. The treatment group is consisting of the Stockholm and Gothenburg dormitories. 979 valid responses were collected from occupants of the control group buildings and 968 from the treatment group buildings (Table 2). 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 with the final questionnaire responses.

4.3.1 Respondent characteristics

The number of male respondents is higher than for female respondents in both the treatment and control group. Some differences are found between the groups ($\chi^2(4)=16.128$, $p=.003$). 48% of respondents are male for each of the groups but the number of female respondents is higher in the treatment group (39% female in treatment group, 35% in control group). However, the percentage of respondents that did not answer the question is 4% higher in the control group.

Significant differences are found in the age groups that participated in the survey from the two groups ($\chi^2(4)=95.759$, $p<.001$). The number of respondents from the treatment group that are 17-24 years of age is large (56% of respondents) but not as large as the number from the control group (70% of respondents). Almost one third of respondents from the treatment group are between 24-35 years of age while only 14% from the control group is in that age group.

Significant differences in the origin of students are also found between the two groups ($\chi^2(3)=88.009$, $p<.001$). More than half (57%) of the respondents of the control group are native while less than half (42%) of the respondents from the treatment group are native. 48% of the treatment group respondents are not from Sweden. In the control group, the percentage of non-native is 28%.

Table 22 Treatment and control group demographics

	Treatment group	Control group
Gender		
Male	48%	48%
Female	39%	35%
Other	0%	1%
Prefer not to say	3%	1%
skipped question	11%	15%
Age		
<17 years	0%	0%
17-24	56%	70%
24-35	32%	14%
>=35	0%	1%
skipped question	11%	15%
Nationality		
Native	42%	57%
EU citizen	24%	16%
non-EU citizen	24%	12%
skipped question	11%	15%
Year of study		
1st Year University	15%	31%
2nd Year University	18%	22%

>2nd Year University	19%	22%
PGr - Masters	40%	22%
PGr - Doctorate	7%	0%
Other	1%	2%
skipped question	0%	0%
Subject of studies		
Architecture / Engineering / Technology	47%	54%
Arts / Humanities	8%	8%
Health Sciences / Medicine	14%	10%
Mathematics / Physical Sciences	11%	8%
Social Sciences	20%	21%
skipped question	0%	0%

Significant differences are also found in the year of study of the respondents between the two groups ($\chi^2(5)=175.551$, $p<.001$). In the control group a good mix of students from different years and levels of education is found. In the treatment group the number of postgraduate students is much larger compared to the control group (47% from the treatment group, 22% from the control group).

Differences are also found in the subject of study of the respondents between the two groups ($\chi^2(4)=13.816$, $p=.008$). The biggest percentage of respondents study architecture, engineering or technology in both groups but in the control group this number is higher (54% for control group, 47% for treatment group). A small difference is also found in the number of students studying health sciences and medicine (14% in treatment group, 10% in control group) and mathematics and physical sciences (11% in treatment group, 8% in control group).

4.3.2 Lifestyle

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

4.3.2.1 Energy saving efforts in current lifestyle

Some differences exist in the current lifestyle of respondents between the two groups ($\chi^2(5)=13.885$, $p=.016$). The biggest majority of respondents in both groups do from one or two things to quite a few to save energy in their everyday life (56% in treatment group, 55% in control group). 4% less respondents from the treatment group do nothing to save energy while 3% more compared to the respondents from the control group try to save energy in most things or everything they do.

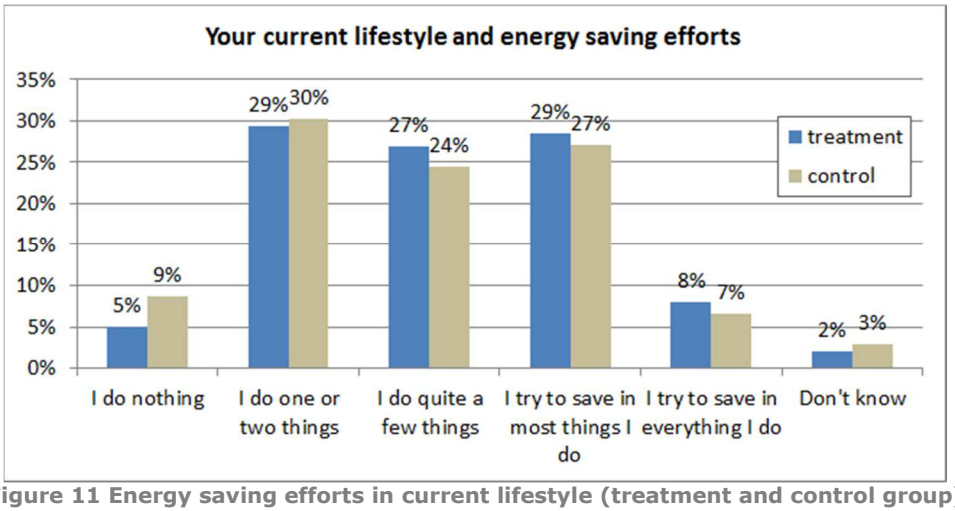

Figure 11 Energy saving efforts in current lifestyle (treatment and control group)

4.3.2.2 Opinion about energy saving efforts in current lifestyle

Differences between the two groups in the feelings about current efforts to save energy are significant ($\chi^2(3)=27.779$, $p<.001$). Almost half of the respondents from both countries would like to do a bit more to save energy in their current lifestyle (48% in treatment, 45% in control group). The number of respondents that are happy with what they do now is higher in the control group (8% more respondents than from the treatment group), while 7% more respondents from the treatment group would like to do a bit more.

