JEG'S ENERGY ACTION PLAN

N.DELIVERABLE D.T4.3.1.

Second Part –Jeg's Energy Action Plan

11 2018

Edited by PP6 UNIBO

Developed by: PP8 Újszilvás

Subject: Tápiószőlős – Újszilvás Calvinistic Primary School and Kindergarten - It is a member institution of Újszilvás (HU-2768 Újszilvás, Alkotmány str. 73.)

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1. THE AIM OF THIS GUIDE

E @ S is a European project, aimed at effectively reducing the excessive waste of electricity and, above all, raising awareness on the topics of energy sustainability students, teachers, non teaching staff, as well as parents and therefore citizens.

This small guide was created to spread the action of energy saving in other schools and homes, describing principles and methods, providing useful advice to address any obstacles to achieving goals and to adapt the action in different school contexts, through different examples practical.

Schools today have the fundamental task of being motors of the change of course of our society towards a sustainable future, reorganizing society so that it is able on the one hand to use renewable energy resources, on the other to recycle material resources non renewable. This means changing the behaviour of individuals and communities, so that everyone shares this need through daily action.

In the proposed path the knowledge comes after the actions, so that at every step the knowledge is integrated with the actions, supporting the ability of each individual and community to re-direct their daily actions towards sustainability, already from the moment here I'm.

It is a process of co-education, in which the elements of knowledge connected to it are first of all activated by living the experience itself. Furthermore, the teachers of the different disciplines can take back what they have experienced, to develop theoretical insights from the context of experience.

Another important objective of the educational action is to encourage the development of future citizens aware not only of their being individuals, but alsopart of the community, of the nation, of our planet, thus learning to take care of the common good as their individual good.

This document aims to prepare a training exercise focused on the energy culture in order to develop the Energy Culture Action Planof the JEGs. The structure of the document was created to assist JEGs through simple technical notions during the different phases:

1. INVENTORY -Junior Energy Guardians are involved in the audit process as it is a significant learning opportunity. They have to do the check up of the school in order to determine how the energy is used in the school, measuring the energy use of specific electric items.
2. ELABORATION –The data from inventory will be elaborated and discussed between SEGs and JEGs in order to select the classrooms and common rooms having the highest energy consumptions. The energy consumptions in the classrooms or common rooms are strictly linked to the presence of persons and to the temperature for a right comfort. JEGs have to organize the monitoring of the school using the specific template in order to realize the basic energy consumption profile;
3. ORGANIZATION –JEGs will elaborate a specific map of the entire school complex in which will be evidenced the individual classrooms chosen to be monitored;
4. CREATE AN ACTION PLAN –The action plan consist of a set of goals/activities for improving energy efficiency.

   Each school can establish a portfolio of energy efficiency goals based on the indications by the ENERGY@SCHOOL technical audits. Assessing potential energy savings helps determine an appropriate portfolio of goals that are clear and measurable. Each school has to establish both short-term and long-term goals for improving energy efficiency.

A regularly updated action plan is a necessary roadmap toward meeting portfolio-wide energy efficiency goals. Create an action plan, involves establishing energy performance targets based on the energy consumption inventory.

The ENERGY@SCHOOL guidelines for the Energy Smart School Management Plan presenta seven-step approach:

2. THE PRINCIPLES OF SUSTAINABLE ENERGY

Energy saving, together with the use of renewable energy sources, are the only two paths for the development and maintenance of sustainable energy, or better, of a condition of acceptable energy and environmental sustainability, to contain the current climate changes.

All renewable sources are reconstituted in a time comparable with the time necessary for their consumption and therefore can be considered inexhaustible. They derive directly from the sun, from wind (wind energy), from biomass, from tides (tidal energy), from water (hydroelectric energy) and from geosphere (geothermal energy), do not affect natural resources for future generations and do not involve increase in CO2.

