Creating A CLIMATE FOR CHANGE

St Nicholas Fields

In partnership with

creating space for you

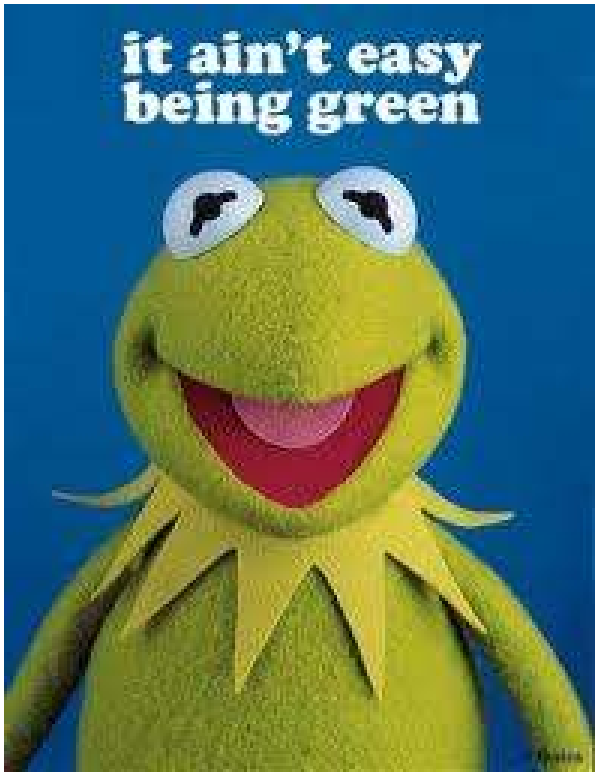
Welcome!

Overview of session:

- Introductions
- Why work sustainably?
- Climate change basics
- Learning from others
- How to make it happen
- Building resilience
- Further support and action planning

http://www.stnicksfields.org.uk/sustainability-projects.php#climate

What does sustainability mean?
What are the benefits?



Climate change basics

What is the difference between weather and climate?

- **Weather** is the temperature, precipitation and wind, which change hour by hour and day by day.

- **Climate** is the typical weather – including temperature, rainfall and other conditions – that occurs over the long term.

  The climate of a particular place is both the ***average*** weather – over a period of at least a decade and generally about 20 to 30 years – and the ***range*** of weather conditions over that timescale.

What is the greenhouse effect?

- The greenhouse effect is the natural process of the atmosphere letting in some of the energy we receive from the Sun and stopping it being transmitted back out into space.
- This makes the Earth warm enough for life.
- For several thousands of years the atmosphere has been delicately balanced, with levels of greenhouse gases relatively stable.
- Human influence has now upset that balance and, as a result, we are seeing climate change.

How are we causing climate change?

- Human activities, like burning coal, oil and gas, have led to an increase in greenhouse gases in the atmosphere, causing an enhanced greenhouse effect and extra warming.
- As a result, over the past century there has been an underlying increase in average temperatures, which is continuing.
- Globally, the ten hottest years on record have all been since 1997.

Which gases are causing the most change?

Carbon Dioxide

- CO_2 has been released in huge quantities by our modern way of life
- Levels have also increased due to the destruction of rainforests, which play an important role in absorbing CO_2

Methane

- Produced by bacteria that live in places like landfill sites, peat bogs and in the guts of animals like cows and sheep.
- Methane does not last for as long in the atmosphere

Nitrous oxide

- **I**ncreased by the use of nitrogen fertiliser in agriculture.

Both these gases have a powerful greenhouse effect, but they have not been released in such large quantities as CO_2

Man-made CO_2 has by far the greatest influence.

What will happen if we don't act to reduce emissions?

If emissions continue to grow at present rates:

- CO_2 concentration in the atmosphere is likely to reach twice pre-industrial levels by around 2050

- global temperature could rise as much as 7 °C above pre-industrial temperature by the end of the century and push many of the world's great ecosystems (such as coral reefs and rainforests) into irreversible decline.

