energyXchange

Intelligent Energy Europe

STUDENT POWER

Pilot scheme and report on findings

Energy awareness projects delivered by students in four EU countries, and supported by:

CONSULTECO

TIPPERARY energy AGENCY

argem Agencia de Gestión de Energía de la Región de Murcia

FAEN Fundación Asturiana de la Energía

SOCIĀLĀS EKONOMIKAS FONDS

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INTRODUCTION

Student Power is an innovative scheme designed to facilitate students (on business/marketing and other courses) to provide practical support to organisations running energy awareness campaigns, including energy saving campaigns within their own universities or colleges.

The aim is for students to work with local businesses, organisations or their own university on energy awareness campaigns. Students are supervised by a member of the academic staff, the activity contributes to their coursework and the host business/organisation receives dedicated support.

BACKGROUND

A group of universities/institutes in the participating countries (Spain, Ireland and Latvia) were selected to run the Student Power scheme on a pilot basis.

The energy agencies in each country agreed the framework for implementing Student Power with the university/college, including academic assessment criteria for projects.

Host organisations for implementing energy awareness initiatives were also identified, and received free assistance on their energy campaigns.

Energy awareness projects were identified through consultation between students, academics, the energy agency and host organisations.

The students worked on the energy awareness initiatives supervised by academics, with advice and support from the energy agencies.

IMPLEMENTATION OF STUDENT POWER

THE POLYTECHNIC UNIVERSITY OF CARTAGENA, MURCIA, SPAIN

ABOUT THE UNIVERSITY

The Polytechnic University of Cartagena (UPCT) has a population of 7184 people between students, academics and staff. The Student Power campaign was implemented throughout the University, but the campaign was developed in the main building of the University, the Marine's Hospital building, in which the schools of Industrial engineering, mechanical engineering, chemical engineering, electrical and electronic engineering are located. The university was supported by the Agencia de Gestión de Energia de la Region de Murcia (ARGEM) in the implementation of Student Power.

IMPLEMENTATION OF THE SCHEME

The following approach was used to implement Student Power:

1. Collect data on the Polytechnic University population, energy consumption and financial cost.

   At the beginning of the project in 2008 the energy and water consumption of the university was:

Utility	Consumption	Cost
Water	26 214 m^3	€ 61 363
Gas	87 567 m^3	€ 38 566
Electricity	6 759 912 kWh	€ 767 181

2. Appoint a manager in the university to develop the actions with students before the campaign.

   An academic from the Marketing Department was involved in the campaign's implementation, and he developed a survey for completion by students.

3. Survey of knowledge on energy among students and how a campaign should be developed to motivate them.

   The survey sought to identify how a campaign on energy efficiency should be developed in order to maximise the impact on the students.

   The results of the survey were:

- The campaign should to raise awareness about: turning off lights during the day; use of natural lighting; taking a shower instead of a bath; use of solar energy; use of lighting sensors to switch on/off lights automatically; watering the grass with waste water, carrying out maintenance of electrical equipment; buying new electrical equipment with high energy efficiency (Energy Star or other label); unplugging devices that are not in use; giving lessons to people on how they can save energy.

- The most appropriate media and materials for a campaign identified from the survey were identified as:

  Posters Email UPCT Web
  Internet Comics

- The campaign messages identified from the survey were:

  Do it for you
  Future
  Hope
  Save to win
  Concern about tomorrow

- The images for use in a campaign identified from the survey were:

  Images of desert scenes
  Images of students from the university
  Comic with superheroes
  Sensual scenes
  Chaotic images

4. Pre-Design of the communication campaign with students.

   With the results of the survey a group of students, professors and staff of the university developed the final format for the campaign.

5. Final design of the communication campaign with a publicity company.

   The campaign strategy was sent to a publicity company to develop the images and print them in the form of fliers, posters and other formats.

6. Run campaign to motivate the students, academics and staff.

   The campaign was implemented, posters were placed on the walls of the main building, fliers were distributed, information stands were erected in the main entrance of the university with a wide range of information and volunteers visited each classroom at the end of the classes to explain the project, provide advice and hand out promotional campaign merchandise.

