

Clean Energy and the Environment



Name

Class

Student worksheet

1. In the table below, write 5 methods of creating electricity (choose from the [factsheet](#)), and write down at least one good point about it, one bad point about it and one way you would make this method of generating electricity better.

Method	Good	Bad	Better

2. The renewable energy option we are investigating is:

Let's investigate! We want to find out some of the potential problems with this technology and discover some of the new innovations to counter those problems. In the space below, start by noting down the potential problem, and then brainstorm 5 potential solutions. Once you have your ideas recorded, jump online and look for recent news articles and publications about people working towards solving this issue.

3. Issue 1 _____

a) Our proposed solutions

b) Who is working on the issue and what are they doing?

4. Issue 2 _____

a) Our proposed solutions

b) Who is working on the issue and what are they doing?

5. Issue 3 _____

a) Our proposed solutions

b) Who is working on the issue and what are they doing?

Potential Issues with Renewable Energy

Solar Energy:

- Land Use: Large solar farms need a lot of space and can harm the homes of animals.
- Water Use: Some solar systems need water for cooling, which might stress local water resources.
- Manufacturing Emissions: Making solar panels can be harmful to the environment and releases greenhouse gases.
- Waste Management: Getting rid of old solar panels can be hard, especially if not done right.
- Resource Mining: The materials for solar panels come from mining, which isn't great for nature.

Wind Energy:

- Impacts on birds and bats: Wind turbines can cause injury and death if they fly into them.
- Noise and looks: Some think wind turbines are noisy and not pretty to look at.
- Land Use: Even though each wind turbine is small when you put a lot of them together, it can change the area and impact the ecosystems in the area.
- Resource Mining: Materials for turbines, like rare earth elements, need mining, which can have environmental consequences.
- Waste Management: We need to work out how to dispose of the parts of a wind turbine safely when they are not needed anymore

Hydro Energy:

- **Ecosystem Disruption:** Dams in rivers can change the ecosystems and impact the animals and plants in the area
- **Methane Emissions:** When living things die and start to break down in the water reservoirs they can release methane, which is a greenhouse gas.
- **Land Flooding:** Creating these reservoirs can flood land areas that weren't covered in water before.
- **Water Temperature and Quality:** Dams can change water temperature and quality, affecting local species.
- **Siltation:** Dams can trap sediments, which is the solid material in rivers, lakes and oceans composed of rock, dirt and the remains of plants and animals. Normally, this sediment can flow downstream and is good for the health of the waterway. However, in a dam, this sediment gets trapped, which affects downstream ecosystems.

Tidal Energy:

- **Ecosystem Disruption:** These structures can impact marine ecosystems.
- **Navigation:** Tidal energy structures might be a hazard to shipping and navigation.
- **Noise:** Underwater noise from tidal devices can affect marine species.
- **Changes in Sediment Flow:** Changing tidal flows can change how sediment moves in the area. Sediment is the solid material in rivers, lakes and oceans composed of rock, dirt and the remains of plants and animals.
- **Limited Locations:** Not all areas are suitable to use this type of energy, so tidal structures can only go in certain places

Geothermal Energy:

- **Greenhouse Gas Emissions:** Geothermal plants can release some greenhouse gases that were previously trapped beneath the Earth's surface.
- **Water Use and Contamination:** uses a lot of water and can potentially contaminate groundwater.
- **Sinking land:** If we take too much, it can cause the ground to sink in some locations.
- **Seismic Activity:** Using the wrong drilling techniques or locations can bring on events like earthquakes.
- **Resource Depletion:** Geothermal reservoirs can be entirely used up if they are overused

Bioenergy:

- Land Use: Need to use a lot of land for bioenergy crops, which can mean less space for essential food crops and natural habitats.
- Water Use: Needs a lot of water to help them grow, which can put pressure on local water resources.
- Greenhouse Gas Emissions: We need to burn these fuels to make energy, which still produces carbon dioxide
- Biodiversity Loss: Having only one type of plant in a particular space can reduce biodiversity.
- Air Pollution: Burning biofuels can release other greenhouse gases and substances that are harmful to the environment.

Microbial Fuel Cells:

- Efficiency and Scale: These methods aren't efficient enough to make a lot of energy right now.
- Resource Use for Production: Making the parts of microbial fuel cells needs resources.
- Waste Production: When the parts of the structure aren't needed anymore, they can produce waste.
- Long-term Environmental Impacts: The long-term effects of microbial fuel cells on ecosystems are not yet fully understood.
- Potential Release of Modified Organisms: If genetically modified organisms are used, there's a risk of accidentally releasing them into the environment.

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