Energy Efficiency and Renewable Energy For Schools

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ecsc

(energy conservation and solar centre)

ecsc - who we are

- Environmental Charity – involved in both energy efficiency and renewable energy
- Development and implementation of programmes to create socially responsible sustainable energy futures.
- Source of free and impartial advice on available grants, technologies and project development for renewable energy and energy efficiency projects
- REAS programme in Surrey and East Sussex
- Options appraisal, feasibility studies, energy audits

Energy Efficiency

Why is energy efficiency important?

- **Cost to your school**
  - You pay the bills!
  - Space and water heating
  - Lighting
  - Computers
  - Catering

Why is energy efficiency important?

- **Rising prices**

  - wholesale gas prices have risen sharply due to higher crude oil prices

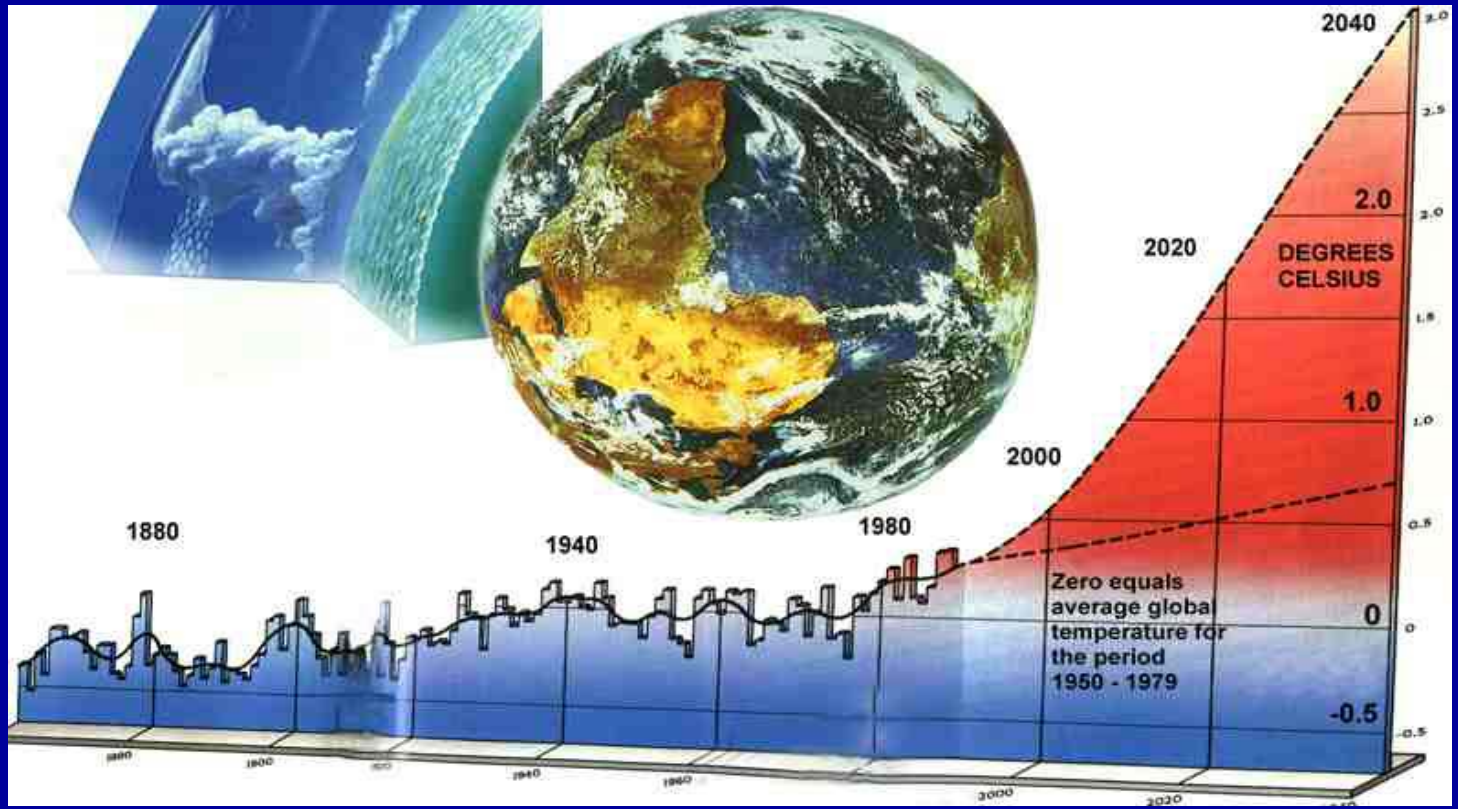
  - A large gas supplier raised prices by 12 ½ %

  - Price for 2005 is more than 50% up on 2003

  - By 2015 75% of the UK's gas will be imported

Why is energy efficiency important?