7. Survey of knowledge in energy and habits of energy consumption.

   After the campaign a survey of energy habits and knowledge in energy was carried out among the population of the University. The results showed that people had a greater knowledge of RES and efficiency energy as compared with when the project start:

   ✓ 83% knew the meaning of energy efficiency.
   ✓ 77% changed some lighting at home for low consumption bulbs, LEDs or similar.
   ✓ 58% switch off lights when they go out the room.
   ✓ 7% placed controls on lights at home.
   ✓ 73% are aware of energy labelling in electronic devices.
   ✓ 65% knew the correct temperature for air conditioning.
   ✓ 43% installed WC tanks of average download at home.
   ✓ 22% installed systems to reduce pressure at taps water.

RESULTS

The University measured the energy consumption at the end of the campaign and ARGEM extrapolated the quantities to take into account the increase in population of UPCT of 33% during the period of the campaign. The following results were achieved:

Utility	Consumption	Consumption extrapolated	Change in consumption
Water	32 859 m^3	34 865 m^3	2 006 m^3
Gas	69 814 m^3	116 464 m^3	46 645 m^3
Electricity	7 508 080 kWh	8.990.683 kWh	1 482 603 kWh

The savings were calculated by comparing the consumption between 2007 and the consumption in 2009, and extrapolated to allow for the increase in the population of the University over the period.

The main result of the Student Power campaign in UPCT was a saving 1482 MWh in electricity, a reduction in gas consumption of 46 645 m3 and a reduction in water consumption of 2 006 m3.

THE UNIVERSITY OF OVIEDO, ASTURIAS, SPAIN

ABOUT THE UNIVERSITY

The University of Oviedo is the University of the Principality of Asturias. It offers studies in Engineering, Business and other disciplines, and in 2006 had a population over 29.886 people between students, professors and staff. The implementation of student power was carried out with the students form the Faculty of Economic and Business Sciences and the campaign was realized in the main building of that faculty. The university was supported by the Fundación Asturiana de la Energía (FAEN) in the implementation of Student Power.

IMPLEMENTATION OF THE SCHEME

The directors and other staff of the relevant schools of Engineering, Economics and Psychology in the university were initially contacted to further develop their expressions of interest in the original project proposal.

Meetings were held with various Department Heads, and agreement was reached with the Department of Business Administration and Accounting. Mª Begoña Álvarez, Lecturer in Business Administration and Management of the Department of Business Administration and Accounting agreed to implement the scheme.

FAEN carried out ongoing meetings with the university with the aim developing a Collaboration Agreement and seeking ways of providing incentives to students.

The Faculty provided 2008 consumption data for water and energy, which was analysed by FAEN.

Utility	Consumption	Cost
Electricity	943 189 kWh	€ 133 648
Water	45 554 m^3	€ 61 034

The Student Power campaign was implemented in three strategic phases:

1. A pre-campaign survey sought to identify energy attitude and behaviour and collect information for designing the campaign.
2. Design and implementation of the campaign was then carried out.
3. A final qualitative vs. quantitative study to attain the results of the campaign was conducted.

PRE-CAMPAIGN SURVEY

This survey aimed to identify the existing situation and provide a solid base for the preparation of the campaign design. The survey consisted of a quantitative study of energy consumption,

habits, energy saving advice required, and other campaigns realised.

The survey was divided into the following main parts:

1. Home energy equipment related to energy consumption and habits.
2. Energy consumption in the University.
3. Recycling habits, attitude about transport and driving.
4. Opinions on the responsible use of energy and associated motivation.

Different sample populations were targeted:

1. Students from the Economics Faculty of the University of Oviedo in the Campus Cristo.
2. Academics and other university personnel from the Faculty of Economics in the Campus Cristo.

A total of 400 students and 50 academics and other personnel completed the questionnaire.

DESIGN OF THE CAMPAIGN

The information collected from the first steps and the survey, provided sufficient input to begin the communication campaign design in the Faculty of Economic and Business Sciences, Campus Cristo. The awareness campaign proposed had the objective of changing energy use behaviour.

Messages and images used in the campaign included a light bulb and a water drop character were the core images used in the campaign.

The students choose a light bulb as it was easier to include a message with it than with any other item of electrical equipment.

The same philosophy applied to water consumption. A ‘happy’ water drop was used when referring water consumption.

The images also enabled the students to communicate in a language similar to that of their studies (economics).