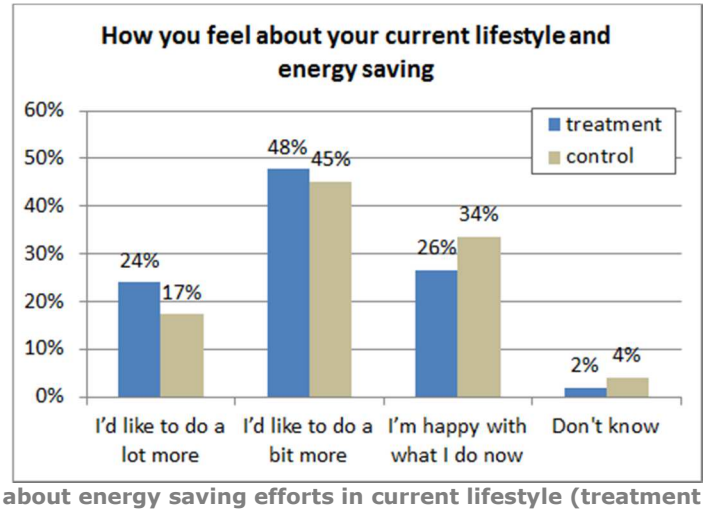

Figure 12 Opinion about energy saving efforts in current lifestyle (treatment and control group)

4.3.2.3 Energy saving efforts in future lifestyle

The distribution of responses on energy saving efforts in future lifestyle is similar for both groups. In fact, no significant differences are found between the groups ($\chi^2(5)=5.812$, $p=.325$). The majority of respondents will be doing about the same to save energy when they move out of dormitories (39% in treatment group and 40% in control group). 1% more respondents from the treatment group will be doing more (55% in treatment group and 54% in control group). The percentage of respondents that will be doing less in the future to save is very small (2%) in both groups.

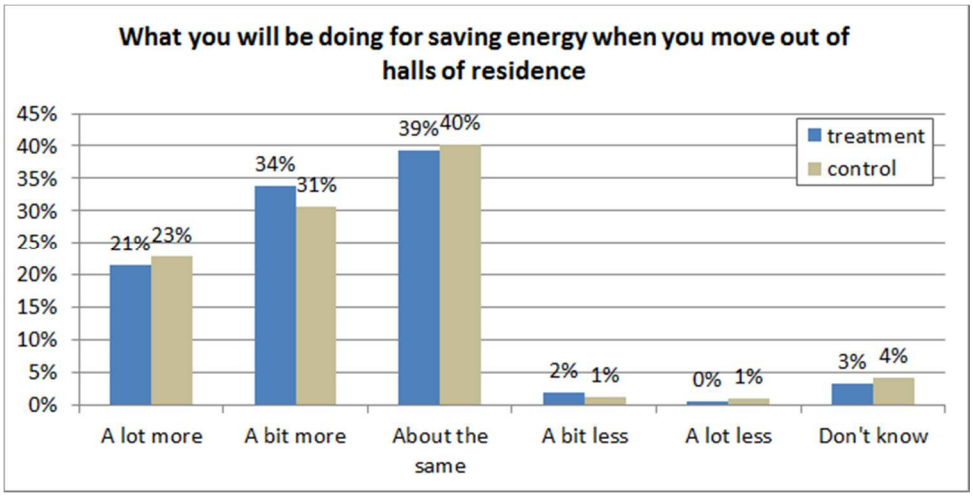

Figure 13 Opinion about energy saving efforts in future lifestyle (treatment and control group)

4.3.3 Knowledge

4.3.3.1 (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).

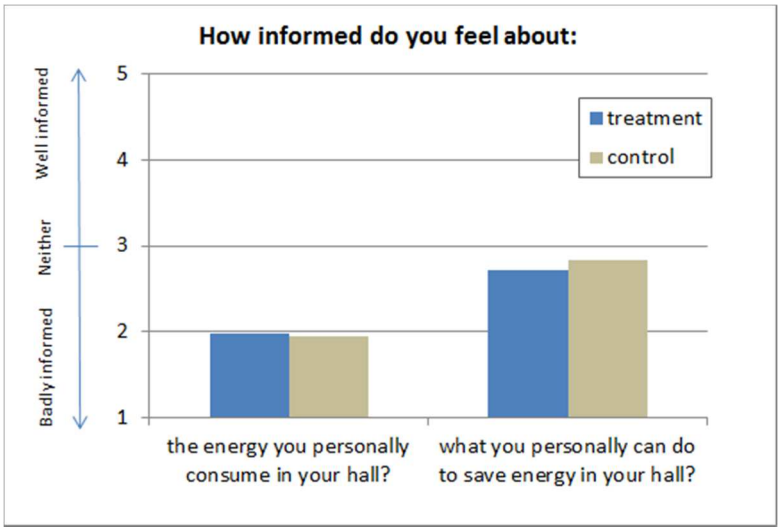

Figure 14 Mean values for perceived level of information on a) personal energy use and b) ways to save energy (treatment and control group)

Differences between the two groups are not significant for any of the two types of information either ($\chi^2(4)=7.947$ p=.094 for a); $\chi^2(4)=8.143$ p=.086 for b)). In both groups the perceived level of information on what can be done at personal level to save energy is noticeably higher than the level of information on what is actually consumed. The perceived level of information on what is actually consumed is marginally higher in the treatment group (mean value of 1.99 for the treatment group and 1.95 for the treatment group). The perceived level of information on what can be done at personal level to save energy in dormitories is slightly higher in the control group (mean value of 2.84 for the control group and 2.71 for the treatment group).

Table 23 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**	1,99	1,085
	control	1,95	1,072
b. what you personally can do to save energy in your hall?	**treatment**	2,71	1,139
	control	2,84	1,149

4.3.3.2 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 actually energy saving actions.

Switching off lights is the most recognized energy saving action in both groups, while in both groups the least recognized action is that of using the microwave oven rather than the cooker. From the six behaviours targeted by the project the least known action differs between the two groups. In the treatment group the least known action is that of putting a lid on pans when cooking while in the control group it is that of putting on an extra layer instead of turning on the heating.