- Climate change



Why is energy efficiency important?

- The next generation of energy users

“ Schools have a crucial role to play in demonstrating good energy practices to pupils and the community. Learning about and adopting good energy efficiency practices from an early age is key for the future well being of our environment”

- Tim Curtis, director of operations, EST

Saving Energy in Your School: Simple Measures

Lighting

Accounts for 50% of electricity bill, easy place to cut costs

- Turn off lights when not required
- Utilise daylight whenever possible
- Replace standard bulbs with energy saving compact fluorescent lamps (CFLs)
- Install automatic lighting controls, such as time controls, presence detectors and daylight detectors

Chipping Norton School -
Costs reduced by £2,400 pa
despite 60 new computers,
through lighting measures.

Saving Energy in Your School: Simple Measures

Space and water heating

(Accounts for 60% of school's energy budget)

Heating

- Ensuring thermostats are set correctly
- Checking programmer/timers are set right and working
- Close curtains and blinds at night
- Fitting tamper proof thermostatic radiator valves (TRVs)
- Maintaining and testing boiler system annually
- Fitting Zone Controls
- Eliminate need for electric heating

Broomhill Primary School

Measures including zoned heating controls cost £1,120 to install and save £1,000 pa.

Saving Energy in Your School: Simple Measures

Hot water

- Dealing with dripping taps and leaks
- Fitting percussion taps and on/off controls for showers
- Insulating hot water tanks
  and pipe work
- Fitting and checking time switches to ensure that water is heated only where and when it's needed
- Provide cleaners with point of
  use water heaters to use during holidays

Saving Energy in Your School: Simple Measures

Insulation

(Leaking heat could be costing £000's)

- Draught proofing old windows and doors
- Keep windows closed in winter
- Insulate cavity walls
- Insulate roofs

Heath Primary school
Installed a suspended ceiling, loft insulation and cavity wall insulation for £10,000 saving £1000 pa.

Top five energy cost savers for schools

The average school could save up to £17.85 p/pupil pa resulting in 23% reduction in CO2 emissions

- Occupancy sensors (£2.41)
- Classroom lighting controls (£2.22)
- Building energy management syst (£1.93)
- Light reflectors and fewer tubes (£1.90)
- Better energy management (£1.64)

Monitor Savings

- Very little grant funding available for measures

  Therefore…
- You will need to make a capital outlay
- You can re-coupe this through annual savings
- By monitoring savings you can plan future investments…

  - energy efficiency measures

  - school supplies

Measures are all well and good, but they cost money and there's a lot to choose from.

You need to know where you are wasting energy before you can start saving. So…

How do you start?

Identify how you use energy

- Monitor energy use
  - regular meter readings
  - keep tabs on bills
- School energy “walkround”
  - simple/no cost
- Energy Audit
  - in depth/at cost