Using this idea, a poster was developed using the concept of ‘equations’, the first one added negative habits together, obtaining as a result a “dirty world”, and a second one added good habits together with the result of a “clean world”.

The main communication routes included:

- Exhibition of posters with different messages.
- Distribution of fliers and information material.
- Info Point prepared by students.
- Short talks and direct communication from volunteer students to fellow students, teachers and personnel from the Faculty.
- Other communication sources such as rollers, folders, stickers, rulers and doorknob hangers.

POST-CAMPAIGN SURVEY

A follow-up survey was carried out to determine whether a change in energy awareness and habits had been achieved.

A new quantitative study was realised with a similar sample to the first one, targeting academics, personnel and students from the Faculty of Economics of the Campus Cristo.

The survey was divided into five main topics:

1. Awareness of the campaign development
2. Pre-, post- and future attitude about energy consumption at home and in the Faculty
3. Recycling habits before and after the campaign and future forecast
4. Habits and attitudes about transport and driving
5. Motivation of the campaign and influence related to energy consumption and savings questions

A total of 346 students and 34 academics and personnel completed the follow-up questionnaire.

RESULTS

Data collected from the energy consumption in the Faculty of Economics, before and after the Student Power Campaign was:

	Electricity consumption (kWh)	Electricity cost (€)
2008	943 189	133 648
2009	933 128	130 638
Savings	10 061	3010
% saving	↓ 1,07%	↓ 2,25%

	Water consumption (m3)	Water cost (€)
2008	45 554	61 034
2009	44 627	59 792
Savings	927	1 242
% saving	↓ 2,03%	↓ 2,03%
TOTAL utility savings		**€4 252**

- The energy saved in 2009 was 1.07% in electricity consumption and 2.03% saving in water consumption.
- The financial saving achieved in the year 2009 was € 4 252.

These results demonstrate a successful reduction in the energy consumption, although by a modest level; it can be concluded that this was as a result of the change in behaviour of the target population who followed the campaign and used the advice given.

PROFILES OF THOSE WITH GREATEST AWARENESS ON ENERGY SAVING

For the two kind of samples (students and teachers and personnel), the more respondents with greatest energy awareness were those within a family unit and with the family head having university education or other tertiary studies. Families with secondary level studies appeared to have less interest in responsible energy use.

Related to gender, results showed that women have greater predisposition for energy saving, and also the younger the person is, better habits were found and a greater willingness to improve energy consumption habits.

Around 40% of the two samples said that they were motivated by the marketing campaign carried out in the Faculty, and also believed that the campaign was interesting for others within the Faculty. This finding shows a positive reaction to the campaign with almost half of the interviewees having thought about the rational consumption of energy and changed their habits or plan to change in a future.

ENERGY SAVING HABITS AND COMPARISON BETWEEN STUDENTS AND ACADEMICS AND PERSONNEL

The most positive behaviour on energy was in relation to lighting (most of the related questions has favourable percentages from 60% to 80%), followed by positive attitudes about water and electrical equipment, and finally attitudes related to computer equipment.

It is necessary to highlight the difference between habits at home and at the University, because for the same action, usually the attitude is worse in the Faculty than at home.

In relation to recycling there is some need to improve on recycling of some materials such as medicines, clothes and electrical appliances.

Attitudes towards sustainable transport were more negative. More than half of the respondents do not see any satisfactory alternatives to the use of the private car, as it is more comfortable for their trips and they are not interested in car sharing or other means of transport. They believe that sharing a car curtails their freedom.

Essentially energy consumption habits are very similar between students and personnel of the University. The differences are more related to the way of life and the perception. For example, students are not responsible for energy bills at home so they don't see how much it costs.

CAMPAIGN RECEPTION WITHIN THE TARGET MARKET

The materials distributed during the campaign were very useful as reminders to perform energy saving actions. It is therefore expected that the materials such as folders, rulers and door-knob hangers will continue to transmit the energy saving message.

In general, the campaign has been valued positively by the target market, because more than half think that it had an effect on them and on others. The data obtained shows that most of the respondents think that the campaign was very satisfactory.

Ideas to apply in future campaigns:

- Search for alternatives to printed information dissemination methods, e.g. e-mails, radio, TV, etc.
- Organisation of talks from organisations and institutions (by experts on energy consumption with clear and practical advice).
- Present energy savings as financial savings, so that the target public perceive energy saving as personal profit.