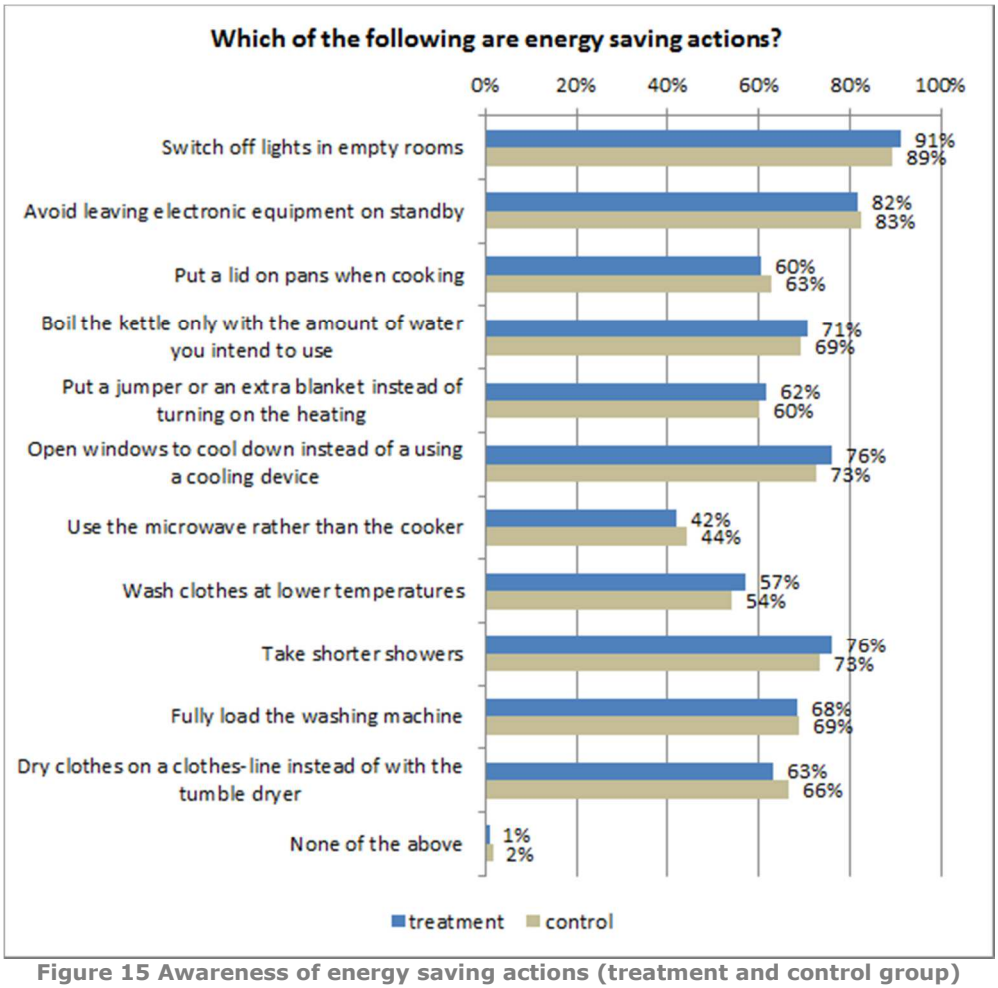

Figure 15 Awareness of energy saving actions (treatment and control group)

4.3.4 Habits and practices

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

There are no statistically significant differences in the frequency that a lid is put on pans when cooking ($\chi^2(4)=1.101$, p=.894), the right amount of water is boiled in the kettle ($\chi^2(4)=7.452$, p=.114) and an extra layer is applied instead of the heating ($\chi^2(4)=1.574$, p=.813) in the two groups.

Some differences are found however between the two groups, in the frequency that lights are switched off ($\chi^2(4)=16,620$, p=.002), that windows are opened as a mean of cooling ($\chi^2(4)=9.779$, p=.044) and that electronic equipment are left on stand-by ($\chi^2(4)=10.213$, p=.037).

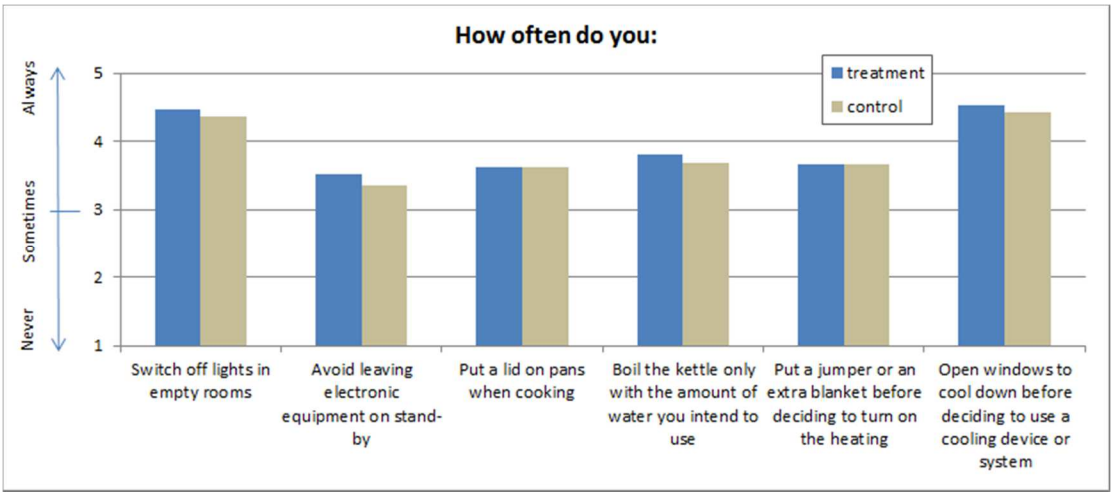

Figure 16 Mean values for frequency in which energy saving actions are performed (treatment and control group)

The energy saving actions followed more frequently in both groups are those of switching off lights and opening windows for cooling (Table 24). The action performed least often is that of avoiding leaving electronic equipment on stand-by, although mean values for avoiding leaving electronic equipment on stand-by, putting a lid on pans, putting extra layers on and boiling only the right amount of water are very similar.