Whole School Approach

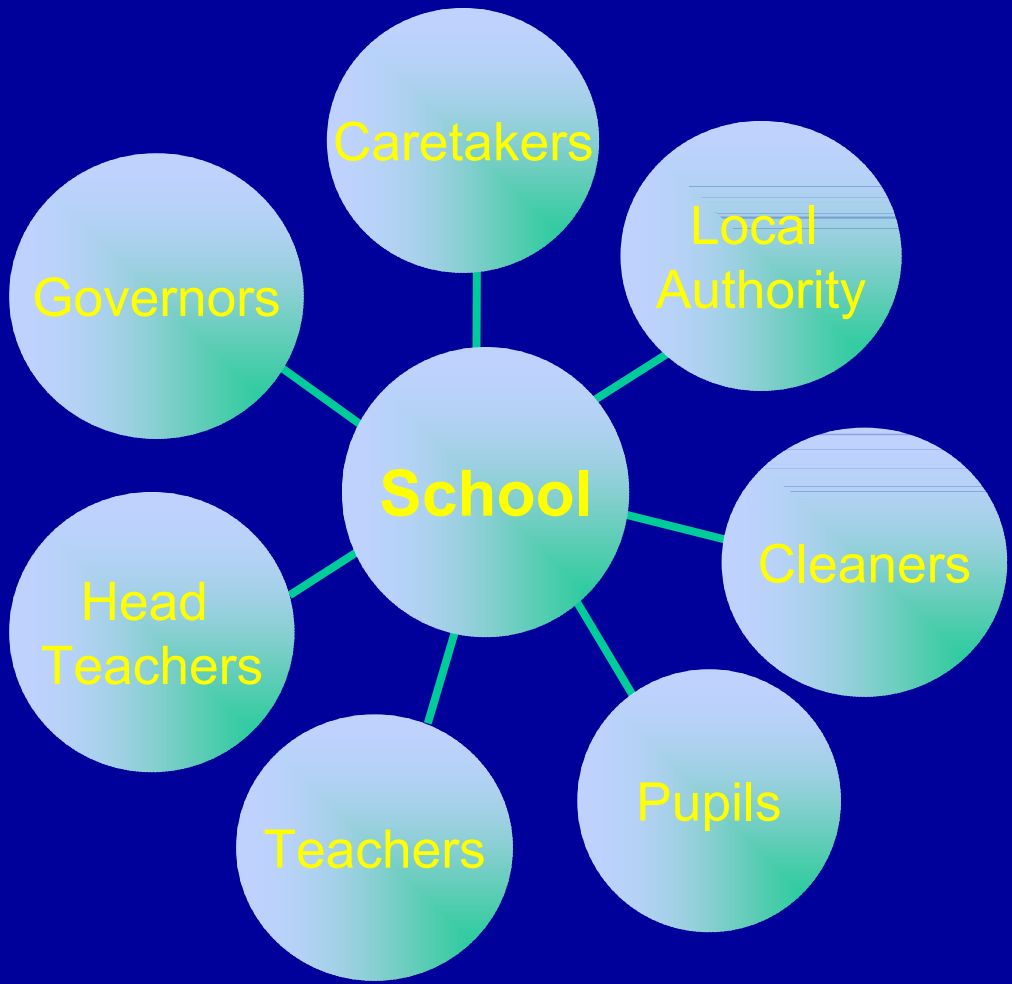
Energy Teams

- first step in whole school approach
- Involve students, teachers, caretakers
- form the team to best suit you

Energy Action Plans

- all encompassing
- Energy matrix, prioritising jobs/measures
- whole school helps
- Will act to drive forward all energy saving initiatives

Everyone is involved



Who can help

EST "**Energy Certification for Schools**"

www.est.org.uk/schools

Global Action Plan "**Action at School**" & "**Plan it cool**"

http://www.globalactionplan.org.uk

The Carbon Trust

http://www.thecarbontrust.co.uk/energy/pages/publication (schools)

Building for the future

If you do anything…

- How much energy are you using?
  - kwh/m²
- Compare to benchmarks

Energy benchmarks (kWh/m²) for good, typical and poorly performing schools

Annual Energy (kWh/m²)	Primary School (no pool)		Secondary School (no pool)		Secondary School (with pool)*	
	Fossil Fuel	Electricity	Fossil Fuel	Electricity	Fossil Fuel	Electricity
Good Practice	110	25	117	28	142	29
Typical Practice	157	34	160	36	187	36
Poor Practice	209	47	207	45	233	41

- By developing a “framework” for energy saving, you will have the foundations for future improvements and make it easier to access extra funding in the future.

Renewable Energy

Renewable Energy - grants and technologies available

Renewable Energy – Why bother?

- Curriculum tie in with Science, Geography, Citizenship
- Grants available
- Reduce energy running costs of school
- Be more environmentally responsible
- Project can be small or large

- Too busy
- Not sure if appropriate for my school
- Too expensive
- Don’t like windfarms
- May need to get planning permission
- Don’t know where to begin

Grants available: Clear Skies

- Lower of 50% of total installation cost or £100k (including any display/marketing/promotion).
- Project must demonstrate real community involvement and raise the profile of renewable energy.
- Match funding for projects is looked on favourably
- Funds all technologies apart from Solar Photovoltaics
- Scheme is likely to to operate for one further year.
- Next application deadline date uncertain
- www.clear-skies.org T: 08702 430930

clearskies
RENEWABLE ENERGY GRANTS

dti BRE

Grants available: Photovoltaics

- DTI Major Photovoltaic Demonstration programme
- Scheme is managed by the Energy Saving Trust
- Funds 40% to 60% of installation costs
- Small scale applications (less than 5kWp) to be submitted by end December 2004
- Funding for the programme is uncertain but is expected to continue for at least one further year
- Funding can only be accessed by using a registered installer
- www.est/org.uk/solar T 0800 2983978

