

# Actio<sub>2</sub>n Surrey

SURREY'S LOW CARBON COMMUNITY

## All About Energy: Workshop for youth groups

Aim	<p>This session is a fun and interactive introduction to various energy related topics including:</p> <ul style="list-style-type: none"><li>• where our energy comes from</li><li>• how we use it in the home</li><li>• the environmental impacts of various sources of energy</li></ul>
Target age groups	6 - 10
Duration	1 hour (approx)
Group size	10 - 40 children
Materials required	<ul style="list-style-type: none"><li>• Projector</li><li>• 'All about energy' Powerpoint presentation</li><li>• Cards for 'What's Watt' game</li><li>• Information sheets for 'Pros and Cons of Different Energy Sources' group discussion</li><li>• Materials for 'Insulate yourself' game<ul style="list-style-type: none"><li>○ Blanket</li><li>○ Hat</li><li>○ Scarf</li><li>○ Goggles</li><li>○ Slippers</li></ul></li><li>• Energy saving gadgets<ul style="list-style-type: none"><li>○ LED light bulb</li><li>○ Draught-proofing strip</li><li>○ Thermal radiator valve</li><li>○ Motion sensor activated light</li><li>○ Energy monitor</li></ul></li></ul>

## Introduction (2 mins)

Today we're going to talk all about energy: how we use it, where we get it from, and why it's so important too.

To do this, I want to get you all thinking so I'm going to ask you lots of questions. When I ask a question, don't just shout out. Raise your hand and then you can answer so we can all hear.

I'm also going to play some fun games with you later, to get you talking to each other. However, if you see me raising my hand, that means I want you to stop what you're doing, be quiet and raise your hand as well. I'll do this if you're being too noisy! (*PRACTICE THIS WITH GROUP*)

## Where does energy come from? (10 mins)

Now, let's talk about energy. We're using energy in this room right now. That energy is called electricity.

Q I want you all to look around the room and tell me where we are using electricity right now?

A - e.g. audio equipment, computers, lights, heaters etc.

Q How does this electricity get here?

A - Power lines and gas pipes (SLIDE 2)

Q Where is it usually made?

A - Power stations (SLIDE 3)

Q How is it made?

A - Burning fossil fuels i.e. coal/oil (SLIDE 4)

Q What are fossil fuels made out of?

A - Fossil fuels like coal and oil are actually made from the remains of millions and billions of animals and plants that lived millions of years ago that became fossils, turning into coal and oil underground. (SLIDE 5)

Therefore, what is actually powering my computer right now is the remains of things that lived millions of years ago.

Q Why do you think it is bad to burn fossil fuels?

A - They can run out, and they create gases which warm the earth (SLIDE 6)

The gases they release, mainly carbon dioxide, will stay in the earth's atmosphere and cause it to warm up.

You might think that being warmer is great - you can play outside more, you aren't so cold, you can eat lots more ice cream - but a warming planet can cause a lot of problems too.

Q What will happen if we carry on burning fossil fuels and making our planet hotter?

A - Drought, hunger, melting ice caps, floods, extreme weather (SLIDE 7 and 8)

Therefore we probably shouldn't be using very much of this energy

Q Why else should we use less energy?

A - *Its expensive and mum and dad pay for it (SLIDE 9)*

(BLANK SLIDE 10)

So, it's obvious we need to either use less energy, or find new ways of making it that are cheap, don't run out, and don't hurt our environment.

## Your energy use (10 mins)

Let's start by thinking about how we can use less:

Q We already know how we are using energy in this room. Now, can you think of how you use it at home?

A - *Write answers down on the board/flipchart*

Q What simple things can we do to save energy?

A - *Write answers down on the board/flipchart*

Q What things in your house do you think use the most energy?

A - *Write answers down on the board/flipchart*

## 'What's Watt' - Game

- *Distribute cards with household energy using devices etc on them*
- *Tell group to arrange themselves into a line with the highest energy-using items on one end, and the least energy-using items on the other.*
- *Reveal the answers by handing out cards with their kWh use, and cost per use.*

Now I'd like you to think about heat. When it's colder, we use radiators and heaters to make us warm. But often our buildings can't keep this heat in, and it escapes quickly so the room goes cold.

Q Where is all the heat lost out of your house?

A - *Take ideas, then draw on diagram of house to show where heat is lost most – 25% roof, 35% walls, 15% draughts, 15% windows, 10% floors*

Q What can we do to stop losing this heat, so we don't have to use so much to keep warm?

A - *Insulation*

## 'Insulate Yourself' - Game

*Get a volunteer – explain that if they represented a house, at the moment they are very badly insulated.*

1. *Wrap them in blanket – Wall insulation*
2. *Put a hat on them – Roof insulation*
3. *Put on goggles – double glazing*
4. *Put on slippers – Floor insulation*
5. *Put on a scarf – eliminates draughts*

## Energy saving Technology (10-15 mins)

Technology can also help us to stop wasting energy at home.

### Gadgets – Group discussion

To show you how, I would like to split you into 4/5 different groups. I'm going to give each group a gadget which can help us to stop wasting energy at home. I want you to look at it for 5 minutes, then I want you to tell the rest of the class what it is, what it does and how it helps us to waste less energy.

*Split into groups and ask them to figure out what each gadget does, and how it helps them to save energy.*

- *LED lightbulb*
- *Draughtproofing strip*
- *Thermal radiator valve*
- *Motion sensor activated light*
- *Energy monitor*

## Renewables (10-15 mins)

We've now learned how to use less energy, which is good, but we can't stop using it completely. Therefore, we need to change the way we generate energy.

Q Is there a way of generating energy without harming the environment?

A – *solar, wind, wave, wood, biomass etc*

Renewable energy is any energy that is generated in a way that means it won't run out in the future. For example, solar energy is renewable because the sun won't run out. Wind is renewable because the wind won't run out. Wood is renewable because we can plant more trees to replace the ones we have used.

**(SLIDES 11, 12 and 13)**

On the other hand, fossil fuels such as coal are not renewable because we can't make more coal, so if we keep using it we will run out.

**(BLANK SLIDE 14)**

In Britain, one of the technologies we use is solar panels. The part of the panels that can change solar energy into electrical energy is made of silicon, the 2<sup>nd</sup> most common element in the earth's crust. This means there is a lot of it!

There are about 900,000 different places in the UK that have solar panels installed, and that

number is rising all the time.

(SLIDES 15, 16, 17)

## 'Pros and Cons of Different Energy Sources' – Group discussion

Now you know a little bit more about how energy is generated, I want to get you thinking a little more about it.

I'm going to split you into your groups again, and give you each a method of generating energy.

I want you to talk about this for 5 minutes between each other, and make a list of all the good things about your type of energy, and then all the bad things.

*Distribute energy information sheets*

*Energy types to be discussed:*

- Nuclear power station
- Coal/oil/gas power station
- Solar panels
- Wind turbines
- Hydropower
- Biomass
- Geothermal energy

## Wrap-up

Now let's see how much you have learned today.

- Q Can you think of three examples of renewable energy?
- Q Why do we use insulation?
- Q Why is using less electricity from fossil fuels a good thing?

**Actio<sub>2</sub>n Surrey**  
SURREY'S LOW CARBON COMMUNITY

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