CREST Project

Living Lab experiment – Desktop material consumption

Anthony Baltz
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Content

Aim of the document

This document describes the activity that has been run in the living lab settled in Temple Sutton Primary School in Southend-on-Sea.

Audience: Living lab users. Pupils from the classrooms equipped with the living lab. People attending the CREST LESS CO2 Schools workshops.

1   Aim of the activity: Electric consumption of desktop material and behaviour adaptation

Goals:

- Show that desktop material like computers or projectors still spend energy while they're on standby mode and not completely off.
- Make users realise the amount of energy and the amount of money that these consumptions represent at a whole school level.
- (optional) Show the person associated with the experiment how to use the sensors in order to be able to be autonomous on other experiments.
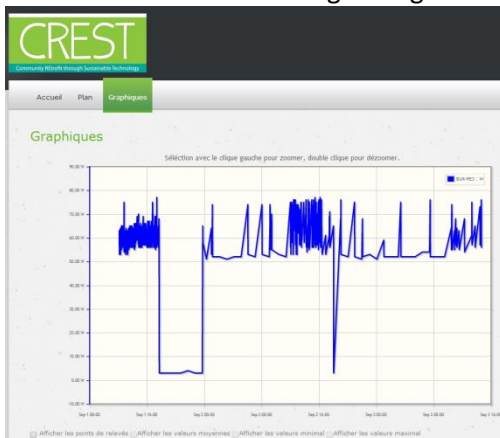
2   Equipment required

To realise this experiment, the following material is needed:

- A device with a standby mode:
    - Computer
    - Projector

- A ZPlug sensor recording the electrical consumption for each device monitored.

- The sensor website showing the figures

- A living lab user being able to follow the protocol.

3 How to run the activity

Plug the devices to monitor on the ZPlug sensors.

Leave the teacher to use the classroom normally for a whole week while the consumption is recorded.

On the figures, it is important to note the power of each device monitored. This will be necessary to calculate the consumption and it's also useful to identify the different devices profiles.

The power in W when the devices are turned on/on standby/turned off allows to calculate the consumption in each of these status.

After a week of normal use and monitoring, it's possible to improve the consumptions and the behaviours.
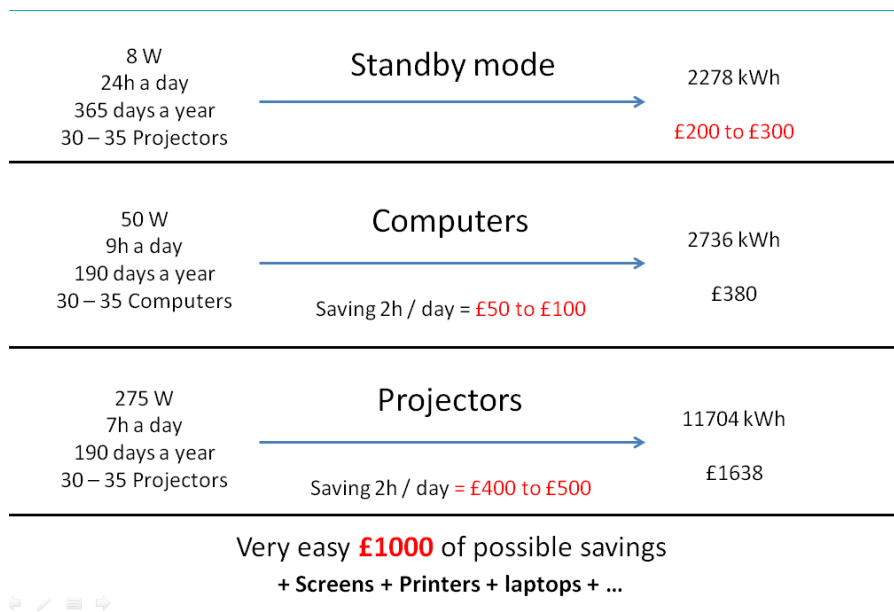
4 Results
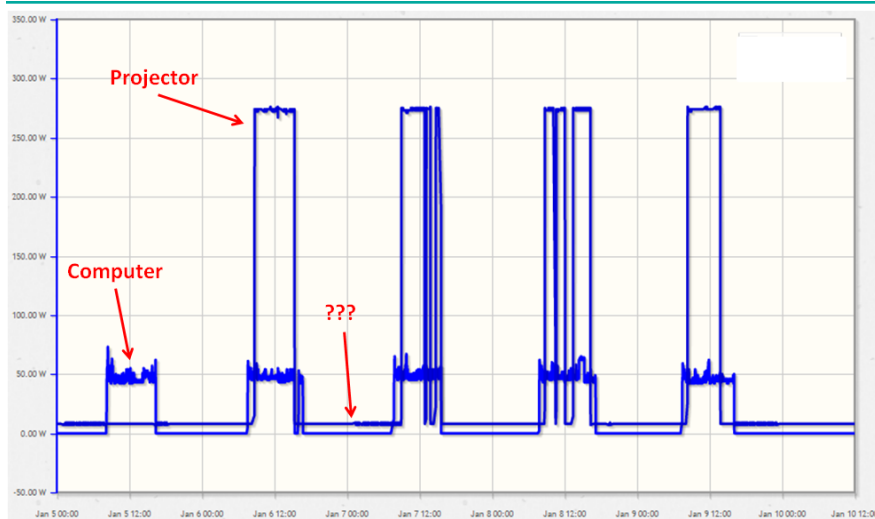
Computer = 50 W

Projector = 275 W and 8 W on standby

We can notice several things from this figure based on the results from the Zplug recordings:

- Energy profiles for each kind of device: a PC has a power of 50 W in average whereas a projector is 5 times more powerful (275 W).
- When the teacher thinks turning the projector off, it's actually left on standby mode and still has a residual power of 8 W.
- We can also notice that most of the time, the PC and the projector are turned on in the morning when the teacher is coming in and turned off in the afternoon after work without being turned off throughout the day. This represents a big waste of energy.

8 W 24h a day 365 days a year 30 – 35 Projectors	Standby mode	2278 kWh £200 to £300
50 W 9h a day 190 days a year 30 – 35 Computers	Computers Saving 2h / day = £50 to £100	2736 kWh £380
275 W 7h a day 190 days a year 30 – 35 Projectors	Projectors Saving 2h / day = £400 to £500	11704 kWh £1638

Very easy **£1000** of possible savings

+ Screens + Printers + laptops + …

It is important afterwards to show the energy savings that can be done without leaving the devices in standby mode rather then turning them off and by changing behaviours and habits in terms of turning off the material when it's not needed. These savings must be translated into units that people can easily understand so they can realise the impact that small changes can have the environment and their budget.

- Here, a projector in standby mode (8 W) left a whole year is consuming 2278kWh. If this is multiplied by the number of projectors in the whole school, it represents a waste of £200 to £300 per year.
- A computer running 9 hours per day for 190 days per year is consuming 2736 kWh (£1638). If this computer is turned off only 2 hours per day, and if all the teachers of the school do the same thing, that would save £100 each year.
- For the projectors which are 5 times more powerful, the savings can be brought to £500 each year.

5   Other experiments possible

It is possible to do exactly the same experiment but with other devices. For example, it is interesting to have a look at the printers consumptions as those equipments are always turned on even at night even though nobody's using them.

This activity can also be adapted for pupils bringing their preferred devices like gaming consoles, phone chargers in order for them to realise what's the consumption for each of them.