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**Empowering Students to Save Energy  
through a Behavioural Change Campaign  
in University Accommodation**

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**Abstract**

*Energy awareness campaigns are critical in enabling students to become more aware of the impacts of energy use and to effectively establish sustainable habits and lifestyle practices. They can provide a foundation of energy literacy and sustainability to students living in university dormitories and can help them reduce energy wastage even when they move out into the private sector. In this work we aim to investigate the impact of an energy awareness campaign, Student Switch Off (SSO), on university students by quantifying the behaviour changes that may be attributed to it. Changes in the behaviour of students in participating dormitories were evaluated through four rounds of questionnaire surveys during the academic years 2018-19 and 2019-20. In total, more than 9,000 students living in participating university accommodation answered the questionnaires. The findings show positive signs of impact of the SSO campaign with the most indicative sign being that a higher share of students tried to save energy in most things or even in everything they did by the end of the evaluation period compared to the beginning.*

**Keywords:** university students, energy campaign, energy saving, behaviour assessment.

**JEL Classification:** D14, E21, I23, Q40, Q56.

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## **1. Introduction**

The role of human behaviour in energy efficiency should be considered in all aspects of the energy transition. Energy saving lifestyles, which are of societal interest, require conscious decisions from energy users. However, long term behavioural change, which is triggered by training, awareness activities, incentives and feedback, remains a major challenge (Interreg Europe, 2018). Therefore, energy efficiency campaigns should be aligned with the motivations of energy consumers and any recommended energy saving action should be easily integrated into their daily routine to be effective. Within this context, in this study we analyse the impact of the Student Switch Off (SSO) information campaign on students who had been involved with the campaign during their stay in their university's dormitories from September 2018 to June 2020.

Student Switch Off (SSO) is an annual inter-dormitory energy-saving campaign that runs in fourteen universities in seven European countries (Bulgaria, Cyprus, Greece, Ireland, Lithuania, Romania and the United Kingdom) and focuses on a predefined set of activities, encouraging students to save energy in their dormitories. Through SSO a number of engagement activities and instruments are used in order to enable, empower and motivate students to save energy in their dormitories and to change their everyday habits to more energy conscious ones. The campaign encourages any action that can help save energy with specific attention given to six energy conservation actions which are: i) switch off lights in empty rooms, ii) avoid leaving electronic equipment on stand-by, iii) put a lid on the pan when cooking, iv) boil the kettle only with the amount of water you intend to use, v) put on a jumper or an extra blanket instead of turning on the heating, vi) open windows to cool down instead of using a cooling device or system.

## **2. Problem Statement**

Preparing and empowering current and future energy consumers to recognize the adverse effects of energy wastage should be key when planning on how Europe will achieve its sustainable energy goals (Bertoldi, 2020). At the same time, in order to achieve the goal of limiting the rise in global temperature below the critical level of 2oC by the end of the century, a series of actions are needed, including the shaping of citizens' behaviour on issues related to environmental protection (IPCC, 2018). The term "behaviour change" describes how behaviour is the result of behaviour interventions (Susan & Johnston, 2012). Such interventions delivered through educational campaigns on energy awareness could play a vital role in helping university students achieve valuable energy savings and form appropriate habits and eco-friendly lifestyle practices, especially when coupled with formal educational programs (Iordache – Platis & Romanowicz, 2020).

At the same time, the phenomenon of energy poverty is observed either in the form of insufficient access to energy services for developing countries or in the form of excessive energy costs in relation to the disposable income of households in developed countries (Nussbaumer et al., 2012). Although the main drivers of energy

poverty are well documented, up to this date little attention has been given to students as a vulnerable group affected by energy poverty (Kousis et al., 2020); student energy poverty is often under-reported and under-supported (Ntouros et al., 2019). Thus, the adoption of environmentally conscious behaviour among university students as a result of informative campaigns, coupled with educational programs aiming to promote energy saving lifestyles and environmental consciousness to students, contributes significantly to energy saving, alleviates exposure to energy poverty and paves the way for decarbonization (Tsagarakis et al., 2011).