Table 24 Mean values and standard deviations for frequency in which energy saving actions are performed (treatment and control group)

Action	Group	M	SD
Switch off lights in empty rooms	**treatment**	4,48	,717
	control	4,36	,766
Avoid leaving electronic equipment on stand-by	**treatment**	3,53	1,122
	control	3,36	1,163
Put a lid on pans when cooking	**treatment**	3,63	1,150
	control	3,62	1,175
Boil the kettle only with the amount of water you intend to use	**treatment**	3,80	1,103
	control	3,69	1,159
Put a jumper or an extra blanket before deciding to turn on the heating	**treatment**	3,66	1,229
	control	3,66	1,195
Open windows to cool down before deciding to use a cooling device or system	**treatment**	4,54	,823
	control	4,44	,940

4.3.5 Behavioural antecedents

Overall, 13 items from 9 variables of behaviour change theory and models were measured with the survey. Items were evaluated on a 5-point Likert Scale (1= Strongly disagree, 5 = Strongly Agree) with higher values indicating a higher level of agreement with the statement.

Personal norms

Personal norms were measured through two items. The differences between the two groups are statistically significant for both items (PN-1 ($\chi^2(4)=22.621$, $p<.001$); PN-2 ($\chi^2(4)=42.319$, $p<.001$)). Both the feeling of moral obligation to save energy (PN-1) and the sense of guilt when using a lot of energy (PN-2) are higher in the treatment group.

Table 25 Mean values and standard deviations for personal norms items (treatment and control group)

		Treatment group		Control group	
Personal norms		**M**	**SD**	**M**	**SD**
PN-1	I feel morally obliged to save energy	3,90	,926	3,68	1,003
PN-2	I feel guilty when I use a lot of energy	3,58	1,050	3,26	1,091

Ascription of responsibility

Ascription of responsibility was measured with one item. Differences between the two groups are not statistically significant ($\chi^2(4)=4.252$, p=.373). The level of responsibility that respondents seem to take for climate change is high in both groups (mean value > 4.00).

Table 26 Mean values and standard deviations for ascription of responsibility item (treatment and control group)

		Treatment group		Control group	
Acription of responsibility		**M**	**SD**	**M**	**SD**
AR-2	Everyone including myself is responsible for climate change	4,36	,874	4,29	,904

Awareness of consequences

Awareness of consequences was measured with one item. Differences are not significant between the two groups ($\chi^2(4)=7.331$, p=.119) and awareness is rather high in both groups (mean value > 4.00).

Table 27 Mean values and standard deviations for awareness of consequences item (treatment and control group)

		Treatment group		Control group	
Awareness of consequences		**M**	**SD**	**M**	**SD**
AC-1	Energy conservation contributes to a reduction of the climate change impacts	4,39	,815	4,31	,840

Attitudes

Attitudes were measured with two items. The differences between the two groups are significant for the first item (ATT-1 ($\chi^2(4)=11.690$, p=.020) and not significant for the second item (ATT-2 ($\chi^2(4)=5.259$, p=.262). Disagreement with the statements that saving energy is too much of a hassle (ATT-1) and that saving energy means that they have to live less comfortably (ATT-2) is slightly higher in the treatment group.

Table 28 Mean values and standard deviations for attitudes items (treatment and control group)

		Treatment group		Control group	
Attitude		**M**	**SD**	**M**	**SD**
ATT-1	Saving energy is too much of a hassle	2,20	,907	2,34	,918
ATT-2	Saving energy means I have to live less comfortably	2,52	1,016	2,63	1,053

Perceived behavioural control

Perceived behavioural control was measured with two items. The differences between the two groups are significant for both items (PBC-1 ($\chi^2(4)=13.894$, p=.008); PBC-2 ($\chi^2(4)=17.445$, p=.002)). In both groups respondents perceive that their energy use is something that they can reduce in a more or less easy way. The perception of control over how much energy is used (PBC-2) is lower in both groups compared to self-efficacy and slightly higher in the treatment group.

Table 29 Mean values and standard deviations for perceived behavioural control items (treatment and control group)

		Treatment group		Control group	
Perceived behavioural control		**M**	**SD**	**M**	**SD**
PBC-1	I can reduce my energy use quite easily	3,41	,954	3,41	,865
PBC-2	I feel in complete control over how much energy I use	2,69	1,055	2,56	1,041

Subjective norms

Subjective norms were measured through two items: an injunctive item (SN-1) and a descriptive item (SN-2). The differences between the treatment and the control group are not statistically significant for any of the two items (SN-1 ($\chi^2(4)=3.873$, p=.423); SN-2 ($\chi^2(4)=.892$, p=.926)).

Respondents don't perceive that saving energy is something that is expected from them (SN-1) in any of the two groups. However, the perception that people who are important to the respondents try to pay attention to their own energy use (SN-2) is more positive than their perception of what is expected from them but closer to neutral.

Table 30 Mean values and standard deviations for subjective norm items (treatment and control group)

		Treatment group		Control group	
Subjective norm		**M**	**SD**	**M**	**SD**
SN-1	Most people who are important to me think that I should use less energy	2,13	,966	2,16	,931
SN-2	Most people who are important to me try to pay attention to their energy use	3,08	,921	3,05	,932

Emotions

Emotions were measured with one item. Statistically significant differences exist between the two groups ($\chi^2(4)=25.437$, p<.001). Saving energy seems to have a positive impact on both groups' emotions with the highest impact found in the treatment group.

Table 31 Mean values and standard deviations for emotions item (treatment and control group)

		Treatment group		Control group	
Emotions		**M**	**SD**	**M**	**SD**
EMO-1	Doing things to save energy makes me happy	3,66	,910	3,46	,974

Role beliefs

Role beliefs were measured through one item. Differences are found to be significant between the two groups ($\chi^2(4)=16.239$, p=.003). The perception that as residents dormitories respondents should be more concerned about their energy consumption is more positive than negative in both groups with a slightly higher concern in the treatment group.

