**THEORY!!! Why it is important to save electricity (David)**

**Like always at first: The theory!**

Electricity is the “finest” shape of energy, which is used in school and at home. While your house is gas-heated and heated with fuel oil and at best to drive a combustion engine, electricity can be used universally: for heating, for the generation of warm water, for lighting, for the drive of an electric motor and for the activity of a computer or all of the communications equipment (fax, phone, even the ring for break in school).

**But this valuable energy has to be generated with a big expenditure and must be distributed. In Germany there are many large and small power stations, which are only necessary for the generation of electricity. Nowadays electricity is obtained mainly from nuclear energy and the burning of coal and gas. Electricity from the sun, wind and water is free of CO2. But just about a tenth of our electricity is obtained from these renewable energy sources.**

**CO2 emission by electricity**

But the generation of electricity causes a big pollution of the climate. Although electricity drives electrical gadgets emission-freely, you must remember that somewhere in the power stations are pollutants and CO2 produced. **For generating one** **unit of energy there are used three units of fuels.**

**Energy consumption in school**

Most energy is needed for the **lighting**. Besides you need it for the heating pumps, household gadgets, the office gadgets and the many computers in the school.

People discuss about the question, whether you should switch off the lights during the short breaks as well to save electricity. The answer always is: yes!!! Modern lamps do not get broken because of on or off switching and also don’t consume more electricity.

**Electricity - the most important shortly!**

1. Electricity is electrical energy, which is simply converted into other shapes of energy (motion, communication, maintenance, light). That’ why it’s so valuable.

1. At present electricity is mainly generated in big power stations and there in large part by fossil fuels (especially coal, but also natural gas and mineral oil). At the effort of these fuels CO2 is released which leaks into the atmosphere and there, it strengthens the greenhouse effect.

1. The electricity which is generated in the power stations will be transported in cables to the consumers. There it is available all day.

1. Electricity seems like clean energy to us. For the generation of one kilowatt-hour, there has to be inserted three kilowatt-hour fuels. The losses are led away as waste heat in the environment.

1. The school's electricity is mainly used for lighting, but also for the ventilation systems (for the sports hall or the assembly hall), for many electrical gadgets and for heating pumps and several controls.

1. The annual electricity consumption of a gadget is composed of the electrical power multiplied with the term. The power of a gadget (with the unit kW or Watt, 1 kW = 1000 W) can be recorded with an energy gauge. The term (hours per day and days per year) must be estimated.

1. With one kilowatt-hour you can
* blow-dry your hair for one hour (1000 W) or
* load your mobile phone for ten days (4 W),
* drive a light bulb for 16 hours (60 W) or
* an equally bright energy-saving bulb (13 W) for more than three days
* bring about 10 l water to the boil (from 10 degrees) or
* transport a person (75 kg) onto the Mont Blanc ( 4800 m)

1. The prize for one kilowatt-hour is likely to be 30 cents for a household.

**How can you save electricity?**

At the beginning there should always be an approximate analysis of the electricity consumption. Because of the fixing of installed powers and the estimation of the terms you can see, which areas and gadgets contribute to the total electricity consumption to what extent. You also get your electricity bill from the school administration, the caretaker or the [municipality](https://de.pons.com/%C3%BCbersetzung/englisch-deutsch/municipality).

**Lighting:**

1. With the lighting there are several possibilities of saving energy:

The lettering of the light switches awakes the consciousness to save energy and single light strips can be switched [specifically](https://de.pons.com/%C3%BCbersetzung/englisch-deutsch/specifically).

1. You’ll get a feeling, when the lightings must be or can be switched off in the morning and on in the afternoon.

1. The sun guards should be used that the natural light can be used optimally without dazzling. That has to be tried and practised.

1. During the cleaning times there shouldn’t be switched on lights in all rooms. Speak to the cleaners and check their behaviour.

1. In the sports hall the tap-change operation shall be used (half/full lighting). During the lessons 200 lux are enough.

1. If the demanded illumination (300 lux) in the classroom falls below clearly, there will be the possibility for savings: Maybe it’s still bright enough, when every second lamp is unscrewed (of the caretaker).

1. But also, if the artificial lighting isn’t sufficient, it won’t be necessary to install new lamps with higher electricity consumption immediately: Mostly a careful cleaning of the lamps will already do (of the cleaners).

1. The ceiling, walls and floors should be in bright colours to improve the reflection. That’s also valid for the furniture. You should remember that for the next renovation.

1. Fluorescent lights can possibly be retrofitted to reflectors. But also, the replacement of the old ones with new and narrow fluorescent lights is sometimes fit for purpose.

**Electrical gadgets:**

1. With electrical gadgets you can avoid durable vampire power consumption by the use of plug sockets. Computers should be so installed that they go into the saving-mode after a few minutes of non-using.

1. The caretaker should show and explain you the ventilation system and you should discuss with him about possibilities to save energy. (There are some in most cases. Think about the operating time and the [recirculating](https://de.pons.com/%C3%BCbersetzung/englisch-deutsch/recirculating) [air](https://de.pons.com/%C3%BCbersetzung/englisch-deutsch/air))

1. A photovoltaic system which is installed on top of the school building would be very eco-friendly too. Such systems are optically very impressive, improve your image and they are really worth because of the feed-in-tariff.

**STATION 6: WHY IS IT IMORTANT TO SAVE ELECTRICITY? (Verena)**

**Station 6: why is it important to save electricity?**

**Explain:** Electricity comes from power plants. They burn material like coal, oil and gas which produces carbon dioxide. This is increasing the greenhouse effect .

For the main part electricity and warmth are produced by burning fossil energy sources.

Electricity comes for us just out of the plug. The energy comes from big power station and over the good electric system (you have all seeing the big High-Voltage Lines) to all the people who need it.
In this cases fossil power sources like Cole, oil or gas are used to produce energy. But also in Bio power plants (use of wood) or nuclear power plants is electricity produced.

The power generation in larger system is based on so-called steam power processes. During the burning or nuclear reactions warmth is produced which is heating up water to steam. The steam is giving its energy to a steam turbine which is spinning very fast. The directly coupled generator is producing by its turning motion in a electric field power. This power goes over Transformers and high voltage Lines over a big power net to its customers. Smaller stations use gas turbines (which means waste gas is spinning a turbine) or engines (burning of fuel).

In Germany about the half of the power is produced in coal power systems, a third in nuclear power stations and just about 5% are produced in regenerating power stations(the wind, water or sun). You should also know the electrical power can't be stored that easy. Out of this reason we must produce as much as people need at that point. So the power systems have to produce as fast as they can.

Power stations have a efficiency up to 60% (usually just 40%). The degree of utilisation of the power provision is 35%. That's the reason that the use of power out of the plug is just seemingly clear. Then behind one kilowatt hour is approximately 3 kilowatt hours burning material energy. So energy is how you see highly dirty.