

## Teacher notes for activity: Investigating energy technologies

### Resources for this activity

- Powerpoint slides to support activity, including printable support frames (instruction sheet for work on films, note-taking frames), available on [www.ashdenawards.org/schools/activities](http://www.ashdenawards.org/schools/activities).
- Computer suite for viewing films.
- 5-minute Ashden Awards films, available on [www.ashdenawards.org/schools/films](http://www.ashdenawards.org/schools/films). We suggest the following films, but others could be used if preferred.
  - **Cassop Primary School, UK:** using wind and solar electricity, and wood-fuelled heating, and integrating the understanding gained into the curriculum and ethos of the school.
  - **IDEI, India:** using cheap, human-powered treadle pumps, instead of diesel pumps, to supply water for irrigating crops.
  - **GIRA, Mexico:** providing homes and small tortilla business with the 'Patsari' stove, which saves wood and reduces air pollution.
  - **Shaanxi Mothers, China:** generating biogas for cooking and lighting from pig manure and toilets
  - **AID foundation, Phillipines:** pumping clean water from valleys up to hillside communities using water-powered Ram pumps.
  - **Zara Solar, Tanzania:** providing solar-powered electricity for lighting and other services to homes, orphanages and other institutions.
  - **Practical Action, Peru:** using micro-hydro plants to supply electricity to homes and small businesses in remote villages in the Andes.
  - **Ecotricity, UK:** increasing the supply of wind-powered electricity using small wind-farms on industrial sites.

### Curriculum areas and topics

- Main activity: Science, Geography, English, Design technology (DT), Education for sustainable development (ESD), Citizenship.
- Further activities: Science, Geography, English, Design Technology, ESD, Information and computer technology (ICT), Art, DT, Citizenship.
- Links to topics: Energy, Forces, Contrasting localities, Homes, Food

## **Suitability**

- Upper Key Stage Two – age approximately 9 to 11 years.
- Main activity needs two lessons.
- The detailed objectives and approach can be adapted for use with different age groups.

## **Grouping**

Initially, pupils need to be able to work independently, or in very small groups, then collaborate as a larger group to prepare a verbal presentation. Mixed ability groupings may be beneficial here to support and encourage less able pupils to participate. You may wish to have one group working on one film all the time. Alternatively, with older pupils, you might use a flexible grouping in which pupils change over and visit other 'work stations' where other films are being studied. In this way pupils can gather a wider range of data.

## **Background**

This activity involves pupils in using a number of Ashden Awards films to investigate the operation and benefits of different renewable energy technologies. It is a useful introduction to the terminology and application of these technologies. The films provide a rich source of information for pupils, on which they can base their enquiries.

This activity is designed to promote both independent and collaborative learning. It needs to be carried out in a computer suite, so that all pupils, or at least small groups, can have access to a computer to watch a film. Pupils will study one of five Ashden Awards films, each of which shows different renewable energy technologies. Pupils have to gather evidence to answer questions about the films, and report back as a group to the rest of the class in a follow-up lesson.

## **Prior knowledge**

Pupils need to know that energy can be produced from renewable and non-renewable sources, and be familiar with some of the terminology used e.g. wind turbine, biomass, solar. If you know that your pupils have insufficient knowledge of these terms, it will be helpful to start the lesson with a definition activity.

Pupils need to have some experience of working independently and putting together a verbal presentation. They need to follow directions to access the internet, although access could be set up beforehand in the computer suite.

## **Purpose of the activity**

- To be able to talk about different energy technologies and how they affect people's lives.
- To be able to work collaboratively to solve problems.
- To be able to communicate effectively.

## How to use the resources

### Powerpoint introduction

This is a two-lesson activity. In the first session, the activity will be introduced and pupils put into one of five groups. Each group will have the same instructions, with guidance questions for them to follow. The Powerpoint slides have these instructions, which can be discussed as a class first if wished and printed out for use. The Powerpoint slides also have two versions of a support framework for pupils to use for taking notes.

### Films

During the first lesson, pupils should access the films, watch them and make their notes on the answers. They should then collaborate with their group to agree answers and decide how they will report back to the class. It would be helpful for pupils to have access to an interactive mapping tool such as Google Earth to pinpoint locations and use this when reporting back. (See also notes on alternative grouping potential).

### Reporting to the class

In the second lesson, each group will show their 5-minute film and then have 5 minutes in which to make a verbal presentation to the class. As a plenary, each group could be given feedback on their presentation from other members of the class.

### Further activities

- 1) Present findings on the films through other media as well as verbal reporting, possibly linked to further research about the technology or the place involved.  
**Science, Geography, English, ICT, ESD**
- 2) Rank different energy technologies according to how useful and suitable they would be in your school. Discuss why and how they should be incorporated. Identify the best places in the school grounds to site solar panels or a wind turbine and decide how to test ideas.  
**Science, Geography, English, ICT, Mathematics, ESD**
- 3) Research some of the other international Ashden films and build your own database by agreeing relevant categories.  
**ICT, English, ESD**
- 4) Use a world map to locate the different films you have investigated – either using paper based materials or digital mapping software such as Infomapper or Quikmaps.  
**Geography, ICT**
- 5) Design and build a model that will carry out work using some form of renewable energy and test its effectiveness.  
**DT, Science, ESD**

- 6) Design posters or a short video advertorial to describe the benefits of the technology you have studied.

**Art, ICT, English, ESD**

- 7) Discuss how the quality of people's lives has been improved by the technologies you have studied. You could use the 'Thinking about quality of life' activity: the Powerpoint and Teacher notes are available on [www.ashdenawards.org/schools/activities](http://www.ashdenawards.org/schools/activities).

**Citizenship, Geography, ESD**

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