Table 32 Mean values and standard deviations for role beliefs item (treatment and control group)

		Treatment group		Control group	
Role beliefs		**M**	**SD**	**M**	**SD**
ROL-1	As a resident of the dorms I should be more concerned about my energy use during my stay there	3,27	,986	3,12	,957

Intention

Finally, respondents were asked to indicate their intention to try harder to save energy over the next academic year through one item. Differences exist in the level of intention to save energy between the two groups ($\chi^2(4)=13.921$, p=.008). Mean values indicate more positive rather than negative intentions towards energy saving for the next academic year in both groups with a slightly higher intention found in the treatment group.

Table 33 Mean values and standard deviations for intentions item (treatment and control group)

		Treatment group		Control group	
Intention		**M**	**SD**	**M**	**SD**
INT-1	I intend to try harder to reduce my energy use this academic year	3,40	,960	3,25	,962

4.3.6 Opportunities for energy saving

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

The least important reasons (1% to 3% of respondents) for being more energy conscious in both groups are those associated with other peoples' opinion, namely, fitting in with other residents of the dormitory, other peoples' approval and someone else asking.

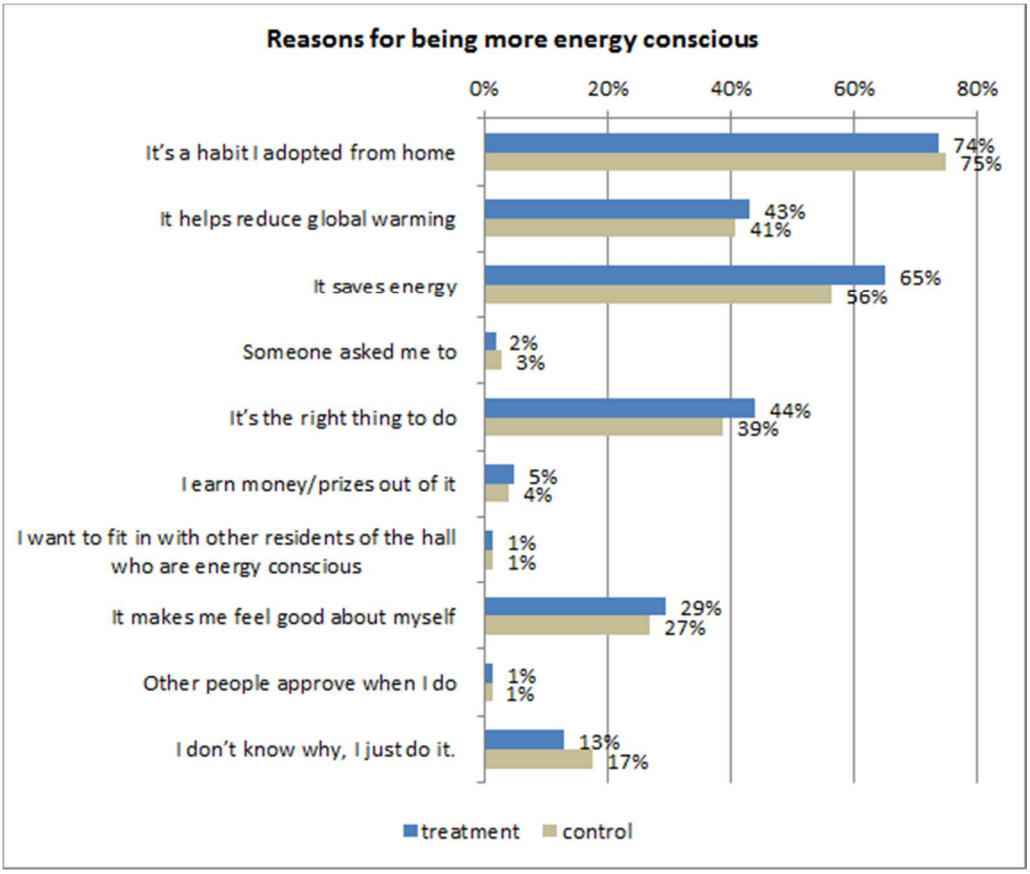

Figure 17 Reasons for being more energy conscious (treatment and control group)

4.3.6.2 Barriers

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

In both groups the two most important reasons are lack of consumption feedback and the fact that saving energy does not save money. In the treatment group, limitations of the building structure and its systems play an important role (28% in treatment group, 19% for control group). The third most important reason for the control group is the fact that students have other things on their mind (24% for the control group, 22% for the treatment group).

The least important reasons (1% to 4% of respondents) for being less energy conscious are common for both groups. Those are 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.