Even if global temperatures rise by only 2 °C, 20–30% of species could face extinction.

What does it mean for the world?

Climate change will mean warmer temperatures, which will:

- change rainfall patterns
- cause snow and ice to melt
- affect the intensity of extreme weather such as storms and heatwaves.

We have already begun to experience some of these impacts and many other knock-on effects.

Water and food

- Around 1.5 billion people currently live in water-stressed regions.

  Climate change and population growth could increase this to 7 billion by the 2050s

- Some areas could become more fertile; others more barren.

- This may lead to regional food shortages, mass migration and poverty.

- Malnutrition is expected to increase in developing countries.

Health

- More frequent and intense heat-waves, floods, storms, wildfires and droughts.
- Deaths from cold-related diseases will reduce.
- Patterns of disease will also change, with wide areas of the world at risk from major diseases.

Environment & Ecosystems

- Coastal areas will experience more flooding from rising sea-levels, especially large river deltas which tend to be highly populated, e.g. the Nile Delta.
- Some areas will attract more tourism as their climates alter.
- Amazonia is already damaged by deforestation. Climate change may magnify this impact by increasing the risk from fire.
- Other areas of high biodiversity, such as in South Africa, may see major losses of species as habitat conditions change.
- Around the world, some animals and plants may benefit and flourish in a changing climate, while others are likely to suffer.

How the UK climate may change?

Rising temperatures

- Under a medium emissions scenario, the annual average temperature rise by the end of the century is very likely to be more than 2 °C and less than 5 °C. The central estimate is 3.5 °C.
- Temperatures are expected to rise across the UK with more warming in summer than in winter.

Droughts

- As summers become warmer and drier droughts are more likely, particularly in the south-east.

Flooding

- There may also be more intense downpours of summer rainfall, which could lead to flash flooding.
- Heavier winter precipitation is expected to become more frequent, potentially causing more flooding.

Heat-waves

- The extreme heat-wave of 2003, where average summer temperatures were 2 °C higher than normal, led to more than 2,000 additional deaths in the UK.
- Such hot summers could happen every other year by the 2040s.