THE TIPPERARY INSTITUTE, TIPPERARY, IRELAND

ABOUT THE INSTITUTE

The Tipperary Institute (TI) implemented the scheme in Ireland. TI is a development and research centre established by the government of Ireland, created in 1999, and now has over 800 students located on two sites. The Institute is unique in Europe in its integration of higher education with rural community and business development programmes. The Student Power campaign was implemented by the students of the second year of Environmental and Natural Resources Management degree in the Thurles campus.

The Institute was supported by the Tipperary Energy Agency in the implementation of Student Power.

IMPLEMENTATION OF THE SCHEME

Second year Environmental and Natural Resource Management degree students were identified as an appropriate student group to collaborate under the Student Power scheme. In order that the students 'own' the campaign it was decided that they should identify their own conservation campaign. In doing so, one half of the class decided to launch a paper conservation campaign while the other half focussed on reducing standby in PCs and VDUs.

The students aspired to complete their campaigns by means of feedback in a mutually reinforcing pattern, through the application of IMAM:

- Identification
- Measurement
- Awareness
- Measurement

Objectives of the paper and energy conservation campaigns were:

- To tailor awareness among students with regards their paper consumption and use of PCs.
- To reduce paper usage in the Knowledge Resource Centre (KRC) and reduce energy use of PCs.
- To assess the attitude and behaviour of students regarding their use of paper in college.
- To motivate change amongst students both on campus and in their extracurricular lives.
- To carry out a successful campaign through collaboration as a group.

The student groups identified the key individuals to approach within the Institute regarding the waste management campaign, in order to establish a good working rapport and gain the positive support of senior management, facilities and the administration staff.

Meetings were held in order to achieve the following:

- Signing of a pledge of support from TI management.
- Establish baseline PC and paper use in the Thurles campus.

- Approval of the awareness material that would be posted within the campus building.
- Acquisition of a notice board for the placement of awareness material.
- To seek permission to upload awareness material on the TI Website homepage.

The following approach was followed:

1. A baseline for annual paper usage in the KRC was established.

2. An initial survey was carried out to assess the students' attitudes to paper consumption.

3. PC use was monitored in computer rooms.

4. TEA developed and delivered six Energy Management lectures to degree students and these lectures informed and enabled the students to shape their conservation campaigns.

5. Plans for the conservation campaign were developed with the focus of encouraging students to print less and save reading materials to the Institute's electronic memory facility, as well as to adopt more efficient means of printing.

   The slogan for the campaign was:

   "*Have you forgotten where paper comes from? Simply print less!*" and
   "*Save and read, don't print and read*".

   A Conservation Week helped launch the awareness campaigns.

6. A double sided printer was installed in the library and instructions were made available. The printing cost structure was modified to make it beneficial for double sided copying and printing.

7. Campaign material was circulated and posted. A notice board, near the main canteen, reminded college users of the project, its aims and its impacts.

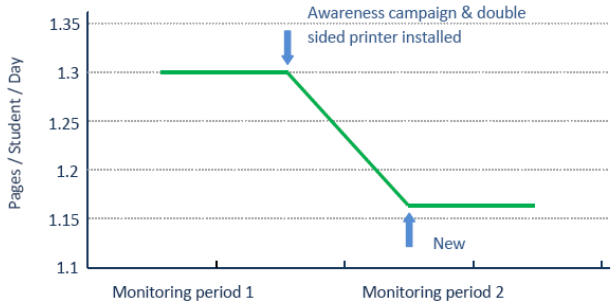
8. Ongoing surveys were carried to assess the impact and monitor any change in the attitudes and behaviour of the students and to assess if this impacted on the paper and PC usage.

9. Results were analysed and a new baseline for annual paper usage was extrapolated from the available figures, and results compared.

10. Changes in the use of PCs were recorded.

RESULTS

The results of the Paper campaign are indicated in the following graph:



The students were successful in reducing the amount of paper consumed by each student, with a reduction in Pages/Student/Day from 1.3 to 1.17. On an annual basis this equals 7,254 sheets, or a 4% reduction in total paper use. The final survey found that 54% of students surveyed had changed their behaviour to use paper more efficiently.