Verplanken and Wood (2006) in their habit discontinuity hypothesis, stated that there are specific moments of change in one's life (e.g. leaving home for the first time, having a first child) during which individuals are more open to making other changes in their lifestyles that can become habitual – including pro-environmental changes. Focusing specifically on students and using the moment of change in their life associated with leaving their homes for the first time and moving into dormitories, the SSO campaign aims to encourage them to get into positive energy-saving habits. At this point of their life, university students are generally embarking on the start of their adult life and so the habits formed can have a considerable long-term benefit for them through both minimizing their long-term energy expenditure and in terms of the associated carbon emission reductions from their energy usage. Furthermore, by increasing students' energy literacy it is likely that the probability of them falling into energy poverty, either in the present or in future, is significantly reduced.

### **3. Research Questions/Aims of the Research**

In this work, we aim to investigate the impact of the Student Switch Off information campaign on university students by quantifying the behaviour changes that may be attributed to it. The quantification is based on self-reported assessment and the evaluation period is the academic years 2018-2019 and 2019-2020.

### **4. Research Methods**

Changes in the behaviour of students in participating dormitories, and thus the impact of the SSO campaign, were evaluated through pre- and post-competition questionnaire surveys. Students in participating dormitories were encouraged to complete a baseline survey at the beginning of the academic year, to identify existing energy-saving attitudes, behaviours and habits, and a follow-up survey at the end of the academic year. Most questions in the follow-up questionnaire were identical to those asked in the baseline survey in order to allow for comparison and evaluation of possible change from the beginning to the end of the academic year.

Online versions of the questionnaire surveys were created on LimeSurvey in Bulgarian, English, Greek, Lithuanian and Romanian. Channels used to disseminate the questionnaire surveys were mainly university and students' unions mailing lists. Moreover, questionnaire surveys were also distributed through social media platforms and in hardcopy format. The target response rate for the baseline

and the follow-up surveys was 15% of students living in each country’s dormitories at the beginning of the academic year. In both surveys the criteria for inclusion in the analysis were: i) the respondent lives in a participating university dormitory, ii) the respondent is older than 18 years old and iii) the respondent answers at least one question related to the current lifestyle about saving energy. Table 1 presents the valid answers collected in each survey period as well as the targets and the number of students living in SSO dormitories.

The questionnaire included multiple-choice and rating scale questions. In the first type of close-ended questions, participants were offered a set of answers they had to choose from, while the second type of questions was Likert-scale type. In Likert scale questions, respondents were asked about the level of agreement with specific statements. Each option was given a score, which was used to analyse results. Descriptive statistics were used to analyse the collected data. Mean values and percentages are presented in the results section as quantitative indicators to measure the level of SSO campaign’s impact.

**Table 1. Number of students living in SSO dormitories, target responses for the baseline and follow-up surveys and valid responses per year**

<b>Number of students living in SSO dormitories, survey targets and valid entries received per year</b>	<b>Year 1 2018-19</b>	<b>Year 2 2019-20</b>
Total number of students living in SSO dorms in the beginning of each academic year	45,385	35,767
Surveys’ target: 15% of students living in dorms per academic year	6,808	5,366
Baseline Survey Valid Entries	2,200	3,249
Follow-up Survey Valid Entries	2,157	1,466