Rising sea levels

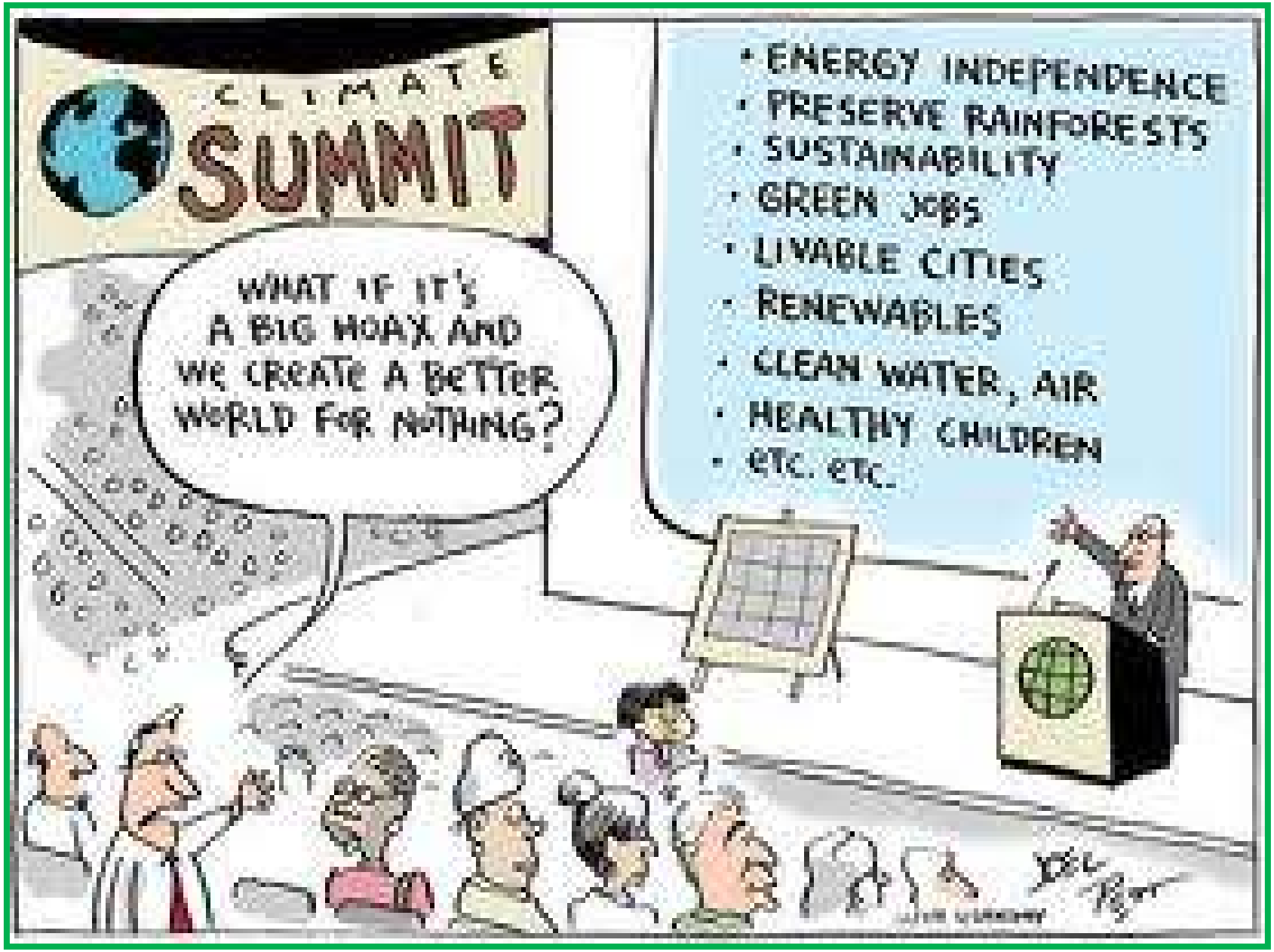
- Sea-level across the UK is projected to rise between 11 and 76 cm by the end of the century.

Do climate scientists really agree about climate change?

Yes!

- The overwhelming majority of climate scientists agree on the fundamentals of climate change — that climate change is happening and has recently been caused by increased greenhouse gases from human activities.
- The core climate science from the Intergovernmental Panel on Climate Change (IPCC) was written by 152 scientists from more than 30 countries and reviewed by more than 600 experts.
- It concluded that most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in man-made greenhouse gas concentrations.

Source: Met Office Climate Change Guide at:
http://www.metoffice.gov.uk/climatechange/guide/quick/evidence.html


CLIMATE
SUMMIT
WHAT IF IT'S A BIG HOAX AND WE CREATE A BETTER WORLD FOR NOTHING?
• ENERGY INDEPENDENCE
• PRESERVE RAINFORESTS
• SUSTAINABILITY
• GREEN JOBS
• LIVABLE CITIES
• RENEWABLES
• CLEAN WATER, AIR
• HEALTHY CHILDREN
• ETC. ETC.

Learning from others

Monitoring energy consumption

How much does fuel cost environmentally?

- Defra CO_2 emission factors for fossil fuels

Fuel	$kgCO_2/kWh$
Gas	0.206
Electricity	0.537
Oil	0.258
Coal	0.313
LPG	0.225

- Oil-9.75 kWh per litre
- LPG-7.08 kWh per litre
- Coal-7.1 kWh per kg

How much does fuel cost financially?

- Electricity is measured and charged by the kWh or unit
- Gas is measured by its volume and this is converted to kWh
- Gas is the cheapest fuel in terms of pence per kWh

How much is your bill?

