As is the case with many alternative drive systems, the history of the fuel cell is also strewn with setbacks. As long ago as 1966, General Motors converted a van to use a fuel cell, generating an output of 160 kW – a remarkable amount of power at that time. Four years later, Karl Kordestsch converted an Austin A-40 to fuel cell power. Its output of 6 kW, however, was only sufficient for a top speed of 45 km/h.

At the end of the 1990s, several car companies invested heavily in fuel cell technology. Both Daimler and General Motors announced that their systems would be ready for series production in 2004. MAN Nutzfahrzeuge cooperated with Linde, while BMW intensively pursued the vision of hydrogen combustion in a piston engine.

In an interview with the financial newspaper Handelsblatt, the then head of research and development at General Motors declared: „By the end of this decade, we will have supplied a significant number of vehicles equipped with a fuel cell powertrain, and this will launch the mass market.” GM planned to be the world’s first carmaker to supply one million hydrogen-fuelled cars. „Perhaps we will even manage this by 2010,” Burns went on. By 2020, cars with fuel cell powertrains were to make up 50 % of newly registered vehicles [1] – according to today’s knowledge, this is impossible.

In the course of the decade, things quietened down at first. From 2005 onwards, public attention was instead focused on hybrid vehicles and then on electric vehicles. A company like MAN even announced that it no longer intended to continue developing fuel cell technology.

The industry was therefore all the more surprised to hear that, in spring 2009, Daimler and Linde had formed an alliance to develop the technology, which had almost been given up as lost, to series production readiness in the foreseeable future.
At the opening of this year’s Aachen Colloquium on Vehicle and Engine Technology, Daimler’s chief executive Dieter Zetsche confirmed his plans to offer fuel cell powertrains for the price of a conventional passenger car drivetrain as early as 2015. “We are well on the way to achieving this target,” Zetsche said. The fuel cell was far superior to the traction battery, he added. Although economies of scale were also to be expected for lithium ion batteries in the future, these would be partly offset by price increases for the most important raw materials, he pointed out. In the past six years, there had been a fourfold increase in the price of lithium carbonate, he said [2].

Studies carried out by the Fraunhofer Institute for Systems and Innovation Research have shown that, depending on the price of crude oil, a fuel cell vehicle can be cost-neutral for the end consumer even if its price is higher than that of a car with a conventional powertrain [3]. For example, a fuel cell vehicle costing an additional 2000 euros would be cost-neutral as soon as the crude oil price exceeded 130 euros a barrel [4]. An additional requirement, however, is that 50% of the hydrogen required is produced from regenerative energy sources.

As the fuel cell can be used as an on-board electricity generator only if there is a sufficient infrastructure of hydrogen filling stations, Daimler and Linde looked for further allies. Shortly before the German parliamentary election, nine car manufacturers signed a joint declaration on the development and market launch of electric vehicles with a fuel cell drivetrain [4]. Besides Daimler, other manufacturers involved are Ford, General Motors/Opel, Honda, Hyundai, Kia, the Renault/Nissan alliance and Toyota. According to the Letter of Understanding, the car manufacturers concerned were confident of the commercialisation and market launch of fuel cell vehicles from 2015. They estimated a volume of several hundred thousand vehi-