

## Resources :

Bailey, Donna  
**Energy From The wind and water**  
Steck-Vaughn (1991)  
ISBN: 0811425193

Barber, Nicola  
**Renewable Energy**  
Evans (1995)  
ISBN: 0237515253

Binns, Tristan Boyer  
**A bright idea conserving energy -**  
Heinemann Library (2005)  
ISBN: 1403468508

Catherall, Ed  
**Exploring Uses of Energy**  
Steck-Vaughn (1991)  
ISBN: 9780811425988

Jen, Green  
**Saving Energy**  
Hachette children's book (2007)  
ISBN: 9780750251747

Readman, Jo and Roberts, Ley Honor  
**George saves the world by lunchtime**  
Random House Publishers  
ISBN: 9781903919507

Smith, Viv  
**I can help save energy**  
Franklin Watts (1999)  
ISBN: 0749633859

Teaching sustainable development in primary schools:  
Association for Science Education  
ISBN: 0863573363

Friends of the Earth Information Booklets:  
**www.foe.co.uk**, dropdown search click on 'Learning'  
then click on 'Educators', then click on 'Resource'.

Understanding Global Issues:  
A series of briefing magazines providing background  
information and analysis of current issues. 2003 titles  
include:  
The Battle for Oil.  
The State of Israel.  
Beyond Petroleum.  
Publishers: Understanding Global Issues Ltd (1992)

### Webquest on Sustainability

There are four online activities from building a  
sustainable planet to saving the world from global  
warming and measuring your global footprint. Go to  
**www.global.igfl.net** and click on 'webquests' at the  
top of the page and then click on primary school  
webquests. Appropriate for KS2 & 3.

## Websites :

**www.energyandenvironment.undp.org**  
click on 'Library' then search for 'A review of energy'.  
Report on Energy and MDGs by the UN:

**United Nations: www.undp.org/energy**  
energy and sustainability, reports and links from the  
Climate Change 2001, Impacts, Adaptations...

**www.grida.no**  
click on 'Publications' then 'IPCC Third Assessment  
Report' Vulnerability Report by IPCC.

**The Stern Review: www.hm-treasury.gov.uk/**,  
search for 'The Stern Review'. The Stern Review on  
the Economics of Climate Change, a series of pdfs  
about the effects of climate change around the world:

**www.iisd.org/climate**  
downloadable documents on energy and climate  
change.

**www.parliament.uk**, search for 'postnote 269'.  
'Adapting to Climate Change in Developing Countries'  
a briefing about the issues by Parliamentary Office of  
Science and Technology:

Energy and renewable energy fact sheets:  
**www.ypte.org.uk**, search for 'energy factsheet' and  
'renewable energy'.  
Also sheets on global warming etc: scroll to bottom of  
the page and click on 'downloads'.

Article on Climate Justice and Equity :  
**www.globalissues.org**, click on 'Issues', then on  
'Climate Change and Global Warming', scroll down to  
'Climate Justice and Equity'.

**www.energyfordevelopment.org/links.php**  
List of organisations as weblinks:

**www.ypte.org.uk**  
Young Peoples trust for the environment

**www.panda.org/index.cfm**  
WWF site

**www.e-day.org.uk**  
Energy saving day

**www.wmo.ch/wmd**  
World met day

**www.unep.org/wed/2008/english**  
World environment day

**www.worldusabilityday.org**  
World usability day

**www.globalclimatecampaign.org**  
Global climate change action day

For more information contact:

**HEC Global Learning Centre**  
Tower Hamlets PDC  
English Street, London E3 4TA  
T: 020 7364 6405  
F: 020 7364 6422  
E: [hec@gn.apc.org](mailto:hec@gn.apc.org)



**www.globalfootprints.org**



promoting global learning in schools

**When anything is done or made it requires energy,**  
this comes from food, or fuel, or wind or other  
renewable forms of energy. Most of our energy  
actually comes from the sun and is converted into  
other forms. When we use energy from carbon based  
chemicals carbon dioxide is produced, this is a  
greenhouse gas. The amount of energy we use can  
be expressed as our carbon footprint, on average  
people in the UK produce two tonnes of carbon  
dioxide a year.

