

# Checklist Power Generation

School:.....

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

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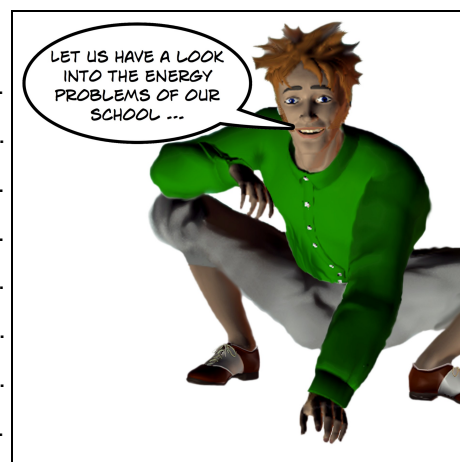
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Taker of the minutes: .....

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

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

Date: .....



Find out in what ways the generation of electricity used in our school affects the environment and what possibilities we have to use environmentally friendly sources of energy! Ask the caretaker or another suitable person to answer the questions with you. You should do the arithmetic problems yourselves.

Answer the questions in sequence! Be considerate when walking through the school! If possible take pictures that are in line with your topic!

## 1 Electricity consumption and power generation

Evaluate the energy bills of at least the last three years with your teacher or the caretaker. If there is a group that works on electricity consumption you should include them in this.

Note the exact billing period (1) and the consumption (2).

Also note the data about the energy mix used (3). Note the CO<sub>2</sub>-emissions caused by our energy mix (4); *in case* the bills don't show any, calculate this yourselves: 1 kWh correspond a nationwide average of 616g CO<sub>2</sub>/kWh.

Also note the radioactive waste that is produced (5) as well as the energy provider.

If there are several meters, write down the data for each of the meters and eventually sum up the numbers.

Meter no. ....

	last year	two years ago	three years ago
(1) Period of time	.....	.....	.....
(2) Consumption	.....kWh	.....kWh	.....kWh
(3) Electricity mix			
renewable energies	.....%	.....%	.....%
nuclear power	.....%	.....%	.....%
Fossil/other energies	.....%	.....%	.....%
(4) CO <sub>2</sub> -emissions (t)	.....t	.....t	..... t
(5) Radioactive wastes (kg)	.....kg	.....kg	..... kg
(6) Energy provider	.....	.....	.....

## 2 Research

Get information on the eco-political background of energy generation. You could use your schoolbooks or the internet.

a) Get information on energy generation:

What is the energy source for the electricity used in Germany; what is the percentage (%) of each energy source?

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In what way CO<sub>2</sub> is set free at power generation and to what extend this contributes to the climate change? .....

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Are there other environmental problems that are linked to power generation?

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In what way does power generation and power consumption develop worldwide?

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b) Get information on "green electricity", you can find information for example on the following site:  
[www.umweltschulen.de/energie/energiewechseln.html](http://www.umweltschulen.de/energie/energiewechseln.html)

What is green electricity?

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What advantages does green electricity have?

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What problems are linked to it?

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In what way could we obtain green electricity at our school – or what might possibly be against it?

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c) Get information on photovoltaics/photovoltaic solar power plants. Use [www.wikipedia.de](http://www.wikipedia.de) for example or ask experts. What elements make up a photovoltaic solar power plant and how does it work sie?

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What sites are generally suitable for a solar power plant?

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How is solar power converted into line current?

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What is the area of the solar cell ( $m^2$ ), the installed capacity ( $kW_p$ ) and the yearly harvest (kWh), what is the interrelation between these values?

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What does it cost to build a solar power plant with a capacity of about 100  $m^2$ ?

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What are the returns per kWh that is supplied into the public network?

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What is amortisation and how long does it last until a solar power plant will be amortised?

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### 3 School solar power plant

Check if our school could produce its own electricity with photovoltaics.

a) Think which roofs might possibly be suitable for a solar power panels!

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b) Determine the size of this surface ( $m^2$ )!

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c) Determine the size of the photovoltaic solar power plant ( $m^2$ )!

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d) Estimate the cost of such a plant!

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e) Estimate the output (kWh or returns in €), that the plant could achieve per year!

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f) Calculate how much of our electricity consumption we could cover with this plant (%)!  
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g) Calculate how much CO<sub>2</sub> we could save!  
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Now present your results to your teacher or tutor!

#### 4 Evaluation and presentation

Now summarise your findings about the power generation in our school. Justify your assessment in such a way that teachers and pupils understand it!

It is good ...

It is not good ...

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Discuss what we could do better! Justify your suggestions!

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

You could write a letter for example, in which you ask the school management to vote for a solar power plant on the roof or to have the school be supplied with green energy

You could also ask your parents to support the building of a photovoltaic solar power plant.

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Now get ready to present your results!