Energy savings can instead be considered "virtually" as the first source of renewable energy, the most immediate and accessible to all. With small actions, for example by turning off the lights turned on unnecessarily, and even minimal investments, it is possible to make all the places where you live energy efficient (homes, offices, schools, etc.) and reduce your energy consumption, saving money economically and efficiently. avoiding the production of polluting and climate-changing gases.

FOR EXAMPLE:

- "A 10% REDUCTION IN ELECTRICITY CONSUMPTION" WHAT DOES IT MEANS?
- Assuming that the sum of the electric consumptions taken from the inventory of all the classrooms of a school, consist of 130,000 kWh, a 10% reduction in consumption means:
- • annual electricity savings of 13,000 kWh / year = (130,000 kWh / year x 10) / 100;
- • annual economic savings of € 2,600 / year = 13,000 kWh / year x € 0.26 / kWh (for example, taking the average annual price of electricity € 0.26 per kWh)
- • CO2 reduction of 7,540 kg CO2 / year = 13,000 kWh / year x 0.58 kg / kWh (assuming an emission of 0.58 kg of CO2 per kWh);
- • saving of non renewable resources (gas, oil, coal) equal to 3120 kg / year = 13,000 kWh / year x 0.24 kg (adopting as a quantity of non renewableresources consumed for every kWh the value of 0.24 kg).

It is essential to share with all the calculated values, for example creating a billboard, to be displayed in the school buildingin clearly visible points, where all the results obtained in terms of energy, environmental and economic savings are clearly indicated. Seeing the results achieved can be an incentive for the development of further commitments.

3. INVENTORY

Knowing where your school's energy comes from and how you use it is a crucial first step to understanding what changes can be made.

In each classroom and common space the JEGs should make the inventory of the equipment energy use. In fact, to become more energy efficient, it is important to know how energy is currently being used. The template 1assists schools to determine their energy use and type.

For the Inventory Template, is required to specify the devices present in each of the chosen classrooms, their power and duration of hourly operation per day

To insert on the Template 1, the energy absorption of the various devices, you can use an electronic device with a display, which is inserted between the socket of our appliance and the electrical outlet in the wall.

As soon as it is connected, the display shows the consumption in real time in Watt, in Ampere, the power peaks: the data are automatically saved to review them calmly. On some devices, it is possible to set the cost related to its range of use to directly view consumption expressed in Euros.

The electrical energy consumed in a building is expressed in kWh (kilowatt hours), a very widespread unit of energy, which corresponds to the energy used by a 1 kW power plant that remains in operation for a time now. The unit of measurement of energy in the international system is instead the Joule. The equivalence between the two units is 1 kWh = 3.6 MJ (millions of Joules). In this guide we always refer to the kWh, the unit of measure universally adopted in the electricity sector.

4. ELABORATION

Once all the inventories of the different classes of the school have been carried out, it will be necessary to proceed with the evaluation of the consumption expected for each of them. Will follow a comparison a comparison of all estimated total consumption in order to identify which, among the classes studied, results to have a greater consumption and therefore results to be an interesting class to be monitored in order to eventually reduce consumption, once implemented energy action plan in the final phase.