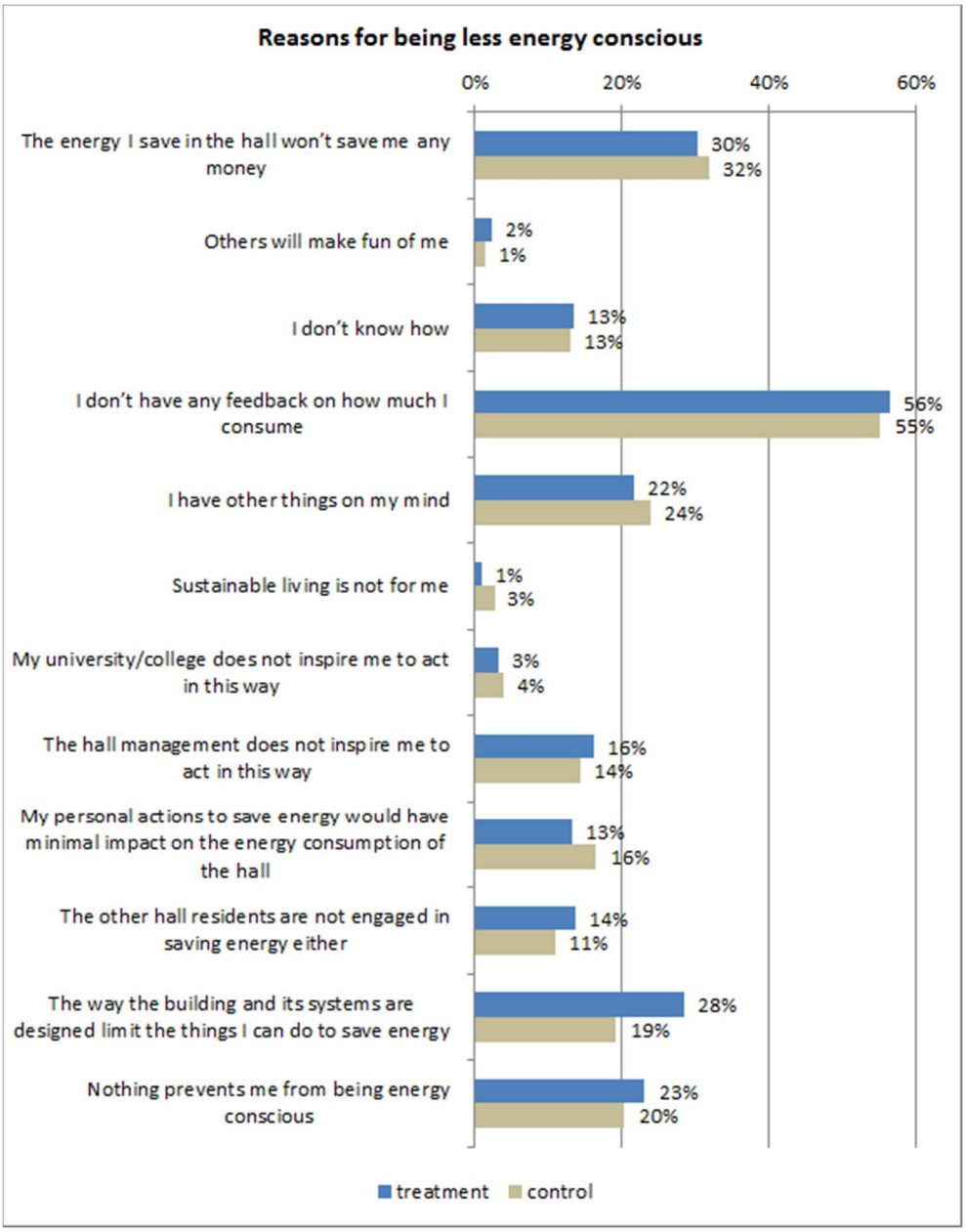

Figure 18 Reasons for being less energy conscious (treatment and control group)

4.4 Summary of main findings

DEMOGRAPHICS

Gender

- A good mix of male and female respondents answered the questionnaire. Significant differences in gender exist across countries ($p<.001$). Differences are also found between the treatment and the control group ($p<.01$).
- The number of female respondents is higher than the number of male respondents in Cyprus, Greece, Lithuania and the UK. The largest percentage of female respondents is found in Cyprus (72% female) while the largest percentage of male respondents is found in Sweden (48% male).
- The number of male respondents is higher than for female respondents in both the treatment and control group. 48% of respondents are male in each of the two groups but the number of female respondents is higher in the treatment group (39% female in treatment group, 35% in control group). However, the percentage of respondents that did not answer the question is 4% higher in the control group.

Age

- Significant differences in the age of respondents are found across countries and between the treatment and control group ($p<.001$).
- The biggest majority of respondents is between 17-24 years of age in all countries. In Sweden a large percentage of respondents (32%) is also between 24-35 years of age.
- The number of respondents from the treatment group that are 17-24 years of age is large (56% of respondents) but not as large as the number in the control group (70% of respondents). Almost one third of respondents from the treatment group are between 24-35 years of age while only 14% from the control group is in that age group.

Nationality

- Across individual countries and between the treatment and control group significant differences are found in the origin of the students studying there ($p<.001$).
- The majority of total respondents are native to the country they study in (54% of total). In the UK, but especially in Sweden, students come from many parts of the world. On the other hand, in Lithuania and Greece students are only native. In Cyprus students are either native or from other EU countries.
- More than half (57%) of the respondents of the control group are native while less than half (42%) of the respondents from the treatment group are native. 48% of the treatment group respondents are non-native. In the control group, the percentage of non-native is 28%.

Level of education

- At project level, a good mix of students from different years and levels of education is found. The majority of total respondents are in their 1st year in university (42%) followed by students doing their masters (22%).
- Significant differences in the level of studies of the respondents are observed across individual countries and between the treatment and control group ($p<.001$).
- A small number of respondents from Sweden and the UK selected the "other" option. These students are mainly exchange students (Erasmus or international), top-up students or research associates.
- In Cyprus and Greece more than half of the students (54% and 74%, respectively) are in year 3 or higher of their undergraduate studies. The biggest majority of respondents (95%) from Lithuania are undergraduates. In Sweden a good mix of undergraduates and post-graduates is observed (52% and 47%, respectively). 72% of students in the UK are in their first year of studies and 18% are doing their masters.
- In the control group a good mix of students from different years and levels of education is found. In the treatment group the number of postgraduate students is much larger compared to the control group (47% from the treatment group, 22% from the control group).

Subject of study

- Respondents study all main subjects in all countries, but subjects studied across countries vary significantly ($p<.001$). Differences are also found in the subject of studies between treatment and control group respondents ($p<.01$).

- Overall, the biggest percentage of total respondents (37%) study architecture, engineering or technology, 21% study social sciences, 16% study mathematics and physical sciences, 14% study arts and humanities and 11% study health sciences and medicine.
- In Greece, Lithuania and Sweden the number of students studying architecture, engineering or technology, and therefore are assumed to have the best level of knowledge or awareness of energy saving issues, is high (60% in Greece, 41% in Lithuania and 47% in Sweden). In Cyprus this number is rather low (15% of respondents). For the UK it is 28%.
- The biggest percentage of respondents study architecture, engineering or technology in both the treatment and control group but in the control group this number is higher (54% for control group, 47% for treatment group). A small difference is also found in the number of students studying health sciences and medicine (14% in treatment group, 10% in control group) and mathematics and physical sciences (11% in treatment group, 8% in control group).

