



## ANGLAIS

### Alternative fuel

Hydrogen holds out hope as an alternative fuel to petrol for transport because there is plenty of it about in the form of water and no greenhouse gases are produced when it is burned. Most big carmakers are examining how it might best be used. Most of the work focuses on designing hydrogen fuel cells that would generate electricity to drive the car, at first, in combination with a petrol engine. This week, a German carmaker, BMW, revealed an alternative approach : an otherwise normal saloon car that can run with a hydrogen-powered internal-combustion engine.

The car has two fuel tanks, one containing petrol and the other hydrogen. The idea is to give drivers the chance of when to use which fuel. A computer manages operations ranging from refueling to switching between fuels, which can be done at the touch of a button on the steering wheel ; the transition is almost seamless and considerably less disruptive than changing gears. The new car has modified fuel injectors that are capable of running with either hydrogen or petrol, and steps have been taken to prevent the fuel damaging the pistons and other metal surfaces within the engine.

Hydrogen contains more energy for its mass than petrol but it also weighs a lot less. Overall, this means that a greater volume of hydrogen is needed to power a car, compared with petrol. The refueling process itself has also required careful attention. Liquid hydrogen has to be kept at  $-253\text{ C}^\circ$  and the area around the nozzle must be sealed to prevent the volatile fluid from evaporating during fuel delivery. When refueling, drivers must complete an automatic docking procedure between nozzle and tank. Both pump and car then begin a digitally choreographed check for leaks. Only once this is complete does the flow of the fuel of liquid hydrogen begin. It takes eight minutes to refuel with six litres of the fuel, enough to drive 200 km (125 miles). Of course, the range of the car is greater than this because the driver can switch to petrol if the hydrogen tank is empty.

Using hydrogen may not prove to be the ultimate in environmentally friendly transport. That is because hydrogen does not exist naturally in its liquid form. Instead it has to be manufactured by splitting water into hydrogen and oxygen. That energy itself must be produced in ways that do not emit greenhouse gases for hydrogen to be a truly green fuel.

The Economist. November 18<sup>th</sup> 2006.  
Alternative fuel.

1- Saloon car = une berline ; nozzle = ajutage



**Epreuve du 1<sup>er</sup> groupe**

22. If something was wrong, the fuse wire.....off electricity.

a) will cut

b) would have cut

c) would cut

d) would be cut

H. Ask the question corresponding to the underlined words.

**(01 mark)**

23. A computer manages operations ranging from refuelling to switching between fuels

III **Writing** Write a passage of about 200 words on one of the following topics

**(05 marks)**

**Topic 1**

In our country, do we need to develop an automobile industry ? Why ?

**Topic 2**

As hydrogen-powered cars are not yet available, should public authorities encourage people to take public transportation, rather than letting them use their own private cars ?