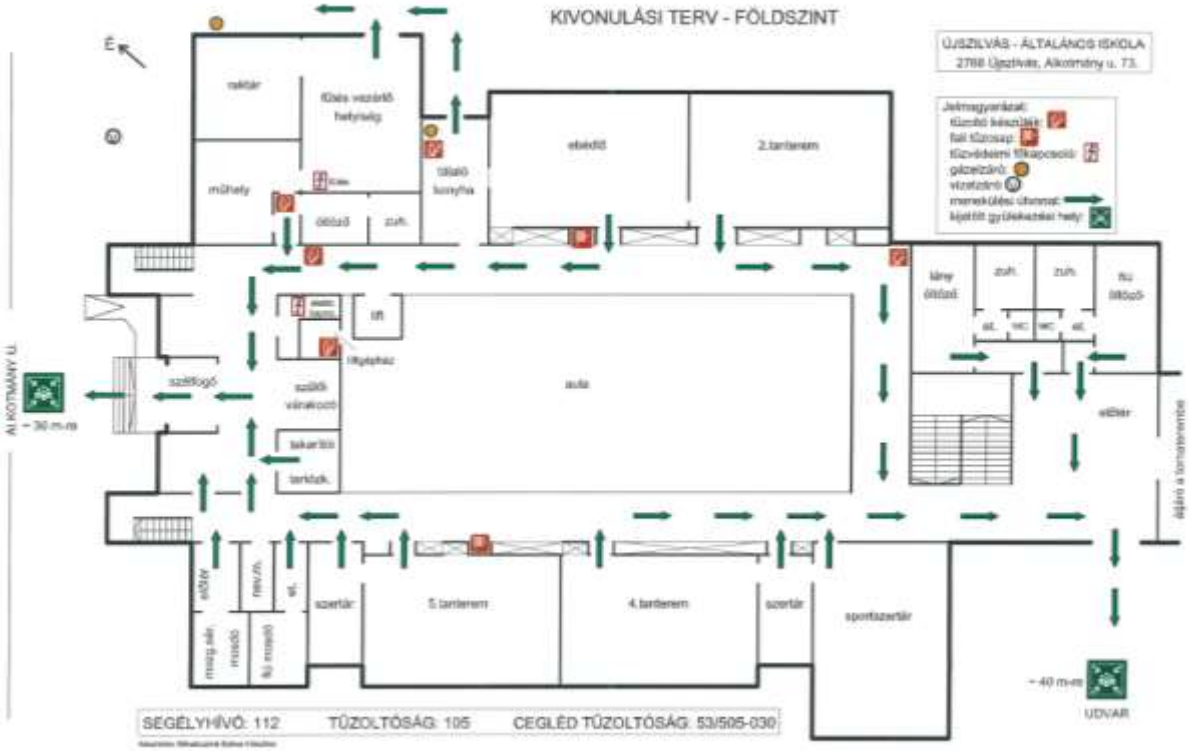
5. ORGAINIZATION: Maps of the Schools and rooms:

This step is necessary for a better understanding and possible verification of the consumptions detected, known that the structures detected and the plant components therein present.

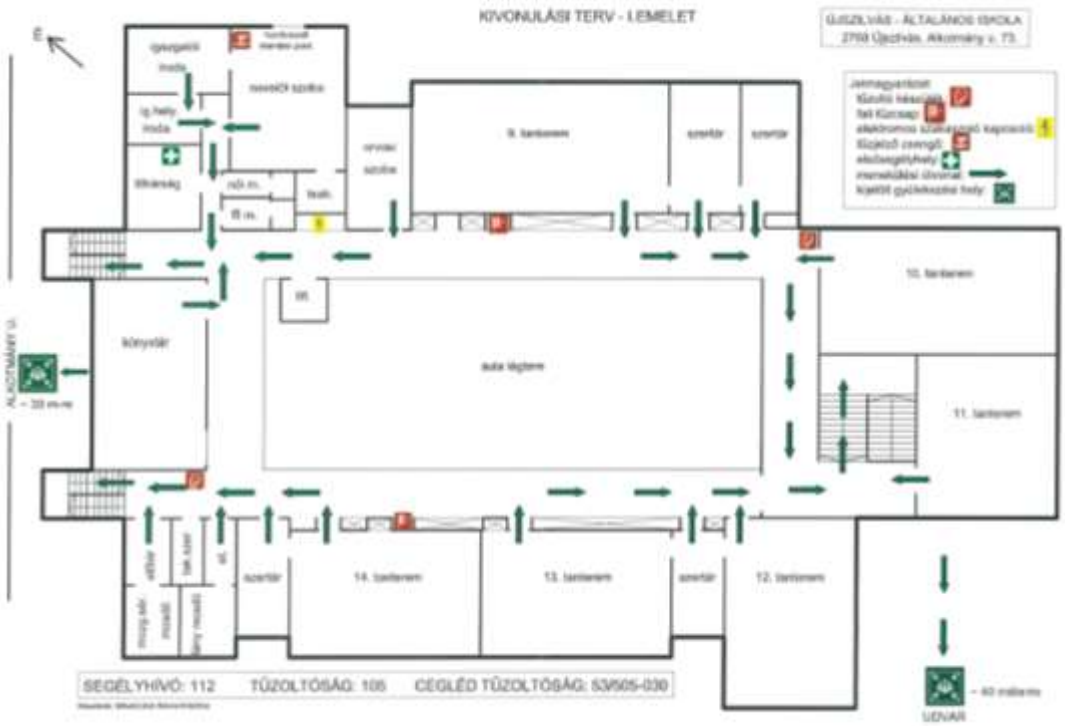
Therefore, the maps of the entire school structure are requested and the classes actually chosen for monitoring are highlighted. It is important to report the name or the identification of these spaces.