LIFESTYLE

Energy saving efforts in current lifestyle

- Only a small percentage (<6%) of respondents from all countries, apart from Lithuania, think that they do nothing to save energy. In Lithuania the percentage is 11%. In Cyprus this percentage is in fact 0%.
- In Lithuania, Sweden and the UK, the majority of respondents do one or two things to quite a few things in their everyday life to save energy. In Cyprus and Greece the majority of respondents try to save energy in most things or everything they do.
- The biggest majority of respondents in both the treatment and the control group do from one or two things to quite a few to save energy in their everyday life.
- The percentage of respondents that do nothing to save energy is 4% higher in the control group, compared to the treatment group, while 3% less respondents from the control group try to save energy in most things or everything they do.

Opinion about energy saving efforts in current lifestyle

- The biggest percentage of respondents in the control group and in all countries, apart from Greece, would like to do a bit more to save energy in their current lifestyle. In Greece the majority of respondents would like to do a lot more to save energy.
- A very large percentage of respondents in all countries and in the control group are happy with what they do at the moment. The biggest percentage is found in Cyprus and the smallest in Sweden (5% difference between them).
- The number of respondents that are happy with what they do now is higher in the control group, while the number of respondents that would like to do a bit more to save energy is higher in the treatment group.

Energy saving efforts in future lifestyle

- Only a marginal number of respondents think that they will be doing less than what they are currently doing in their dormitories in the future in all countries and in the control group.
- The majority of respondents in the control group and in all countries apart from Lithuania think that they will probably be doing about the same to save energy when they move out of dormitories. In Cyprus the same number of respondents also think that they will be doing a lot more to save energy in the future. In Lithuania the majority of respondents think that they will be doing a lot more to save energy when they move out of halls of residence.

KNOWLEDGE

(Perceived) level of information

- Significant differences exist 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 difference is found for any of the two types of information ($p>.05$).
- In all countries and the control group the perceived level of information on what can be done at personal level to save energy is noticeably higher than the level of information on what is actually consumed.
- Overall, respondents feel badly informed about their own energy consumption (mean value <3). The highest level of information on own energy consumption is found in Cyprus and the lowest in Lithuania and Sweden. The perceived level of information on what is actually consumed is marginally higher in the treatment group compared to the control group.

- On what can be done at personal level to save energy the overall level of information is closer to neutral. The highest level of information on what can be done to save energy in dormitories is again found in Cyprus and the lowest in Lithuania and Sweden. The perceived level of information on what can be done at personal level to save energy in dormitories is slightly higher in the control group compared to the treatment group.

Awareness of energy saving actions

- The energy saving action that the majority of respondents is aware of in all countries and the control group is that of switching off lights in empty rooms.
- The action that students are least aware of is that of using the microwave oven rather than the cooker.
- From the six behaviours targeted by the project the least know in all countries and the treatment group is that of putting a lid on the pans when cooking. In the control group it is that of putting on an extra layer instead of turning on the heating.

HABITS AND PRACTICES

- There are no statistically significant differences in the frequency that lights are switched off across countries ($p>.05$). Significant differences ($p<.001$) are found however, in the frequency that a lid is put on pans when cooking and windows are opened as a mean of cooling. Some differences ($p<.05$) are also found across countries in the frequency that appliances are left on stand-by, the right amount of water is boiled with the kettle, and, an extra layer is applied instead of the heating.
- Between the treatment and the control group no statistically significant differences ($p>.05$) are found in the frequency that a lid is put on pans when cooking, the right amount of water is boiled with the kettle and an extra layer is applied instead of the heating. Some differences ($p<.05$) are found however, in the frequency that lights are switched off, that windows are opened as a mean of cooling and that electronic equipment are left on stand-by.
- The energy saving actions with the highest habit strength are those of switching off lights and opening windows for cooling.
- The action performed least often is that of putting a lid on pans when cooking (Cyprus and the UK), boiling the right amount of water in the kettle (Greece), and avoiding leaving equipment on stand-by (Sweden and control group).

BEHAVIORAL ANTECEDENTS

- Overall results indicate a more positive attitude towards energy saving and a stronger feeling that others do not expect from respondents to use less energy.
- Also a high level of ascription of responsibility but also a high level of awareness of the impacts of energy consumption on the environment is also met in countries.

Personal norms

- The differences across countries and between the treatment and control group are significant for both items ($p<.001$).
- The feeling of moral obligation to save energy is rather strong across countries. The highest feeling of obligation is found in Cyprus and the lowest in Lithuania.
- Respondents in all countries seem to feel some guilt when using a lot of energy. The feeling of guilt is higher in Cyprus, Sweden and the UK and lower in Greece. In Lithuania respondents are closer neutral.
- Both the feeling of moral obligation to save energy and the sense of guilt when using a lot of energy are higher in the treatment group.

Ascription of responsibility

- Differences are significant across countries ($p<.001$). Between the treatment and the control differences are not statistically significant ($p>.05$).
- Respondents in all countries seem to agree more rather than disagree with the fact that they are responsible for climate change.
- The strongest feeling of responsibility is found in Sweden and the lowest in Greece.

Awareness of consequences

- Difference in awareness of consequences is significant across countries ($p<.001$). Contrarily, no significant differences are found between the treatment and control group ($p>.05$)

- Awareness of the consequences that energy consumption has on the climate is rather high in all countries. The highest level of awareness is found in Cyprus and Sweden and the lowest in Lithuania.