Understanding energy bills

- What has been paid and when?
- Does the bill show debit or credit?
- Is it an estimated bill?
- How does it compare to the current meter reading?

Key aspects of your bill

Electricity statement

Rate	Present	Previous
Standard	45894 E	45003 A

The letters next to the meter reading represent its source:

- A-Actual reading performed by company representative
- C-Customer reading performed by the customer
- E –Estimated reading produced by supplier

Reading your meters

Why read meters?

- To check you are being billed for actual usage
- To enable you to monitor fuel use over time
- To allow the benefits of energy saving measures and behaviour to be seen over time

Meter types

- Dial meter/digital meter/electronic meter
- Is it clear how to read the meter? - dial meters can be difficult to read

Monitoring and targeting

- First stage of auditing process is analysis of energy data
- Gather at least one year's worth of energy consumption for the property
- Use this to build a picture of the building's energy consumption

Boilers

- Is it standard or combi?
- What is the design efficiency?
  (information plate or SEDBUK database)
- How old is it?
- Is the adjoining pipe work insulated?

Systems and controls

Systems and controls

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Heating

- How well controlled are the heating times?

- Do they represent the usage patterns of the building?

- Is localised control available and being used?

- Set thermostat to appropriate temperature for activity taking place

- Are heaters being maximised-i.e. free of blockages?

- Is all hot pipe work fully insulated?

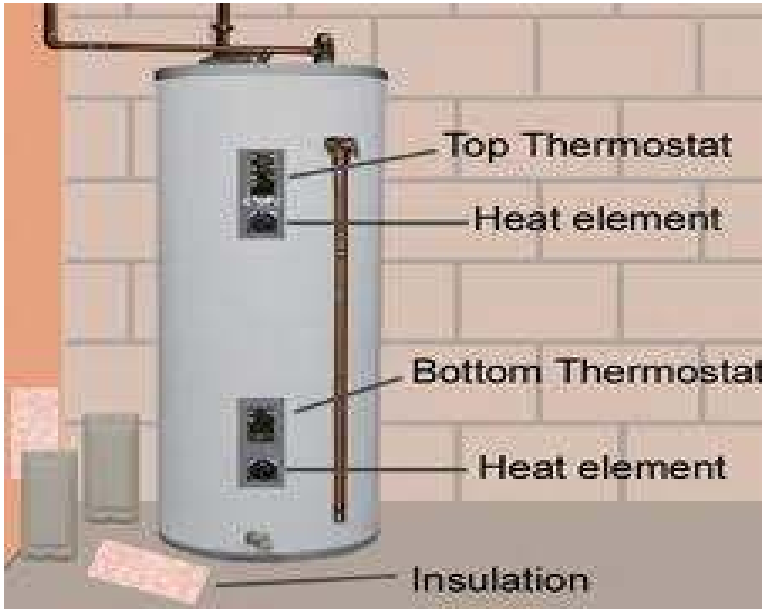
- As long as it's warmer inside than it is outside heat will be lost from a building

  - It is therefore not advisable to leave heating on for long periods if the property is unoccupied *