Maps of the School and rooms:

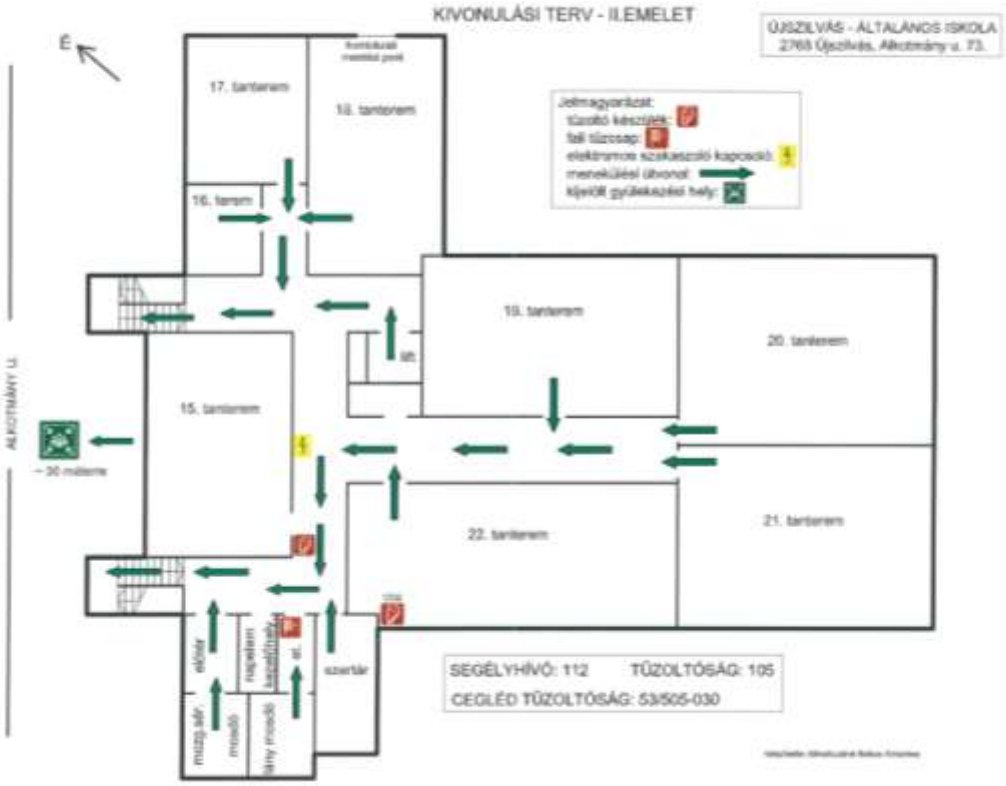
Ground floor



I. Floor


KIVONULÁSI TERV - I.EMELET
SEGÉLYHÍVÓ: 112
TŰZOLTÓSÁG: 105
CEGLÉD TŰZOLTÓSÁG: 53/505-030

II. Floor



Selected room: 2st floor: 21. classroom. Area Size: 60 m^2

Table1: Inventory template

SCHOOL:							
ROOM:		example name room					
Energy use	Details	How many	Load in working	Time on	Load in stand by	Time on	Use
			Watts	Hours per day	Watts	Hours per day	Kwh per day
Lighting	Lowenergy lamps						
	High energy lamps						
Equipment	Computers						
	Printers						
	Photocopies						
	Projectors						
	Whiteboards						
	Faxes						
	TVs						
	Video recorders						
	Speakers						
	Others(Power Tools, Fridges, Microwaves ...)						
TOTALE Kwh/ day:							
DATE:							
JEG:							

A sample day

School: Tápiószőlős - Újszilvás Calvinistic Primary School and Kindergarten - It is a member institution of Újszilvás (HU-2768 Újszilvás, Alkotmány str. 73.)							
Classroom: 21. room (Floor II)							
User	Details	How many	Load in working	Time on	Load in stand by	Time on	Use
			Watt	Hours per day	Watts	Hours per day	Kwh per day
Lighting	Lowenergy lamps	-					
	High energy lamps	12	36	6			2,592
Equipment	Computers	1	120	1,5	2	22,5	0,2475
	Printers	-					
	Photocopies	-					
	Projectors	1	35	1,5	2	22,5	0,12
	Whiteboards	-					
	Faxes	-					
	TVs	1	40	0,5	1	23,5	0,03175
	Video recorders	-					
	Speakers	-					
	Others (Power Tools, Fridges, Microwaves …)	-					
Totale: Kwh per day:							2,99125
Date: 23/11/2018							
JEG: Lénárt Lili							

6. Analysis and evaluation of the current school electrical system

Simultaneously with the start of the survey of energy consumption, for the compilation of the Inventory Template, the action continues with another cognitive phase aimed at identifying:

- management practices of the current school electrical system;
- useful changes for a sustainable management of the school electricity system;

Analysis of behavioral practices and not, currently adopted for the management of the school electrical system.

Identified and shared working methods and tools, the team of JEG's (Energy Guardians) comes into action analyzing and evaluating the current school electrical system. Each member of the team, equipped with the necessary for inspections, must, in a more or less technical way depending on the level of school, examine the school building considering the following aspects:

- styles of electricity consumption adopted by the school population, observing if there are any situations of energy waste (lights on in rooms where there is no one or where the natural light that enters from the windows is sufficient, the lights of the classrooms turned on before arrival of students, laboratory computers with standby on, photocopier on even if not used, gym lights constantly on, etc.) or if there are already good practices in place;
- sources of electricity consumption, wondering about the artificial lighting system (what light bulbs are installed? Are all neon lamps? In the classrooms you can turn off or turn on a single row of lights? How are the headlights of the gym? , after a while, they automatically turn off the lights? etc.) and on the electrical equipment present (how many computers are there ?, in the canteen there are fridges and dishwashers ?, etc.);
- factors of structural obstacle to the use of natural light and the saving of electricity (switches that do not differentiate the lighting of the lights in the classrooms, blackboards that reflect the natural light reducing the visibility of what is written, faulty shutters, lights of entire corridors controlled by a single switch, etc.);

7. Organization and start of the savings phase

From now on, in order for energy saving objectives to be pursued, it is absolutely necessary that the school population is informed and, consequently, committed to respecting the new protocols for the use of electricity. After a first "reserved" passage, in which the methods of application are specified among the organizers, the action becomes public and the phases, to be shared and implemented together with the entire school population, must be:

- presentation of the action to students, teachers, non-teaching staff and citizenship (what was done and what was planned);
- start and respect of the new rules for more sustainable use of electricity.

8. Finding ways to apply energy savings

The contact person / coordinator with the JEG's team and the persons in charge of energy consumption gather together and, based on the considerations contained in the report of the energy team, identify:

- objectives and new rules (protocols) to be applied to school for a more sustainable use of electricity;
- guardians of light (the name can also be different), that is to say the people who, in all the spaces of the schoolbuilding, will contribute to the application of the new sustainable electricity management rules paying attention to the evolution of the relationship between natural light and artificial light, and taking care of switching on and off switches and other electrical equipment. The guardians of light, like the other operating groups, must be motivated people, with the desire to change.

