

ENERGY & CLIMATE ACTION AUDIT

Name: _____ Grade: _____

INTRODUCTION

I wonder...

- **What are the ways we use energy in school?**
- **What is energy conservation?**
- **What is energy efficiency?**

We need energy to function in our technology-based society. Every time you turn on a light, print a document, wash your hands in warm water; energy, predominantly electricity, has been used.

First things first, energy is not free. Not only do you pay money for electricity, but it also comes at an environmental cost. The most common way to generate electricity, particularly in South Africa, is to burn coal or oil. Coal mining is one of the most destructive activities on the planet. It causes habitat destruction, massive amounts of pollution, creates waste that can harm the environment as well as using and polluting scarce water resources. When coal is burned to create steam, it releases massive amounts of pollution that is terrible for the environment and a big contributor to global warming.

In order to ensure that schools can join the fight against global warming and environmental degradation they should be leaders in energy efficiency and sustainability.

The best place to start is an energy audit. This audit is used to identify the different ways that energy is used in schools.

Schools can then use this look at ways to reduce energy needs in schools and integrate these changes into their management plans. This will not only save money but lessen the environmental impacts as well as reduce South Africa’s dependence on coal.

ACTIVITY

Getting started with the audit:

Safety First

- Please treat all equipment as live.
- Do not touch hot/heated objects.
- If using a ladder, please ensure someone is steadying it.

Basic Energy Audit

Hint: teams will save time

School Name: _____

Number of Buildings: _____

Square meters of buildings: _____

Number of students: _____

Number of staff: _____

Teaching hours: _____

Opening hours: _____

Type of Fuel used (please circle)

Electricity Oil Coal Wood Solar Wind Gas

ENERGY & CLIMATE ACTION

Grade 8 - 11 Audit

Buildings



Multiple Cracks in the walls		0
Moderate number of cracks in the walls		2
Few to no cracks in the walls		5

Roof



Roof in poor condition		0
Roof in moderate condition		3
Roof in good condition		5
Ceiling in rooms		5
No ceiling in rooms		2
Insulation in roof		5
No insulation in roof		2

Windows



Multiple broken/cracked windows		0
Few broken/ cracked windows		3
No broken/cracked windows		5
All windows correctly sealed		5
Most windows correctly sealed		3
No windows correctly sealed		0
Windows easily opened in		5
Windows unable to be opened		2

ENERGY & CLIMATE ACTION

Grade 8 - 11 Audit

Windows in areas of high light tinted or curtained		5
Windows in areas of high light not tinted or curtained		2

Doors



Doors correctly sealed when closed		5
Doors partially sealed when closed		3
Doors do not seal when closed		0
No doors remain open during cold periods		5
Few doors remain open during cold periods		3
Multiple doors remain open during cold periods		0

Geysers



Geysers set to 55°C		5
Geyser set to between 56°C and 65°C		3
Geyser set above 65°C		0
Geysers regularly maintained		5
Geysers not regularly maintained		0
Geyser blankets on geysers		5
No geyser blankets		0
Geysers switched off during holidays		5
Geysers left on during holidays		0
School has solar geysers		5

ENERGY & CLIMATE ACTION

Grade 8 - 11 Audit

School has no solar geysers		0
-----------------------------	--	---

Air conditioners



No air conditioners		5
Select rooms have air conditioners		3
Air conditioners in every room		0

Lighting



School uses energy efficient lighting		5
School uses energy inefficient lighting		0
School uses natural lighting whenever possible		5
School has moderate use of natural lighting		3
School does not make use of natural lighting		0
School makes full use of dimmers, sensors, etc.		5
School makes limited use of dimmers, sensor, etc.		3
School does not make use of dimmers, sensors, etc.		0
Learners and teachers switch off lights when not in use		5
Learners and teachers do not switch off lights when not in use		0

Equipment



# Computers	Electronic equipment is switched off over weekends and holidays.		5
# Photocopiers	Electronic equipment is not switched off over weekends and holidays.		0
	Electronic equipment properly maintained		5

ENERGY & CLIMATE ACTION

Grade 8 - 11 Audit

Electronic equipment not properly maintained		0
All electrical appliances energy efficient		5
Some electrical appliances energy efficient		3
No electrical appliances energy efficient		0

Swimming Pool



Swimming pool unheated or solar heated OR no pool		5
Swimming pool electrically heated		0

Human Behaviour



Most students and teachers are energy aware		5
Some students and teachers are energy aware		3
Few students and teachers are energy aware		0

Total score (120) =

The closer your score is to 120 the more energy efficient your school

DISCUSSION

Discussion Points

- How energy efficient is your school?
- Where were the biggest energy wastage elements?
- How do sealed windows affect energy losses/gains?
- What do open and closed doors have to do with anything?
- What are the benefits of solar energy?
- How effectively does your school make use of natural features e.g., natural lighting, wind etc.? Can these be used more resourcefully?
- What simple actions can be taken at your school to address issues?

ACTIVITY**Calculating Kilowatt-Hours**

Most appliances will have their power rating given in Watts or Kilowatts.



Kenwood mixer

LED light bulb

Toaster

We can use this Watt amount to work out the kWh over a given time-period.

For example:

$$\text{Appliance watts} \times \text{hours used (per month)} = \text{monthly Wh consumption} (\div 1000) = \text{monthly kWh}$$

Take the Kenwood mixer above. Its power rating is 250W. I use it for 3 hours per month.

$$250W \times 3 \text{ hours} = 750 \text{ Wh consumption}$$

$$750W / 1000 = 7.5kWh \text{ per month}$$

Items used for times periods less than an hour will need to be converted to hours using the following equation:

$$\text{minutes used} \div 60 = \text{hours}$$

DISCUSSION

Discussion Points

- Did the kWh consumption in your classroom surprise you?
- How much does a kWh cost?
- How much are your classroom's energy requirements costing the school?
- How much energy could be saved by switching off appliances when not in use?
- What simple changes could you make to your classroom to reduce these energy requirements?
- How does your classroom compare to other areas of the school?

Extension Work

Can you think of other ways that your school consumes and wastes energy (e.g. transport)?

Research this energy usage, using skills obtained from the previous lessons and audits and create a management plan to make it more energy efficient.