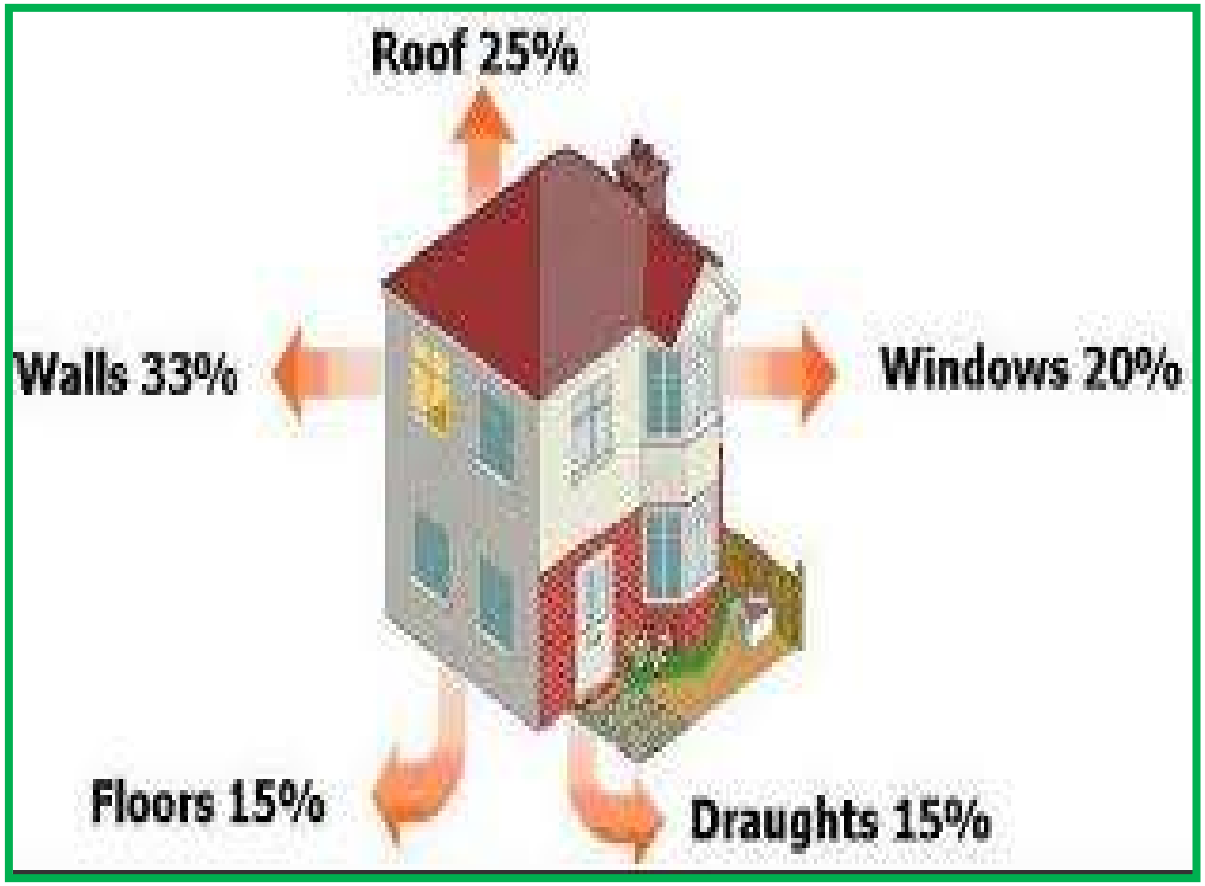
*In winter some heating may be required to ensure pipes do not burst or mould and damp problems occur

Hot water

- How well insulated is the tank?
- Is it on a timer?
- Is it stored at the correct temperature?



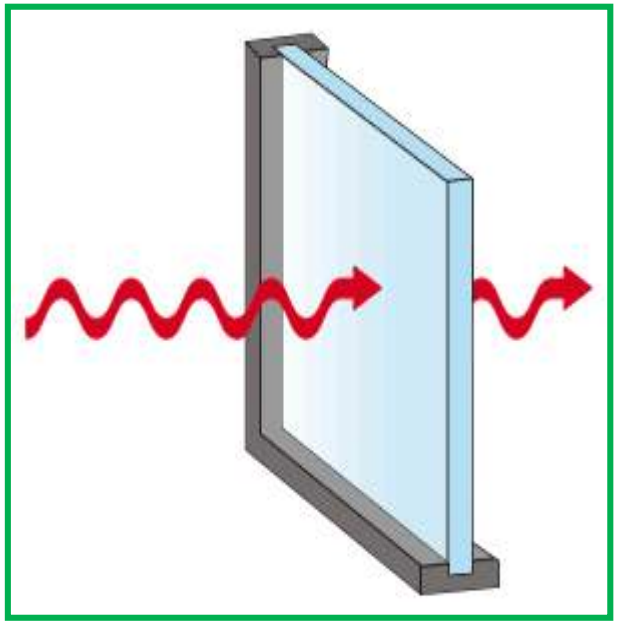
Typical heat losses



Fabric heat loss

Measuring heat loss

- U value: the rate that heat passes through a structure
- Measured in Watts/ per square metre/per degree C
- The lower the U value the better