9. ENERGY ACTION PLAN FOR JEGS

Junior Energy Guardians will describe each action scoping to reduce the energy consumptions by the following scheme:

a) responsible for the action;
b) description of the action;
c) on which consumption falls: electrical or thermal

Action involves changing people practices and behaviour.
All the actions have to be reported in the following template:

JEGs ENERGY ACTION PLAN *(Please, make one for each action identified)*			
Responsible for the action	**Description of the action**	**On which consumption falls**	
		Electrical	**Electrical**

The energy action plan for JEGs will be focused on the reduction of un-systemic and non-systemic energy consumption.

Non-Systemic Energy Consumption:it is the energy that the school's staff uses directly for working. This consumption generates wasting energy if the school staff has not culture of energy efficiency for example turning equipment off when it is not in use (eg the computer monitor typically uses 67% of the total energy used by the computer system). Junior Energy Guardians should develop good housekeeping practise in their junior action plan using a simple-fix template of life style action to reduce the wasting energy.

Un-systemic Energy Consumption:it is the energy that depends on both systemic and non systemic energy consumptions for example lighting that is one of school's largest area of energy use. On a part, installing energy efficient lighting is a simple way for schools to reduce their systemic energy consumption while, on the other part, making good use of daylight in a classroom can reduce lighting costs by 20% and then the non systemic energy consumption: both the action represents an example to reduce a un-systemic energy consumption. Installation of high energy efficiency lights is an action by Senior Energy Guardians while turning off the lights to favour the daylight use is an action by Junior Energy Guardians.

10. EXAMPLES OF ENERY ACTION PLAN

JEGs ENERGY ACTION PLAN *(Please, make one for each action identified)*			
Responsible for the action	**Description of the action**	**On which consumption falls**	
		Electrical	**thermal**
Students	The entrance of natural light should be maximized, completely opening the roller shutter, unless direct sunlight disturbs anyone. It is sufficient that even just one person requires the lowering of a roller shutter because it must be closed: energy savings must bring well-being, not sacrifice.	x	

JEGs ENERGY ACTION PLAN *(Please, make one for each action identified)*			
Responsible for the action	**Description of the action**	**On which consumption falls**	
		Electrical	**thermal**
Students	Open the windows for short periods, keeping the classroom door closed, to avoid excessive dispersion of the heat contained inside.		x

JEGs ENERGY ACTION PLAN *(Please, make one for each action identified)*			
On which consumption falls	**On which consumption falls**	**On which consumption falls**	
		Electrical	**Electrical**
For non professor staff	At the school entrance at 7.30 am, only the lights necessary for the staff to do their work are turned on. The lights in the classrooms are left out, as are the lights in the side corridors. The light in the two central corridors is switched on only if necessary.	x	

JEGs ENERGY ACTION PLAN *(Please, make one for each action identified)*			
On which consumption falls	**On which consumption falls**	**On which consumption falls**	
		Electrical	**Electrical**
Teachers	Professors are responsible for the management of light in the teachers' room, in the laboratories, in the gym, so the production of artificial light, which generates costs and pollution, must be made minimal, respecting the constraint of ensuring the well-being of everyone.	x	

To promote energy efficiency in schools, the following good rules of conduct are recommended:

- Switch off or not switch on the lights when there is a good condition of natural light.
- Turn on or keep the lights on when there is little natural light (if there are several switches, only one part can be turned on).
- Take care of switching off the lights when changingthe classroom and at the end of the lessons.
- Take care of turning off the lights in the bathrooms.
- Turn off the lights left on when the school closes.
- Before the entrance of the students keep the lights off.
- Use the headlights only in conditions of poor natural light.
- At the end of the hours of physical education, turn off all the headlights of the gym.
- Ensure the sustainable use of computers and photocopiers or other electrical equipment by including energy-saving options in PCs.
- At the end of the working day, turn off all the lights and the various electrical equipment, avoiding to keep the standby lights on.