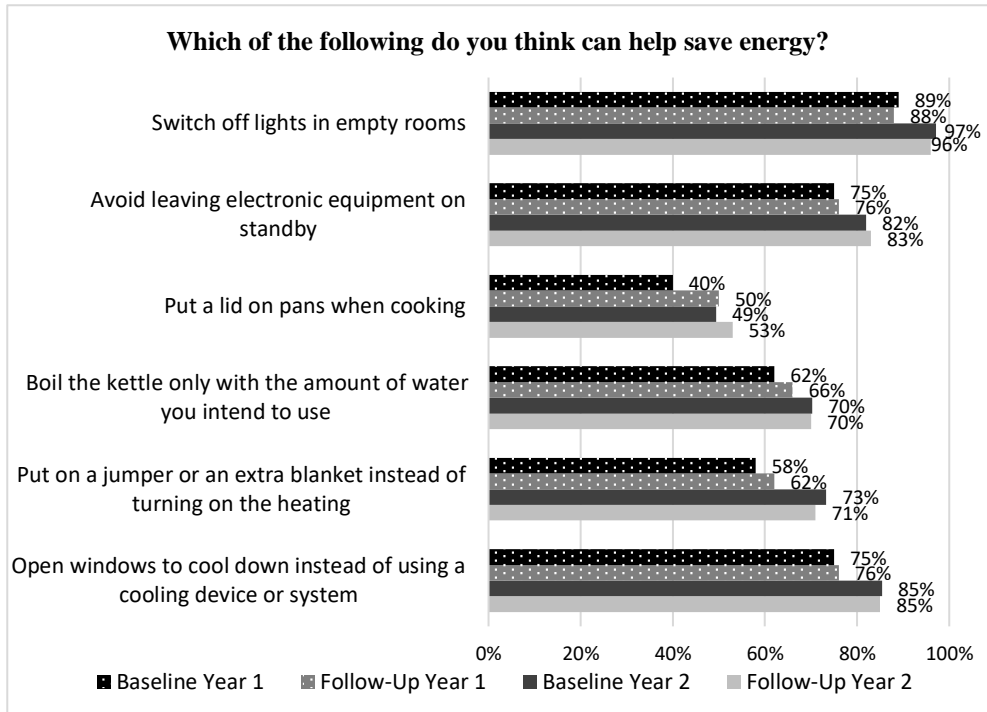
*Source: Authors’ own contribution.*

## **5. Findings**

In the following paragraphs the main findings of this work are presented. The aspects of students’ daily energy saving routines are examined in sections 5.1 and 5.4, the frequency of energy saving actions is explored in section 5.2, while the reasons that might prevent them from being more energy conscious are investigated in section 5.3.

### **5.1. Energy Saving in Everyday Life**

Respondents were asked to choose which of the six targeted behaviours presented in Figure 1 can help save energy.



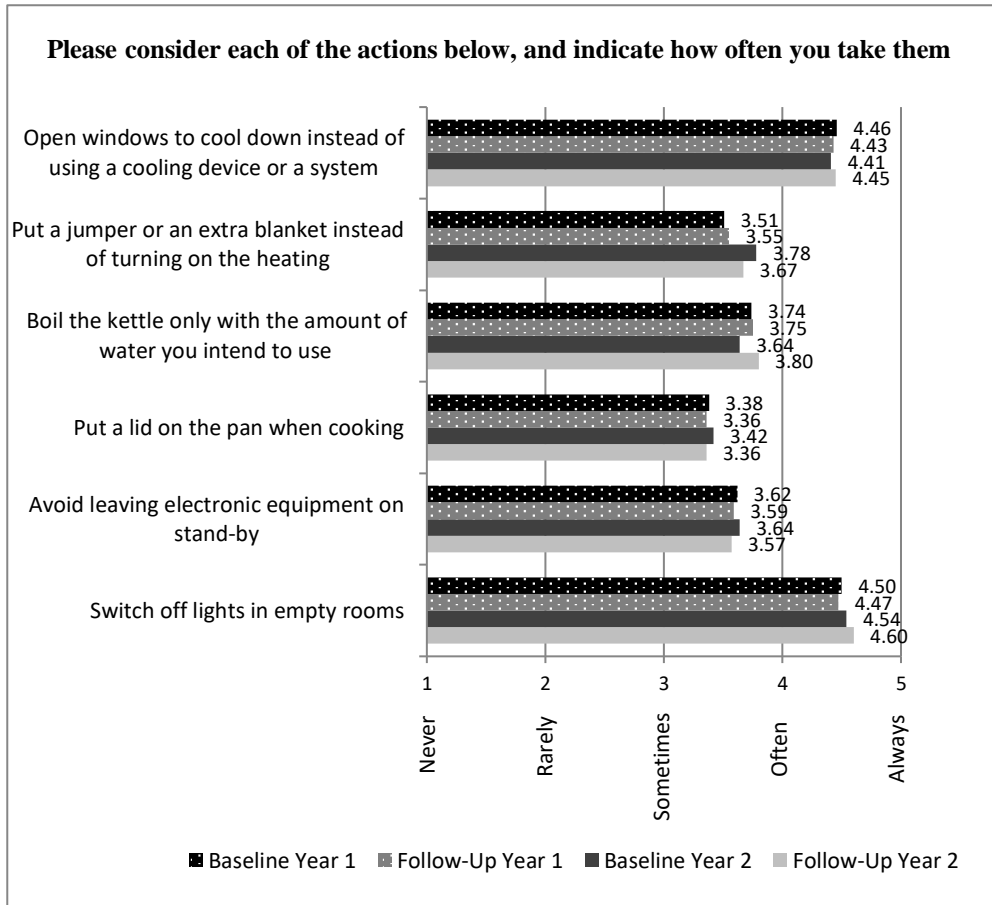
**Figure 1. Energy saving in students' everyday life**