Energy use is now the major contributor to the threat  
to life on earth. This threat is known as climate  
change, or global warming. It is causing weather  
pattern changes; animals and plants are changing  
where they live, there is a threat to many lowland  
areas of floods, ice is melting, and the oceans are  
becoming more acidic. It is recognised that these  
changes will affect the developing world far more  
disastrously in terms of agriculture, disease and  
natural disasters.

What can we do to reduce our energy consumption  
and to affect changes around the world?

For many people, the energy they use in the home is  
their single largest contributor to climate change. For  
an average person, it amounts to just over two tonnes  
of Carbon Dioxide (0.6 tonnes of Carbon), a third of  
people's total emissions (excluding flights).  
Approximately half of this is from room heating, 20  
percent from water heating and the rest is split up  
between washing (eight percent), cooking (eight  
percent), refrigeration (five percent), lighting (four  
percent), and other electrical products (five percent).  
People usually underestimate the significance of  
heating - how many people would guess that heating  
water for baths and showers produces over three  
times as much carbon dioxide as the entire iron and  
steel industry?

### Events

<b>February 27</b>	Energy Saving Day UK
<b>March 23</b>	World Met Day
<b>June 5</b>	World Environment Day
<b>Nov. 2nd Thursday</b>	World Usability Day
<b>December</b>	Global Climate Change Action Day

# Global Leaflet 2: Energy

### The Global Context

"The World Summit on Sustainable Development in  
2002 stressed the importance of access to energy for  
the alleviation of poverty. Though some progress has  
been achieved since then, especially on improving  
access to electricity, two point four billion people have  
no access to modern energy services, and one quarter  
of the world population lives without electricity. Ninety  
per cent of rural households rely on traditional energy  
sources for cooking and heating with associated  
indoor air pollution.

*Energy for sustainable development, integrated review  
of progress, the Programme for the Further  
Implementation of Agenda 21 and the Plan of  
Implementation of the World Summit on Sustainable  
Development, UN*

"Energy is a fundamental prerequisite for achieving  
the **Millennium Development Goals** (MDGs).  
Without access to reliable and affordable energy  
services, substantial social and economic  
development simply cannot occur. This is particularly  
true for women and children, as they are  
disproportionately burdened by a lack of modern  
energy services. Although energy is not directly  
mentioned in the eight MDGs, the way in which energy  
services are produced and consumed affects all three  
pillars of sustainable development—economic, social,  
and environmental—and therefore all MDGs."  
'A Review of Energy in National MDG Reports' UN  
Development Programme

### Energy footprint: how it measures up

- One point six billion people in the world, mostly in  
rural areas, have no access to electricity
- One in three people in the world still rely on  
traditional fuels such as wood and dung to meet their  
daily heating and cooking needs.
- The 100 countries most at risk from the impacts of  
climate change only release three percent of global  
carbon dioxide combined.
- The World Health Organisation believes global  
warming is already responsible for more than  
160,000 deaths a year due to increases in malaria  
and malnutrition.
- The average American is responsible for 125 times  
more greenhouse gas emissions than the average  
African.
- Fifty years ago, people used 11 million barrels of oil  
a day. Today, 75 million barrels are used daily.
- Sweden has announced that it intends to be 'oil-free'  
by 2020.