Attitudes

- The differences across countries are significant for both attitudes items ($p<.01$). On saving energy being too much of a hassle differences between the treatment and control group are significant ($p<.05$) while on saving energy meaning that they have to live less comfortably no statistically significant differences are found ($p>.05$)
- Respondents seem to disagree, in some cases more in some cases less, that saving energy is too much of a hassle. Saving energy is considered less of a hassle in Cyprus and Greece and more of a hassle in Lithuania and the UK.
- Respondents also tend to disagree rather than agree with the statement that saving energy means that they have to live less comfortably. In Cyprus the perception that energy saving compromises their living comfort is not as strong as it is in Lithuania.
- Disagreement with the statements that saving energy is too much of a hassle and that saving energy means that they have to live less comfortably is slightly higher in the treatment group.

Perceived behavioural control

- The differences across countries are significant for both the item measuring self-efficacy and the item measuring controllability ($p<.001$). Significant differences are also found between the treatment and control group ($p<.01$).
- Overall, the perception that personal energy use can be easily reduced is positive; in some countries more in some other countries less. The strongest perception is found in Cyprus and the lowest in Greece.
- The perception of control over how much energy is used is lower in all countries compared to self-efficacy and is in some countries positive (Cyprus), in others negative (Greece, Lithuania, Sweden) and in others neutral (the UK). The highest perception is found in Cyprus and the lowest in Sweden.
- In both the treatment and the control groups respondents perceive that their energy use is something that they can reduce in a more or less easy way. The perception of control over how much energy is used is lower in both groups compared to self-efficacy and slightly higher in the treatment group.

Subjective norms

- The differences across countries are significant for both the injunctive and the descriptive item ($p<.001$). The differences are not statistically significant between the treatment and the control group for any of the two items ($p>.05$).
- Overall, respondents don't perceive that saving energy is something that is expected from them in any of the countries or the control group. The perception that something is expected from them is higher in Cyprus and the UK and lower in Lithuania.
- The perception that people who are important to the respondents try to pay attention to their own energy use is more positive than their perception of what is expected from them. This perception is stronger in Cyprus and weaker in Lithuania.

Emotions

- Significant differences are found in the impact that emotions have on energy consumption across countries and between the treatment and control group ($p<.001$).
- Emotions have the highest impact in Cyprus and the lowest in Lithuania.
- Between the treatment and the control group the highest impact is found in the treatment group.

Role beliefs

- Differences in role beliefs are found to be significant across countries and between the treatment and control group ($p<.001$).
- Respondents tend to agree more rather than disagree with the perception that as residents of the dormitories they should be more concerned about their energy consumption. The lowest concern is found in Lithuania, Sweden and the UK and the highest in Cyprus.
- Between the treatment and control group a slightly higher concern is found in the treatment group.

Intention

- Differences in intention to try harder to save energy over the next academic are significant across countries ($p<.001$). Differences also exist between the treatment and the control group ($p<.01$).

- Mean values indicate more positive than negative intentions towards energy saving for the next academic year across all countries and in the control group. The lowest intention is found in Lithuania and the highest in Cyprus.
- Between the treatment and the control group a slightly higher intention is found for the treatment group.

OPPORTUNITIES FOR ENERGY SAVING

Incentives

- The most important reasons for being more energy conscious are common for all countries and for the control group. Those are:
  - 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 are common for all countries and the control group and are 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 are common for all countries and for the control group. Those are:
  - 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 also feel that nothing prevents them from being energy conscious.
- The least important reasons for being less energy conscious are 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 reasons varies across countries. Only the lack of consumption feedback remains in the top three reasons in all countries and the control group.

Appendix A – Baseline questionnaire survey (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 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)

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

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

*** 5. Which one 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

*** 6. Which one 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

*** 7. Which <u>one</u> of these statements best describes how you think you will be living when you move out of halls of residence?**

- ○ I think I'll be doing a lot more to save energy
- ○ I think I'll be doing a bit more to save energy
- ○ I think I'll probably be doing about the same to save energy
- ○ I think I'll be doing a bit less to save energy
- ○ I think I'll be doing a lot less to save energy
- ○ 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. This section of the questionnaire is designed to find out about your opinions and attitudes to different issues. 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
I can reduce my energy use quite easily	○	○	○	○	○
I feel guilty when I use a lot of energy	○	○	○	○	○
Most people who are important to me try to pay attention to their energy use	○	○	○	○	○
Doing things to save energy makes me happy	○	○	○	○	○
I feel in complete control over how much energy I use	○	○	○	○	○
Energy conservation contributes to a reduction of climate change impacts	○	○	○	○	○
Saving energy means I have to live less comfortably	○	○	○	○	○
Most people who are important to me think that I should use less energy	○	○	○	○	○
Saving energy is too much of a hassle	○	○	○	○	○
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	○	○	○	○	○
I intend to try harder to reduce my energy use this academic year	○	○	○	○	○

*** 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
- [ ] Use the microwave rather than the cooker
- [ ] Wash clothes at lower temperatures
- [ ] Take shorter showers
- [ ] Fully load the washing machine
- [ ] Dry clothes on a clothes-line instead of with the tumble dryer
- [ ] 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.	

Other (please specify)

*** 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?**

- ○ under 17
- ○ 17-24
- ○ 25-34
- ○ 35-44
- ○ 45-54
- ○ 55-64
- ○ 65 or older

*** 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 – Variables from behaviour change theory and models

Variable	Item code	Items	NAM	TPB	TIB
Personal norms	**PN-1**	I feel morally obliged to save energy, regardless of what other people do	√		√
	PN-2	I feel guilty when I use a lot of energy			
Ascription of responsibility	**AR-1**	I feel jointly responsible for climate change	√		
Awareness of consequences	**AC-1**	Energy conservation contributes to a reduction of the climate change impacts	√		
Attitude	**ATT-1**	Saving energy is too much of a hassle		√	√
	ATT-2	Saving energy means I have to live less comfortably			
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			
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			√
Role beliefs	**ROL-1**	As a resident of the dorms I should be more concerned about my energy use during my stay there			√
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 C – 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												ACTUAL USAGE																				ADJUSTED BASELINE									
				2013				2014								2014				2015										2016															
University Name	Dorm name	Student no.s	Electrically heated (Y/N)	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	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
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	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
				Degree day data																																									

SAVES