

The rubbish car revolution – a breakthrough in biofuel technology

- A Most experts agree that we can't continue to depend on petrol to fuel our cars. Not only do emissions from fossil fuels cause ¹global warming, but reserves are running out fast, with some experts estimating that we only have enough petrol left for the next few decades. In recent years, there has been a lot of investigation into alternative energies, and exciting proposals from scientists and environmentalists claim that we can power our vehicles using everyday waste. Could this be the solution to the fuel problem, or are these claims simply rubbish?
- B Aside from electric and hydrogen cars, which tend to be expensive and unreliable, one of the most promising alternatives to petrol vehicles is biodiesel, a liquid fuel which has been in use in countries like Brazil since the 1970s. It is made by mixing vegetable oils from plants, such as soya, with an alcohol ²catalyst to form methyl ³esters, or biodiesel. The advantage of biodiesel is that it can be used in diesel vehicles – either alone or mixed with normal diesel, meaning there's no need to buy a new car. It is also cheaper and safer to produce than hydrogen and allows for more speed than electric cars.
- C Nevertheless, biodiesel is not without its problems. One of the main dilemmas is the 'food or fuel?'

question. Some countries are choosing to use their fields to grow ⁴crops for profitable biofuels instead of food, which is pushing up food prices, causing famine in some places. Also, we simply don't have enough land on the earth to grow the biodiesel crops for all our energy needs. Environmentalists worry that, as we adapt more land to produce biofuels, habitats such as rainforests will be lost, along with the fauna that live in them.

- D Despite these issues, biodiesel may have a future. The answer to our fuel problem may be rubbish – literally. Waste-to-energy technology involves adding bacteria to organic waste such as food and wood, and then leaving these microbes to break the material down into the fatty acids which form the basis of the biodiesel. This innovative approach not only solves the environmental problems caused by rubbish sitting in ⁵landfill sites, but it could end the search for an environmentally-friendly fuel. In addition, it doesn't require farm land, which can be used instead for growing food.
- E It is too soon to tell if biodiesel made from rubbish is the fuel of the future, but with early predictions suggesting that replacing petrol with this alternative could cut global carbon emissions by 80%, we certainly can't afford to throw the idea in the bin.

1 Choose the best answer according to the text.

- 1 Fossil fuels ...
a are about to run out.
b are environmentally friendly.
c contribute to the greenhouse effect.
d such as hydrogen are expensive.
- 2 Alternative fuels ...
a such as hydrogen are not economical.
b can be made from grease and acid.
c cannot be made from all types of rubbish.
d allow for less speed than electric vehicles.
- 3 Biodiesel ...
a can be produced using very little land.
b made from rubbish is good for the environment in more ways than one.
c can be used in special 'green' cars.
d does not allow cars to accelerate rapidly.

2 Match words 1–5 in the text to definitions a–e.

- a plants
 b compounds produced by the reaction between an acid and an alcohol
 c agent that causes or accelerates a chemical reaction
 d large holes in the ground where rubbish is buried
 e increase in the earth's temperature caused partly by the greenhouse effect

3 Find words in the text that mean the same as ...

- 1 combustible organic material, like coal, derived from formerly living organisms. _____
2 stock. _____
3 environmentally friendly fuel sources. _____
4 experts in the issues which affect natural habitats. _____
5 organic acids consisting of a chain of four or more carbon atoms. _____