11. ENERGY ACTION PLAN FOR THE PETOFI SANDOR SECONDARY SCHOOL

JEGs ENERGY ACTION PLAN *(Please, make one for each action identified)*			
Responsible for the action	Description of the action	On which consumption falls	
		Electrical	thermal
Students	The entrance of natural light should be maximized, completely opening the roller shutter, unless direct sunlight disturbs anyone. It is sufficient that even just one person requires the lowering of a roller shutter because it must be closed: energy savings must bring well-being, not sacrifice.	x	
Students	Do not overheat the rooms! If the room temperature exceeds 22 ° C, indicate it to your teacher or technical service provider to take the necessary action.		x
Students	Turn it off! Turn off office tools and dont put them in standby mode if you are not using them.	X	
Students	Ventilate! If the weather permits, open the windows when the room doesn't cool.		x
Students	Energy saving reminder eg "Turn off the lights if there is no one in the room." "Stop the faucets if you don't use them!"	x	
Students	School faucets should always be closed kept out of use and should be checked. For example, if a hot water tap is left open when not in use, it will not only waste water, but also the electricity needed to produce hot water	x	
Students	Let's do groups, use the last 5 minutes to stop computers, check the classrooms.	x	
Students	Open the windows for short periods, keeping the classroom door closed, to avoid excessive dispersion of the heat contained inside.		x

JEGs ENERGY ACTION PLAN *(Please, make one for each action identified)*			
Responsible for the action	**Description of the action**	**On which consumption falls**	
		Electrical	**thermal**
Students	At the end of the physical education lesson, a team look at the lights, faucets that have been turned off and locked everywhere.	x	
Students	If you notice that the cold (winter) / warm (summer) room is flowing in closed doors and windows, look for the cause. If you discover a fault in the insulation, report it to your teacher or technical service provider to take the necessary action.		x
Students	If you notice that you do not heat the radiator on the full surface of the radiator, talk to your teacher or technical service technician to see if the system needs to be vented.		x
Teachers	Professors are responsible for the management of light in the teachers' room, in the laboratories, in the gym, so the production of artificial light, which generates costs and pollution, must be made minimal, respecting the constraint of ensuring the well-being of everyone	x	
Teachers	If you are planning a lesson in a lesson that involves a significant average energy consumption, try to organize the lesson as a function of the capacity so that several classes can participate at the same time.	x	
For non professor staff	At the school entrance at 7.30 am, only the lights necessary for the staff to do their work are turned on. The lights in the classrooms are left out, as are the lights in the side corridors. The light in the two central corridors is switched on only if necessary	x	
For non professor staff	In the case of the need to replace electric consumers, they would have to purchase energy-efficient and energy-efficient consumers at the time they were purchased.	x	

JEGs ENERGY ACTION PLAN *(Please, make one for each action identified)*			
Responsible for the action	**Description of the action**	**On which consumption falls**	
		Electrical	**thermal**
For non professor staff	Conversion of operating schedules (heating, cooling, ventilation daily, weekly schedule, reduction of internal temperature in the heating season in the heating season)		x
For non professor staff	In the school canteen, the temperature setting of the cooler should be checked to cool only to the required temperature, not to be overheated, which is energy wastage, and also to increase operating costs.	x	
For non professor staff	Maintenance: Filters, Fan V-belts, System Ventilation, Heat Insulation Check, Replace as needed, Repair		x
For non professor staff	System Adjustment: Check the status of the control elements and the existence of setting values		x
For non professor staff	Operating suggestions - system performance can be increased by regular monitoring and maintenance:	x	x
For non professor staff	Reducing the water temperature of the heating system (the temperature of the heating water can be reduced depending on the outside temperature)		x