Source: Authors' own contribution.

At the end of the evaluation period, switching off lights in empty rooms was selected by the highest share of respondents (96%) as an action that can help save energy with a +7% increase between the beginning and the end of the evaluation period. “Put on a jumper or an extra blanket instead of turning on the heating” and “Put a lid on pans when cooking” were the actions with the biggest differences between the first and the last conducted survey, +13% increase respectively, followed by “Open windows to cool down instead of using a cooling device” (+10% increase). The findings also showed that by the end of the evaluation period all actions were considered helpful in energy saving by at least +7% more respondents compared to the beginning.

## 5.2. Frequency of Energy Saving Actions

Respondents were asked to rate the frequency of a number of energy saving actions they perform, on a scale of 1 to 5. The higher the mean value (M), the higher the frequency of the action performed. The results are illustrated in Figure 2.



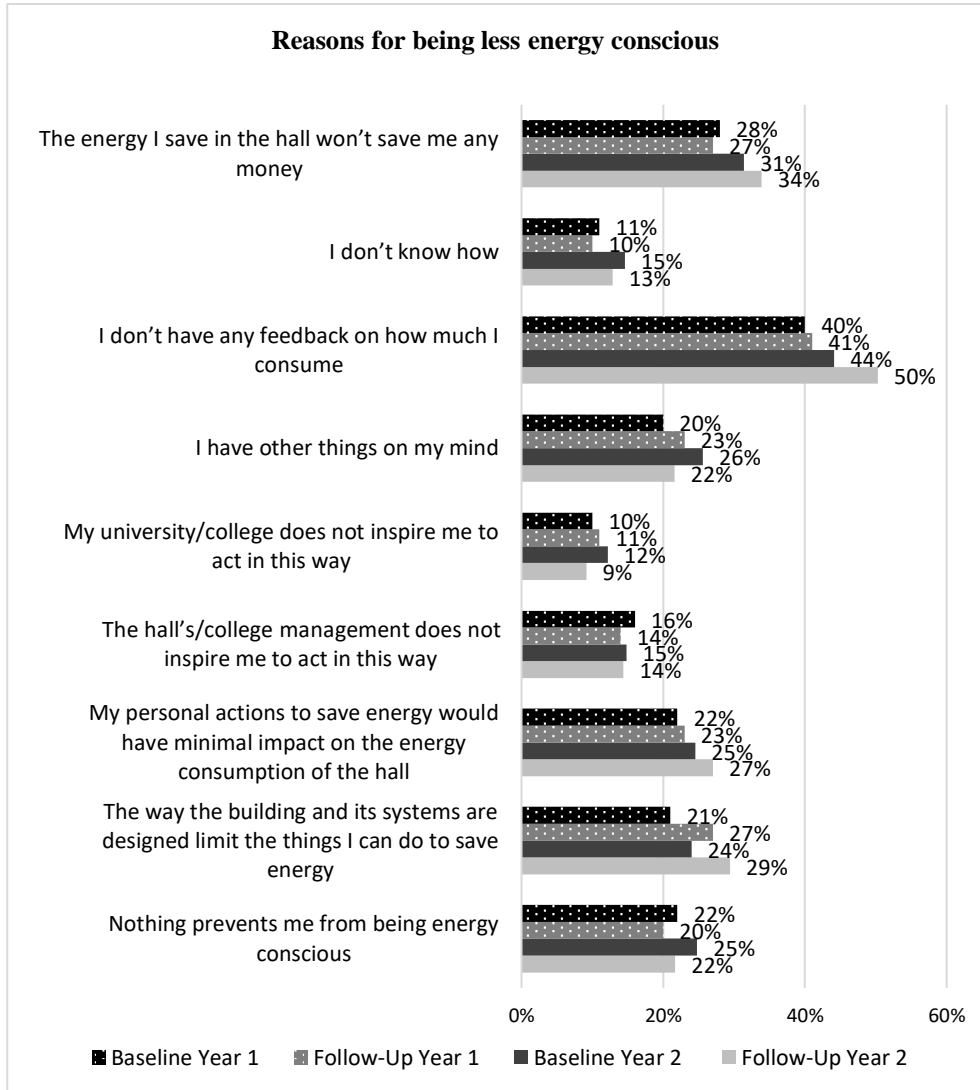
**Figure 2. Frequency of energy saving actions**