Cavity walls

Generally adopted by the building trade around 1930

If the building was constructed after 1945 it is likely to have a cavity wall

Measure the depth of the wall.

If it is more than 9” it is likely to have a cavity. wall

Cavity Wall Insulation

Key points

- Takes less than half a day to install
- Heat loss through walls can be reduced by up to 60%

Typical U Values

- Without insulation **1.5**
- With insulation **0.50**

Secondary Glazing

How

- Fit internal panes to existing single glazing unit

Key points

- Similar energy savings to double glazing (but considerably cheaper to install)
- Can usually be fitted in listed buildings where consent for double glazing would be a problem

Typical U Values

- Without insulation 4.71
- With insulation 1.6-2.9

Draught-proofing

How

- Fit draught proofing strips to windows and doors

Materials

- Plastic strips to windows sides and tops of doors
- Brushes on the bottom of doors

Draught-proofing

Some other draught proofing measures

- Block unused chimneys
- Tape over/cover keyholes
- Draught proof letterboxes
- Make your own draught excluders

Reducing lighting costs

Energy efficient light bulbs

- Use 80% less energy than a normal bulb and last 12 times longer
- Can save £50 during their lifetime
- Replace T 12 fluorescent strips with T8s to use 8% less energy
- T5s use 40% less energy but need an adaptor
- Longer hours mean reduced maintenance costs

Reducing electronic equipment costs

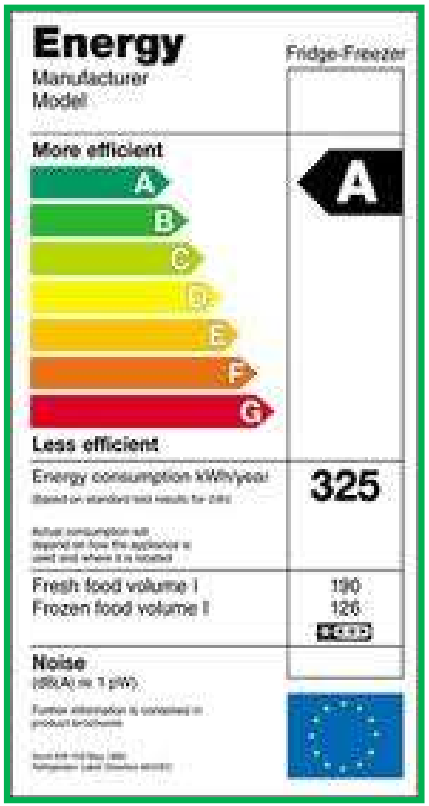
- Majority of the energy consumption of a computer is from the monitor- turn it off when not in active use
- Energy saving features should be enabled
- A photocopier left on overnight uses enough energy to produce over 1500 copies
- Do not leave appliances on standby
- Unplug chargers

Appliances

- White goods European A-G rating
  An A rated fridge can save £45 per year
  compared to an old inefficient fridge

- Boilers: SEDBUK A-E rating

- Look or Energy Saving Recommended
  logo on other goods



Refrigeration

- Refrigerators usually run throughout the year
- A typical cold drink dispensing machine costs £350 a year to run
- Location impacts on the efficiency of the cooling process –
  locate chillers away from heat sources (including sunlight)
- Often set to lower temperature than required
- Ensure door seals are in good condition and condensing coils are clean.