## Case studies of the topic

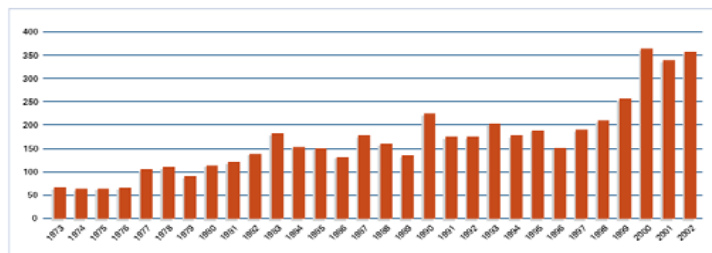
In the Sahelian region of Africa, warmer and drier conditions have led to a reduced length of growing season with detrimental effects on crops. In southern Africa, longer dry seasons and more uncertain rainfall are prompting adaptation measures. *Climate Change 2007: Impacts, Adaptation and Vulnerability* <http://tinyurl.com/ywywt8>

## Impacts of Drought and Floods

Food security in Africa is already affected by extreme events, particularly droughts and floods (e.g., Kadomura, 1994; Scoones *et al.*, 1996). The ENSO floods in 1998 in east Africa resulted in human suffering and deaths, as well as extensive damage to infrastructure and crops in Kenya (Magadza, 2000). Floods in Mozambique in 2000 and in Kenya in 1997-1998 sparked major emergency relief as hundreds of people lost their lives and thousands were displaced from their homes (Brickett *et al.*, 1999; Ngecu and Mathu, 1999; see also [www.reliefweb.int](http://www.reliefweb.int)). The cost in Kenya alone was estimated at US\$1 billion (Ngecu and Mathu, 1999). Droughts in 1991-1992 and 1997-1998 affected livelihoods and economies and heightened renewed interest in the impacts of climatic hazards (e.g., Kadomura, 1994; Campbell, 1999). For example, the impacts of the 1991-1992 drought in Zimbabwe are estimated to have been nine percent of GDP (Benson and Clay, 1998).

Irrespective of whether climate change will cause more frequent or more intense extreme events, it is apparent that many aspects of African economies are still sensitive to climatic hazards.

At the local level, some coping strategies are less reliable (Jallow, 1995)—for instance, Campbell (1999) notes that plants and trees used as food by pastoralists in southern Kenya declined between 1986 and 1996. National governments often struggle to provide food security during times of crisis (Ayalew, 1997; Gundry *et al.*, 1999). For national and international agencies, the cost of climatic hazards—impacts, recovery, and rehabilitation—may result in a shift in expenditure from reducing vulnerability to simply coping with immediate threats (e.g., Dilley and Heyman, 1995). [www.grida.no/climate/ipcc\\_tar/wg2/391.htm#10225](http://www.grida.no/climate/ipcc_tar/wg2/391.htm#10225)



Hydrometeorological disasters: droughts, floods, windstorms, wildfires and extreme temperatures.

<http://tinyurl.com/dnzfgv>

## Reducing the use of electricity

Three key ways of reducing our personal carbon dioxide production through electricity use are:

1. Use less electricity in the home, switching lights off and washing clothes at 30 °C instead of at hotter washes. Leaving one light on overnight wastes enough energy to run a stereo for 24 hours.). If all UK households turned off their TVs at night instead of leaving them on standby, we would avoid emitting enough CO<sub>2</sub> to fill the Millennium Dome 38 times each year. We need to make sure off is off and not standby.
2. Use light bulbs and other household appliances that are energy efficient.
3. We can cut down on our use of heat. Turning the thermostat down by one degree will save you some eight percent of your heating bill. Instead of having scalding water we can turn the water boiler down to 60°C/140°F. Closing a window overnight can save enough energy to drive a small car over 35 miles.

The Government (2002) has calculated that using present technologies we can reduce our energy consumption by up to 30 percent simply through using electricity more efficiently.

Power stations use steam to generate electricity but do not use the heat left over. This is a waste of energy. **Combined heat and power plants (CHP)** use this heat for heating buildings. They can be up to 75 percent efficient compared to 50 percent with normal power stations. CHP plants are normally smaller and generate for a local area, less electricity is lost during distribution. In 2004 6.9 per cent of the UK electricity consumption was generated by combined heat and power plants.