Source: Authors' own contribution.

By the end of the evaluation period (Year 2 follow-up survey) respondents undertook the following actions more frequently: “Switch off lights in empty rooms”, (+2% increase) “Boil the kettle only with the amount of water you intend to use”, (+2% increase) and “Put a jumper or an extra blanket instead of turning on the heating” (+5% increase). On the other hand, the actions, “Avoid leaving electronic equipment on stand-by” (-1% decrease) and “Put a lid on the pan when cooking” (-1% decrease) were slightly less frequently undertaken by the end of the evaluation period, while the action “Open windows to cool down instead of using a cooling device or a system” was undertaken almost as frequently as in the beginning with a minor decrease of -0.2%.

### 5.3. Barriers to Energy Saving Behaviour

Respondents were asked to select the three most important reasons that prevent them from being more conscious about their energy use from a list provided to them. The results are illustrated in Figure 3.



**Figure 3. Reasons for students to be less energy conscious**

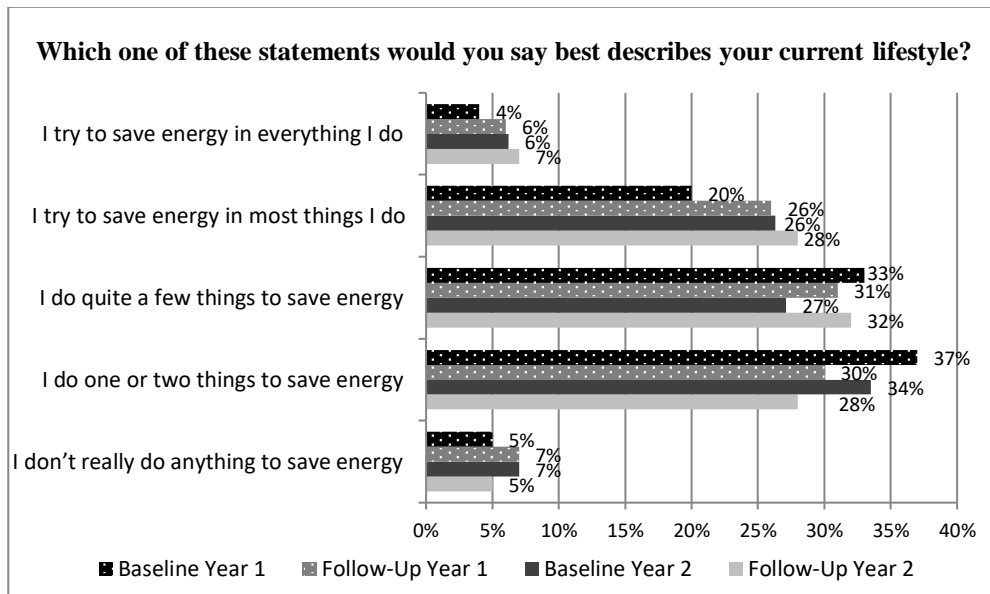
Source: Authors' own contribution.