For the energy saving campaign, the group monitored the closing down of PCs and VDUs once daily and found that 25% and 50% of VDUs and PCs were left on respectively. From monitoring of the use of PCs and VDUs, one of the computer rooms showed an improvement from before to after, but for others no reduction was achieved. However, the students made further proposals to achieve better results in the future.

The TEA lectures are now embedded in course material for the benefit of future degree students embarking on conservation campaigns. The initiative taken by the students has also evolved into the development of a Green Society within TI which will link directly to the TI Energy Management Committee. The TI Energy Management Committee has been

established by TI management. This initiative and the benefits listed above provide continual means of generating new annual campaigns with fresh ideas as new students get involved each year. Significantly the campaigns provided a baseline, from which future work can continue, where previously none existed.

RIGA TECHNICAL UNIVERSITY, LATVIA

ABOUT THE UNIVERSITY

The Riga Technical University (RTU) implemented the scheme in Latvia. The RTU comprises 8 faculties: Architecture and Urban Planning, Building and Civil Engineering, Computer Science and Information Technology, Electronics and Telecommunications, Power and Electrical Engineering, Engineering Economics, Materials Science and Applied Chemistry, and Transport and Mechanical Engineering. More than 16,000 students study in Riga Technical University and it has an academic staff of 636.

The Student Power scheme was implemented by the Institute of Heat, Gas and Water technology (IHGWT). The institute is part of the Faculty of Civil Engineering at Riga Technical University. The IHGWT institute is the only governmental institution in the country that provides all levels of higher education and carries out research in the field of heat, ventilation and water technology.

The Institute was supported by the Social Economy Fund in the implementation of Student Power.

IMPLEMENTATION OF THE SCHEME

With a large proportion of the residential buildings around Riga having older heating technologies and in many cases poor levels of thermal insulation, the IHGWT Faculty staff saw the opportunities presented by the Student Power proposal to reduce energy and water usage and related costs for building users. The aim was for students to carry out energy audits of buildings and identify opportunities for reducing energy use. The project also provided practical coursework for technical students in carrying out the audits and in presenting their findings.

Energy saving in residential buildings (particularly in multi-apartment blocks in big Latvian cities) has become a very important item for Latvia – especially during the last years along with growing energy bills and economic/financial difficulties. Residential sector takes the largest share in final energy consumption – up to 35 %.As long as most multi-apartment residential buildings were built in 60s – 80s of the 20th century the first step to provide energy saving measures is energy audit.

This included examining the energy consumption for the heating and ventilating equipment and systems, checking electrical loads, checking for areas of inefficiency or where less energy could be used, and identifying the opportunities for improvement. The students developed appropriate measures of energy efficiency for the tenants and owners/managers and delivered Student Power in local housing communities through:

The following approach was used to implement the Student Power scheme:

1. Education

RTU educate students, that students will be ready performing energy audit in buildings. In education process are included following lectures:

- Engineering systems and utilities;
- Energy audit process and calculation methodology;
- Economic calculations;
- Energy efficiency measures and calculation process;
- Practical training.

Thirty students attended the course on the Student Power scheme implementation: comprising of 3rd – 4th year bachelor students and 1st year master degree students.

2. Choice of object

The students were offered a free choice of energy audit objects. Students could choose any residential buildings – multifamily or one family building.

3. Meeting with building owner or manager

The next task for students was to meet with the building owner or manager and explain the aims of the energy audit and the

possibilities for energy efficiency in building.

4. Inspection of building and collection information

In carrying out the energy audit reports, students inspected the buildings – checking building utilities, building envelope and inspecting microclimate in rooms. The next important task the collection of all information on energy consumption of building – heat, electricity and hot water consumption.

5. Develop measures of energy efficiency

After inspection and collection of information, the students developed different energy efficiency opportunities for the building. These measures were very important for the inhabitants of the building in understanding technical problems and finding solutions for energy efficiency in the building.

6. Energy audit report

Energy audit reports were then developed by the students. The report outlined:

- The objectives and scope of the audit;
- Description of the characteristics and operational conditions of the building and equipment/systems audited;
- Findings of the audit;
- Corresponding savings and implementation costs, recommendations and any other follow-up actions.