Gas is a much more efficient fuel than coal, especially when the power stations are old. Closing just one coal-fired power station and replacing it with gas would save two million tonnes of CO<sub>2</sub>.

Many industries use motors that are old, inefficient or too big for their needs. If these were replaced with ones that only used the exact amount of power needed this would save the equivalent of three nuclear plants in the UK alone. This can save about four point five million tonnes of carbon each year by 2030.

Apart from improving the houses that already exist we can design houses that use the sun's energy by placing windows in the best places, and using other structural features. This is called passive solar heating. There are architects who design houses with the aim of creating lifestyles with zero carbon emissions (Zedfactory [www.zedfactory.com](http://www.zedfactory.com))

## What Schools can do

The government, as part of its plan for reductions estimates that schools should work toward a reduction of 10 percent of their energy use, saving 0.16 million tonnes of carbon a year. They will be requiring schools to measure their energy use in order to achieve the reductions target and to raise awareness and understanding in children to effect their consumer behaviour.

As part of 'Every Child Matters' your school or youth club can involve its children and young people in discussing, deciding and participating in creating policies and actions that will contribute to solving climate change. This will address the Children's Act 2004 key areas of 'being healthy', 'staying safe', 'enjoying and achieve', 'making a positive contribution' and 'achieving economic wellbeing'.

Newsround: Non- Green schools waste millions . Figures published in 2003 by Eco-Schools show they are spending £459 million each year on electricity, water, clearing up litter and stationery. Website with tips: <http://news.bbc.co.uk/cbbcnews/default.stm>, search for 'Non-green schools waste millions'.



## Actions

An over-view of the energy problem worldwide and what should be done:

[www.unfoundation.org/SEG](http://www.unfoundation.org/SEG)

School sustainability improvement tools:

[www.teachernet.gov.uk/](http://www.teachernet.gov.uk/), search for 'sustainable schools' then click on 'Tools' on the nav bar.

Get involved in the Energy Certification for Schools programme.

[www.sustainablelearning.info](http://www.sustainablelearning.info)

A page that takes you to grants and activities for teachers and students:

[www.earthwatch.org/europe](http://www.earthwatch.org/europe), click on 'Our Work' menu, down to 'Earthwatch Learning', then 'Learning Opportunities' at bottom of page.

Ideas for what you can do from WWF:

[www.panda.org/](http://www.panda.org/), click on 'Climate Change', then click on 'What you can do'.

## Activity: Electricity Diary

Time: homework for two weeks + two lessons

What you need: diary sheet

Curriculum links: mathematics, science, ICT

Learning aim: to link home behaviour and energy use with carbon dioxide production.

A diary of the use of electricity in student's homes. A table of readings from the electricity meter. This could include a diary of uses of electricity and could then be graphed.

From conversion figures the readings can be changed into amounts of carbon dioxide produced. The diaries could be used to discover the activities that use most energy.

An extension activity, students use the conversion figures to create a spreadsheet calculating carbon dioxide production.

## Activity: School Council Policy

Time: two x class meetings, two x school council meetings

What you need: survey, powerpoints, Curriculum links: Citizenship, ICT, English, Science

Learning aim: democratic decision-making on sustainability issues.

Schools in England spend £300 - £400 million per year on energy and produce about 300,000 tonnes of carbon dioxide. Over the next ten years the government estimate it is possible for schools to reduce their energy use by 10 percent, saving 0.16 million tonnes of carbon. It is planning to require schools to measure and reduce their energy use.

The school council can be an integral part of raising awareness and planning for change. The council can:

1. do a survey of the children and parents..
2. with raised awareness get classes and year councils to discuss the global issues and solutions for the school.
3. use the results of the discussions to create a school council energy policy and plan. This should be created in liaison with the school governors and integrated as part of the schools plan. The school council policy could also include proposals for actions:

e.g. a student organised 'Energy Fete', a letter writing campaign, a petition, invited politicians and experts to present, discuss or debate climate issues.