Reducing water usage

- Every 1 cubic metre of tap water requires 1 kWh of energy to produce
- Flow restrictors i.e. spray taps & shower heads
- Water hippos
- Grey water collection
- Water butts
- Remember - always fix the drips!

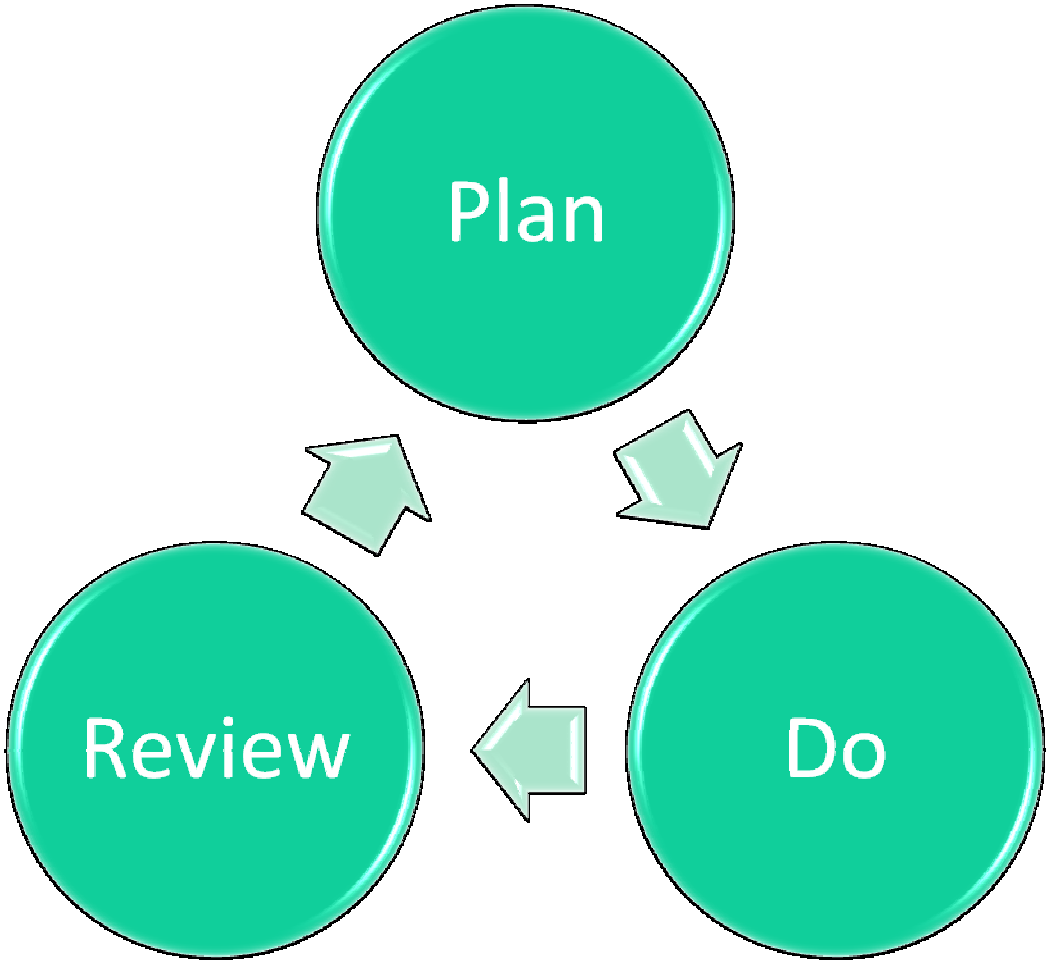
Energy Monitors

Other ways to reduce greenhouse gas emissions

Building resilience

- What does your organisation and your service users depend on?
- How can you adapt your service to minimise that dependency?
- What did we learn from the snow?

Engaging others from your organisation



Ongoing Support
Action Plans

- Toolkit: www.stnicksfields.org.uk
- Climate Change Champions
- Action Plans