7. Inspection and checking of energy audit report

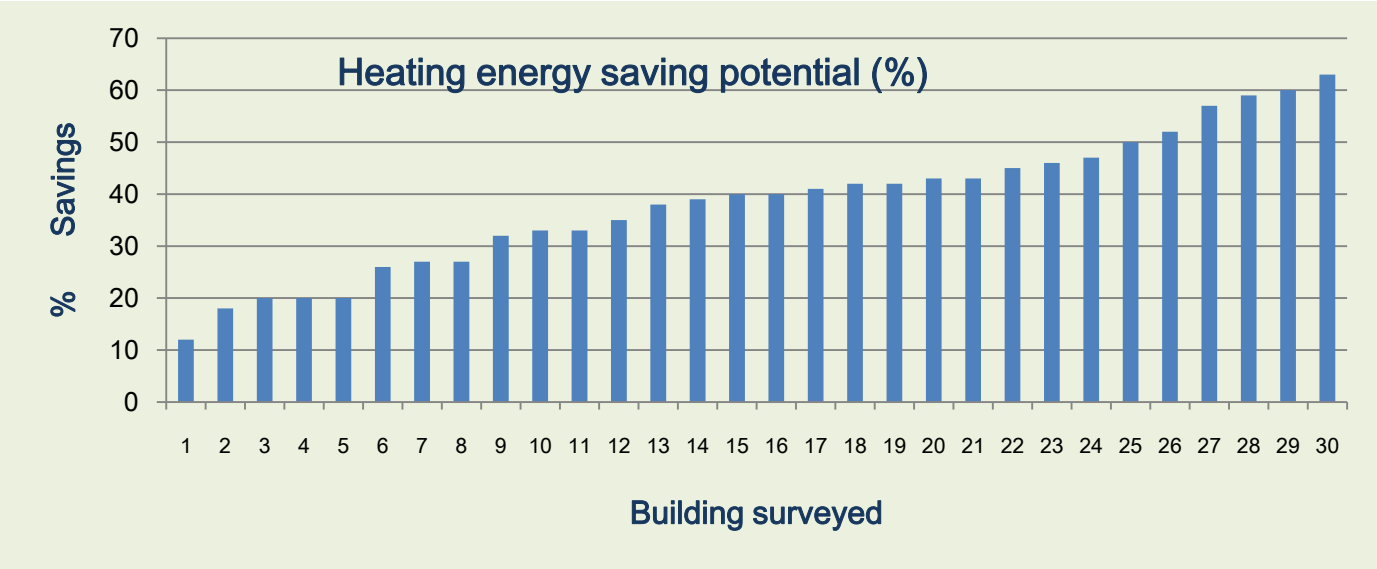
The academic staff of Riga Technical University reviewed the energy audit report and suggested improvements. The students made presentations to the building occupants and showed them how energy savings could be made.

8. Management

After receiving all reports, the academic staff of Riga Technical University processed all reports and prepared the final report.

RESULTS

The students identified the following energy savings:



Energy savings identified by RTU students in buildings surveyed:

Building location	Potential reduction of heating energy consumption from recommendations, %	Building location	Potential reduction of heating energy consumption from recommendations, %
Vecdumbraju iela, Riga	27	Jana iela 4, Cesis	33
Strautu iela 19, Daugavpils	47	Saulgozhu iela 6, Riga	33
Tautas iela 30, Daugavpils	42	Cirulju iela 131, Jurmala	46
Sunishi, Garkalne region	20	Ranka dambis 7/1, Riga	63
Lauku iela 4, Druva, Saldus region	18	Dzirciema iela 5, Riga	41
Sila iela 19, Riga	32	Dzenju iela 9, Riga	27
Emmas iela 19, Riga	39	Emmas iela 10a, Riga	42
A. Dombrovska iela 49, Riga	40	Bruninieku iela 57, Riga	57
Balozhu iela 4, Ventspils	26	Zemenju iela 6, Ogre	12
A. Dombrovska iela 33, Riga	45	Miera iela 7, Ventspils	20
Atlantijas iela 12, Riga	38	Limbazhu iela 1/1, Riga	59
Malienas iela 74, Riga	40	Stamerienas iela 2, Riga	43
A. Jullas iela 13, Liepas pagasts, Priekuli region	50	Liela iela 59, Riga	60
Rostokas iela 34, Riga	43	Zirnju iela 3, Riga	52
Bikernieku iela 126 K-3, Riga	35	Muzeja iela 10, Daugavpils	20

DISCLAIMER

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