



## The air transports you

**"Visionary", that is how the team of Motor Development International, a long-established company in Luxembourg, and the family of Guy Nègre, qualify this man, engine manufacturer by trade, who decided to launch at the beginning of the 90's in a crazy project: creating a non-polluting vehicle. More specifically, a vehicle powered by a compressed air ...**

"In an engine, the pressure is increased to push pistons. How to do it without combustion, so without polluting? This was the subject of the research that my father started in 1991," explains Cyril Nègre who has just taken up the torch with his mother, Annic, following the recent death of Guy Nègre, and now carries on the project.

From the idea of the compressed air engine that sprang up in 1995, to the introduction of the first vehicle scheduled for next year, to the development of engines and vehicles, their approval and development Of a business thought to be sustainable on all the line, the path travelled was long and often difficult, testifies Annic.



*Cyril and Guy Nègre*

But the game is worth the candle because the project is revolutionary.

The operation of this type of vehicle is simple: they are equipped with a reserve of compressed air used to drive a motor and to turn the wheels. In other words, the compressed air replaces the fuel.

The first advantage: high yields, 68% between reserve and engine output and between 36 and 50% if the compression value is counted, compared with 30% for a traditional engine.

Second advantage: No pollutant emissions NO<sub>x</sub> and no unburned hydrocarbon, which are dangerous for health. And, small compared to electric vehicles whose manufacture of batteries tarnishes the carbon footprint, the air tank is designed to last 20,000 cycles of charging and discharging, which corresponds to the life of the car. Another plus: air can be compressed using renewable resources (wind, sun, sea or river flow, etc.).

The AirPod's autonomy is 120 km in the city, which can be tripled with a minimum fuel injection (0.5 litres / 100 km) used to heat the air between the reserve and the engine. Way to relax it. This combustion takes place at 600 degrees, therefore below the NO<sub>x</sub> production temperature and is continuous and therefore does not produce unburned hydrocarbons.

The production concept has been developed with a vision as durable as compressed air technology. "Our philosophy is that our products must be not only ecological but also accessible to all, otherwise their impact will be minimal even if they perform well. We cannot therefore consider these vehicles separately from their production concept, because they must be economical to buy and use," says Cyril Nègre.

The solution found by MDI is to produce locally, that is, instead of manufacturing hundreds of thousands of cars in a large factory, MDI will deploy several small units, of which 5,000 or 6,000 vehicles will be released annually. These units will be both production sites and dealers. "By selling directly to the place of production, we eliminate intermediaries, as well as CO<sub>2</sub> emissions related to logistics and transport from elsewhere, and de facto reduces the cost of vehicles," says the new director of MDI. The initial purchase price will be between 7,000 and 9,000 euros for the AirPod, which is a compact two-seater urban vehicle, and between 4,500 and 5,000 euros for the entry-level AirOne, which is a modular low cost 3 or 5 seater vehicle. But the industrial concept is such that the higher the volume produced, the lower the prices will be. Learn more about the different models: <http://www.mdi.lu/#!produits/e6q7o>

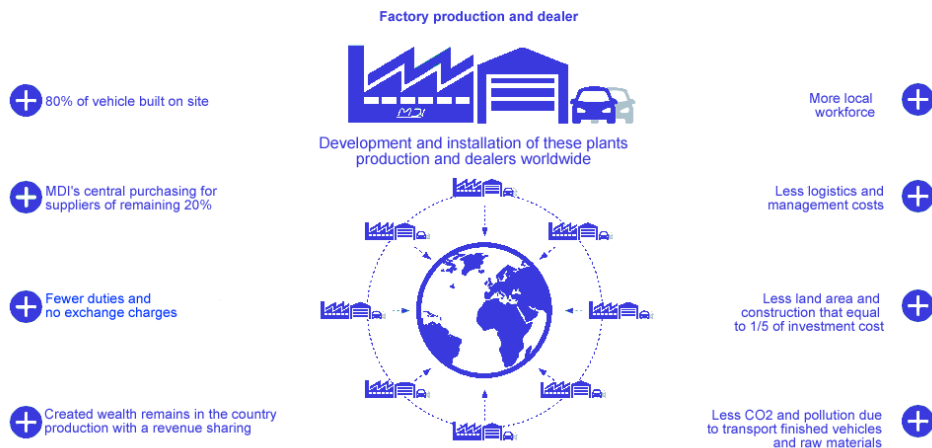


AirOne

"In small manufacturing plants, we can also use the composite material that is profitable only up to 10,000 or 15,000 units per year and whose lightness makes it possible to increase the yield", he continues. To go even further, it is planned to replace, for some models, fiberglass and polyurethane foams with linen fibres from scrap of the textile industry. The loop is completed: in this process, the materials are natural, fully recyclable and they come from a waste reclamation process.

#### Many small factories.

Unlike conventional automakers that centralize their vast manufacturing plants, MDI develops multiple small production units in 5 continents. The advantages of this concept are numerous:



The project is now at a pivotal point from the end of development to implementation. In the second half of 2016, the AirPod 2.0 vehicle will be homologated and by the beginning of next year, the first batch of vehicles will come out of a factory in Sardinia. Most are already booked.

It should be noted that thanks to the research that has been carried out on the performance of air-relaxation, this technology is also competitive in the field of energy storage, enabling it to bypass the ecological and geopolitical problems Lithium, opening up new horizons to MDI.

*Photo Credit: Motor Development International*

**Mélanie Trélat**