

Compressed air-powered cars

1.

The urgency of environmental issues has stimulated researchers to find solutions for transport that can be environmentally friendly. Everyone knows that one of the main causes of air pollution is transport, which is why car manufacturers have always looked for potential alternatives to fossil fuel powered vehicles. BEVs, HEVs and PHEVs have already become a certainty, even though they can be further improved. But what if we could **step away from** not only the combustion engine but also the electric engine too? What if there could be a way to start an engine just by using air?

2.

Engineers have been engaged in the design of a **compressed-air powered car**, a vehicle that uses a motor powered by compressed air. The car can be driven only by means of air, or by a combination of air and fuel, such as petrol, diesel or ethanol, which is how a hybrid electric vehicle runs. The idea is not new: it dates back to the end of the 19th century when a Frenchman, Louis Mekarski, developed a similar power unit for Paris trams. Unfortunately, the technology had significant drawbacks: firstly, sometimes the stored energy was not sufficient to bring the tram back to the **filling station**; secondly, the compressed air **hoses** tended to **burst**, scaring the tram riders.

3.

The compressed air is stored in a **tank** at high pressure: this tank works as a car engine but it does not need any fuel combustion. A compressed-air engine is a pneumatic actuator that converts the energy of expanding air into mechanical work, just like a steam engine, which uses steam instead of air. Compressing air in a small space is a way to store energy. When the gas (the air) expands again, that energy is released to do work.

4.

A major problem these new vehicles pose is that the performance of their engine can be compared to that of a small motorcycle: they can neither reach a high speed nor travel long distances. Furthermore, they take around four to five hours to refill: high speed refuelling stations have already been designed, but they have high installation costs.

5.

Compressed air cars could be emission-free at the **exhaust** pipe. However, they still depend on the electrical grid, because air vehicles need some way to compress the air into the tank. Therefore, their total environmental impact depends on the emissions produced by the power plant instead of the engine.



to burst: esplodere
 exhaust: tubo di scappamento
 filling station: stazione di rifornimento
 hose: pompa
 to step away from: abbandonare/lasciare
 tank: serbatoio

1  Read the previous text and choose a suitable heading for each paragraph. There are two headings you will not need.

- a. ☐ Performance
- b. ☐ Are they totally green?
- c. ☐ How it works
- d. ☐ Air-powered vehicles
- e. ☐ A piston-free engine
- f. ☐ Driving green
- g. ☐ The dangerous effect of the car's tank

2   Read the text again and take notes about the given elements using the information in the text.

1. Fuel-powered vehicles	Manufacturers are trying to find alternatives to fuel-powered vehicles
2. Air	
3. The end of the 19 th century	
4. Louis Mekarski	
5. A tank	
6. A pneumatic actuator	
7. Five hours	
8. Electrical grid	

3  **PAIR WORK** Discuss the statements below expressing agreement or disagreement.

- 1. Nobody will buy an air-powered car because it won't be fast enough.
- 2. Using public transport could be a better solution.
- 3. Air-powered cars could be used by teenagers instead of motorcycles.
- 4. Big fuel suppliers and producers will try to stop the manufacturing of this kind of car.
- 5. There is a lot of concern about the environment, so people will start using this kind of car in a few years' time.

4   Here are some words related to cars: give a definition for each of them.

- 1. Engine:
- 2. Steering wheel:
- 3. Tyre:
- 4. Exhaust pipe:
- 5. Charging port:
- 6. Fuel tank: