

Checklist Heating and Ventilation System

School:.....

Group (names of all pupils):.....

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Taker of the minutes:.....

Tutor of the group (name, position):.....

Dialogue partner (name, position):.....

Date:.....



Find out where electrical energy is used in our school to run heating or ventilation! Examine the respective devices and make a guess about their electric energy consumption.

Ask the caretaker or another suitable person to help you with answering the questions. You should solve the arithmetic problems yourself.

Answer the questions in sequence! Be considerate when walking through the school! Enter the locations of the devices into the plan of the school. If possible take pictures that are in line with your topic!

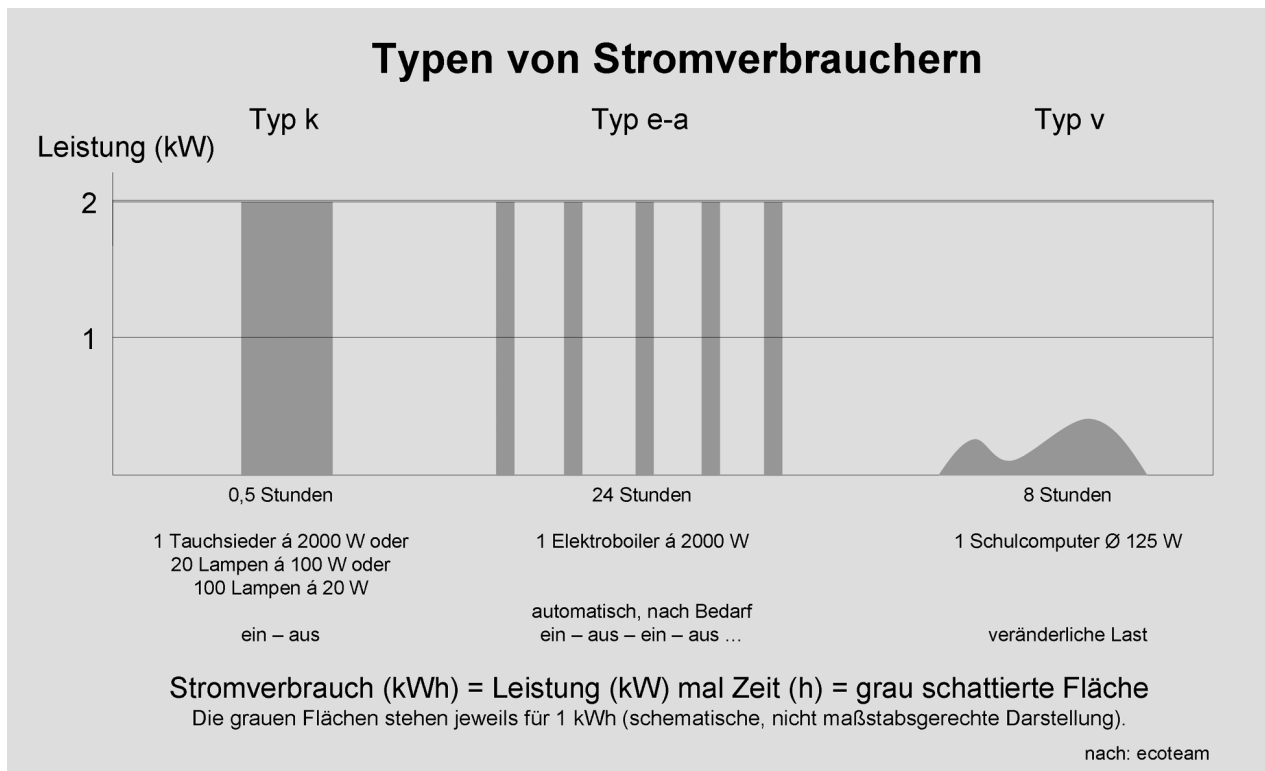
1 Heating as electricity consumer

Electricity consumption (electrical energy) often isn't easy to determine.

a) What might be the difficulties of determining the electrical consumption, think about it with the help of the illustration below.

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b) Later (question 2) you will determine the power demand of electrical devices und estimate the resulting electricity consumption. Why isn't there a particularly exact result for example for a pump that pumps the heating water from the boiler to the heaters?

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d) How could you proceed, to get a more exact electricity consumption of the above mentioned devices?

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2 Examination of the devices

Nowadays heat energy is mostly taken from gas, oil or long-distance heating – nevertheless heating systems as well as a possibly given ventilation system need electrical energy as well. Find out which of the following devices are used at our school, where they are located and what their task is:

Ventilator at the boiler or the chimney:

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Circulation pump of the heating system:

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Ventilation motor for the room ventilation or for exhausts:

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Attention: electrical heaters (radiators or fan heaters) are *not* part of your task.

Now estimate the electricity consumption per year for these devices. Proceed as follows:

- a) First determine the **electric power** of each device.
 - Maybe this value is marked **on the device** (for example, on the label of an electric motor).
 - Even if this isn't possible you enter the device into the checklist all the same, but you don't indicate the electric power.
- b) Calculate the **sum of the electric power** of the devices.
- c) Estimate the **operating time** of the devices. First make a guess about the running time per day and multiply this by the number of operating days per year. For example, the exhaust in the chemistry lab is used for 6 h each day – and on 200 schooldays a year; this equals 1.200 operating hours per year. Possibly these devices are used at different times (for example the ventilator for the boiler is only running when the heating is running, but the circulation pumps run all the time). Enter such information in the list under "remarks". Then do the calculations b) to d) separately and only eventually add the given electricity consumptions.
- d) Multiply the running time (hours per year) by the sum of the electric power (kW); as a result you get the yearly electricity consumption (kWh per year) for your devices.

Examination record heating and ventilation

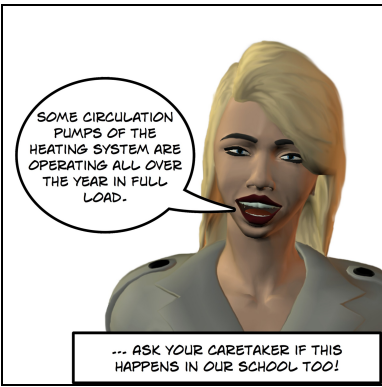
a) Room no. / name	Device/ quantity	Electric power per device (W)	Total electric power (W)	Remarks
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b) Sum (in W)
Sum (in kW)

c) Running time (estimated value) in hours per day
Operating days per year
Running time in hours per year

d) Electricity consumption in kWh per year

e) Ask the caretaker what is already done at our school to keep the electricity consumption of the heating and ventilation system as low as possible.
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Discuss what we could do better! Justify your suggestions!

Think about how you would like to present your results to other pupils and teachers!

Work out a paper for example and explain an energy-saving use of the heating and ventilation system. Keep in mind that the teachers normally understand as little of this technology as you – therefore you have to explain everything in a comprehensible way, depict your results clearly and justify your suggestions for improvement well!

Or you write a letter to our headmaster, name the problems you uncovered and ask him as concretely as possible to support you energy-saving suggestions. Pay attention to the fact, that you justify your suggestions comprehensibly and you clearly show their potential advantages!

Now get ready to present your results!