Between the baseline survey of Year 1 and the follow-up survey of Year 2, the biggest observed differences are the following: A higher share of student respondents (+10%) replied that not having any feedback on the amount of energy they consumed was a barrier that prevented them from being more energy conscious, while +8%

more student respondents showcased the role a building's poor design play as a limiting factor towards higher levels of energy consciousness. By the end of Year 2, +6% more respondents stated that the energy they save in their hall would not save them any money and this was a reason preventing them from being more energy conscious, whereas +5% more of those surveyed said that their personal actions to save energy would have minimal impact on the energy consumption of their hall. Interestingly, by the end of the second year, less students stated that their university/college or the hall's/college's management did not inspire them to act in an environmentally conscious way (-1% and -2% decrease respectively). This might be an indication of students' acknowledgement of their university's effort to inspire them to adopt positive environmental lifestyles with the deployment of the SSO campaign. Another interesting result is the consistently increased share of students who mentioned the lack of feedback on how much energy they consumed as a barrier on their path to adopt pro-environmental behaviours. This is possibly attributed to the fact that the SSO campaign's targeted messages to students that often check their energy consumption were well received and helped students to recognize the importance of feedback about energy use.

#### 5.4. Energy Lifestyles During the Evaluation Period

Students were asked to rate their energy saving effort in their everyday life out of a predefined list of options. Findings are illustrated in Figure 4.



**Figure 4. Students' energy saving efforts during 2018-2020**

Source: Authors' own contribution.



The findings have revealed that at the end of the evaluation period (follow-up questionnaire 2020) a higher share of students compared to the beginning (baseline 2018) tried to save energy in everything they did (+2%), whereas this share was constantly on the rise during the three subsequent surveys. Interestingly, the biggest differences (-9% decrease and +8% increase) were observed with regard to the options “I do one or two things to save energy” and “I try to save energy in most things I do”, respectively. The percentage of those who stated “I do quite a few things to save energy” (no difference) and “I don’t really do anything to save energy” (-1% decrease) remained almost stable between the beginning and the end of the evaluation period although some differences were observed in the two middle-term surveys. Overall, the findings from this question might be an indication of the SSO campaign’s effectiveness in encouraging students to enhance their efforts towards energy saving actions.

## **6. Conclusions**

To capture the behaviour change in students, four rounds of survey questionnaires were circulated during the 2018-20 academic years; one at the start (baseline survey) and one at the end (follow-up survey) of each year. In total, more than 9,000 students living in halls of residence, answered the questionnaires. Although the 15% targets per survey were not met, this work is among the largest relevant academic works targeting students as a social group. The below-target participation might be attributed to i) the inability to get an all student email sent in some cases, as was the case in Year 2 follow up survey due to the COVID-19 pandemic and other emails being prioritized (i.e., for their studies moving online) and ii) the fact that no hardcopies of the surveys were used in some universities taking part in the SSO campaign, an effective tool to increase the number of participants, as it was the case in some other universities.

The findings show signs of a positive impact of the SSO campaign on students, with higher shares of students adopting pro-environmental behaviours by the end of the evaluation period compared to the beginning. In addition, a higher share of students increased their efforts to save energy, while students also showed a better understanding of the barriers that prevented them from undertaking energy saving actions. Findings also show growing interest and concern among the student population about the climate and ecological crisis.

In terms of limitations, campaigns like SSO can seem a bit too narrow for student activists, with a focus on energy only, therefore, to encourage further student participation and to increase their impact in the community, campaigns should be framed around climate action. Actions could be wider, not solely focusing on energy use, but on waste and water, as well, thinking about whole systems change in the wider society and about climate justice. The campaign could link directly with on-going world events & news (e.g. United Nation’s Conference of the Parties), to make it more timely, and give students the sense of urgency and of the fact that they are part of a wider solution and campaign.

As this study confirms, energy saving campaigns are an important element to support energy efficiency and energy savings. Therefore, it is recommended to higher education institutions, policy makers, and other relevant stakeholders and parties, to take appropriate measures to promote and facilitate efficient use of energy to domestic customers, such as students, in order to better shape the European internal energy market and to protect the environment from the adverse effects of carbon emissions.

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