

energy efficiency

web based energy efficiency classroom activities from



SECTION 1: THINKING ABOUT ENERGY

Genesis



What Do We Mean by Energy?

- Through class discussion, find out what the students understand as energy? What does the dictionary say?
 - *what does it do?*
 - *how is it produced?*
 - *what is it used for?*
- What do people mean when they say they have a lot of energy? What 'fuels' the energy that we as humans have?
- In groups have students brainstorm and list the many uses we have for energy.



Spot the Difference

- Introduce the idea that energy we use can come from many sources. Discuss and list the many sources of energy which are used to power the following :
 - *cars and trucks* - *barbeques*
 - *house/office heating* - *cooking*
 - *lighting* - *computers*
- Help students understand the difference between fossil fuels such as oil, gas and coal (these are fuels which are used up/finite resources) and renewable energy.
- Tell students that most electricity in New Zealand is produced by a renewable resource - water. This is called hydro electricity.
- What other forms of renewable energy can the students identify which can be used to produce electricity? eg
 - *wind power* - *solar power* - *tidal power*
- Have students use atlases to locate Martinborough. Tell them that Genesis, a power company, has Hau Nui wind farm near Martinborough which produces electricity from this renewable resource. Why do student think wind power will be an important energy source in the future?



Why We Have Problems

- Remind students that low hydro lake levels in 2001, 2002 and 2003 caused some concern that we would not be able to generate all the electricity that we needed. What were we asked to do? (*Save 10% campaign*).

Technology Curriculum

Learning Intentions:

- **Demonstrating they can gather and collate information on electrical energy usage, at home and at school**
- **Being able to explore possible solutions and develop strategies to use electrical energy more efficiently and prevent wastage**
- **Understanding that adopting energy efficient practices benefits both consumers and New Zealand as a country.**

Skills Used and Developed:

- **Research • Information • Communication**

Further Curriculum Links: Science, English

- Tell students that in years with low rainfall, we may not be able to generate enough electricity to meet demand.



What Solutions Do We Have?

- Tell students that electricity demand is increasing by about 2% every year. If we can't supply electricity to meet demand in 'dry' years, what solutions can the students suggest we can put in place? eg
 - *we can build new power stations*
 - *we can use less electricity*
- Introduce the students to the idea of energy efficiency – this means not wasting electricity and learning how to use it wisely.
- Re-enforce this message of wastage by telling students that in the USA, up to 7 power stations are needed just to produce electricity to power computers which are turned on but not in use.
- Do they know of any obvious examples of energy wastage at school or at home? List for later comparison.

Genesis Hau Nui wind farm near Martinborough





it's in our hands

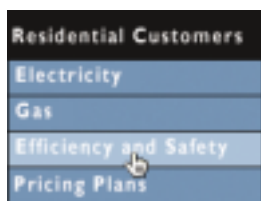
SECTION 2: WEB RESEARCH PROJECT



Introducing the Project

- Introduce the group research project by explaining to the students that energy efficiency means more than turning things off when we are not using them. It means understanding where and how electricity is used in our households

and learning how we can make savings by taking positive steps and learning energy saving tips. Their group task is to find these tips at: www.genesisenergy.co.nz



Mouse over Residential Customers > Click on Efficiency and Safety > Click on Also of interest – Energy audit and efficiency > Also of interest Energy audit & efficiency

- In groups, have students work through each section of the website reporting their findings back on a regular basis.



Ideas and Topics for Discussion

- What factors affect household usage?
- Why is it not as simple as comparing household accounts with a neighbour to find out which household uses energy more efficiently?
- Identify the 'big' users of household energy.
- Focus on insulation. Discuss the reasons why poor insulation greatly increases household energy usage. What simple steps can we take to lessen heat loss from our houses?
- As well as saving money, what other advantage does good insulation have? (greater comfort in winter and in summer, health benefits)
- Are the students surprised by how much can be saved by simply fixing leaky hot water taps? How many leaky taps are there in the class/school?
- Discuss and list the most basic (simple) steps that do not require spending money that can be taken in each room to make a real difference, **eg**
 - cleaning lint out of driers
 - a draught stopper
 - turning off appliances at switch
 - defrosting freezers
 - letting sunlight in for natural heat and warmth
- Categorise other energy saving tips involving upgrading, changing or improving equipment. Have students list these in order of importance. Justify answers.

SECTION 3: DOING SOMETHING ABOUT IT



Investigate, Plan, Act, Evaluate

- Have each student record and design a checklist of the room by room energy saving tips that apply particularly to their household situation, **eg**
 - they may not have a clothes drier or old fridges
 - renovations may be being carried out - time to change!
- As homework projects, have each student carry out an energy efficiency audit at home and report back listing:
 - what energy saving tips are already in place at home
 - what energy saving tips need to be put in to action at home
- Transfer results of the audit onto a large chart representing households in the class.
- Develop the idea that many of these energy saving tips can be easily achieved but that others will need a change of behaviour by members of the household. List these tips in to the two categories.
- Tell students that they can make a difference - the *Make it Click and Slip, Slop, Slap* are just two examples where young people have made a difference to community behaviour.
- Have the class brainstorm solutions as to how they can implement energy saving tips in their household, **eg**
 - design eye-catching household newsletters
 - challenging each member of the household to take 'on board' one simple energy saving tip at a time
 - planning a household treat if energy is saved
 - presenting each household member with an energy saving checklist for the room, and/or appliances they use most
 - a series of fridge reminders of 'energy saving tips of the week'
 - plan and implement an energy saving tips day at school for families. Invite power company representatives, plumbers, electricians, builders to pass on energy saving tips
 - monitor household progress and report back regularly

Genesis

Genesis is a state-owned electricity generator and retailer: Genesis owns the Huntly Power Station, the Tongariro and Waikaremoana Hydro Schemes and the Hau Nui wind farm near Martinborough.

As one of New Zealand's largest energy companies, Genesis Energy has approximately 600,000 electricity and gas customers.