Energy Saving Trust

dti
Department of Trade and Industry

Grants available: Utility Green funds

- Scottish Power, Powergen, EDF Energy
- Typically provide funding up to around £30k
- Scottish Power has a focus on educational aspects of schemes
- Scheme needs to be visible and Utility company will want to be involved with the publicity and project launch
- Will fund 100% of project costs but prefer to match other funding sources
- Funding rounds tend to be oversubscribed and next round of deadlines are end Dec 2004/Jan 2005

ScottishPower POWERGEN EDFENERGY

Renewable Energy Projects

- Select an appropriate technology
- Research the options available
- Draw up a project timetable
- Obtain quotes from at least 3 installers
- Submit a planning application if required
- Apply for sources of funding
- Involve other staff members, pupils, governors, parents, local community
- Tie the project into other curriculum activities

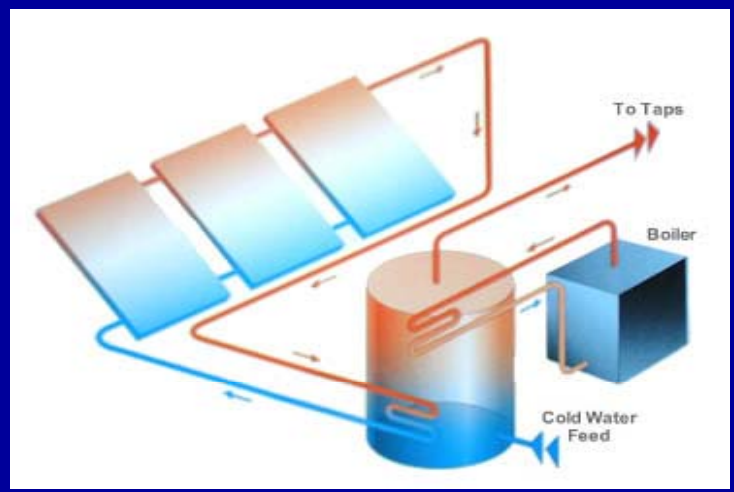
Solar Photovoltaics

- Flat or sloping roof facing South, East or West
- Roof should be free from shading
- Planning permission may be required
- Source of revenue from electricity sales

e.g Ringmer Community College 8kWp, cost £45,000. Annual revenue £350

Solar Thermal

- Flat or sloping roof facing South, East or West
- Roof should be free from shading
- Provides heating for domestic hot water – not central heating
- Requires a hot water store e.g centralised HW system, swimming pool, domestic tank
- Can be used to preheat water for boilers



Biomass

- Can replace existing gas or oil boilers on a like for like basis
- Keep existing boiler as a backup if required
- Need space for woodchip storage
- Need road access for delivery of woodchip
- Identify a source of biomass and enter into a fuel supply contract (similar to gas/oil)
- When is your school's boiler due for renewal?

Wind

- Is the wind speed greater than 6.5 m/s?

http://www4.dti.gov.uk/energy/renewables/technologies/windspeed/

- Are there any buildings/trees that would shelter or provide turbulence?
- Install an anemometer to record wind speeds to assist with turbine selection
- Source of revenue from electricity sales
- e.g Proven 6kW costs £30,000. Annual revenue approx £1,000

- Swift wind turbine will operate at lower windspeeds around 3.5m/s

Ground Source Heat

- Is there a constant demand for low grade heating? e.g under floor?
- Is there a sufficient ground area -approximately twice that of the area to be heated?
- Are any projects planned that will involve breaking this ground? e.g resurfacing playground or car park, field drainage.

Small scale Hydro

- Is there a stream or river nearby?
- How fast does it flow – contact Environment Agency or commission a feasibility study to assess potential
- Permissions from the environment agency are required

- Revenue potential to sell electricity generated from scheme

Useful web links and schools to contact

- www.est.org.uk/schools/links
- www.thecarbontrust.co.uk/energy/pages/page236.asp see publications section
- Brill School, Bucks - Solar Thermal Panels and Wind Turbine
- Ringmer Community College, E Sussex – Solar PV
- Cassop School, Durham – Wind Turbine
- Holy Trinity School, Surrey – Solar PV

Next steps

- Are there any new building projects proposed or in design stage at your school where renewable energy could be incorporated?

- Are there any existing opportunities for a renewable energy project?

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