



Press Release

OMV opens Baden-Württemberg's first public hydrogen filling station for emission-free mobility of the future

- A cooperative project of the companies OMV, Linde, and Daimler subsidised by the State of Baden-Württemberg
- A hydrogen filling station with new filling technology for enhanced user-friendliness and extended operating range
- Use of hydrogen in fuel-cell technology for environmentally friendly vehicle generations

Stuttgart, 17 June 2009 – On the site of the OMV service station at Stuttgart Airport, OMV in cooperation with Linde AG and Daimler AG is opening Baden-Württemberg's first publicly accessible hydrogen filling station on 17 June 2009. This successful cooperation between the participating companies is subsidised by the State of Baden-Württemberg. The project is centred on the use of hydrogen as an environmentally friendly energy carrier. Hydrogen filling stations represent an important step toward reducing dependence on fossil fuels in the long term and are a step closer to emission-free sustainable mobility. The innovative hydrogen filling station will serve fuel-cell vehicles of the latest generation, such as the Mercedes-Benz B-Class F-CELL, with 700-bar high-pressure technology. Small-series production of this vehicle is to commence later this year in Germany.

The proximity of the OMV service station to Stuttgart Airport – a major transport hub – and to Daimler AG's research and development centres, together with the cooperative contact between the two companies, is providing the basis for the establishment of Baden-Württemberg's first publicly accessible hydrogen filling station. Within the framework of a public-private partnership, the hydrogen station will provide an important impulse for a future supply network for this German federal state, thus supporting the operation of local emission-free electric vehicles on the basis of fuel-cell technology.

“The development of new drive technologies is crucial to Baden-Württemberg’s automotive industry and will ensure that it can emerge with renewed strength from the current crisis and participate in the race for international technological leadership. Hydrogen technology plays a decisive role here. By entering the field of hydrogen technology we are protecting natural resources, while at the same time reducing our dependence on the import of fossil fuels. This initiative is a key component of Baden-Württemberg’s sustainability strategy: by utilising energy in a future-proof way, we are promoting environmentally friendly and thus sustainable mobility,” said Baden-Württemberg’s State Premier Günther H. Oettinger of the joint project. The federal state was therefore supporting this project with the sum of EUR 800,000 from the programme “Zukunftsoffensive Baden-Württemberg” (Baden-Württemberg’s Campaign for the Future), Oettinger continued.

As a leading gas supplier and the world’s largest manufacturer of hydrogen facilities, Linde has a wealth of expertise throughout the hydrogen value-creation chain – from hydrogen production to filling technology. This company, the world’s pre-eminent outfitter of hydrogen filling stations, distributes filling technology in 15 countries. The new hydrogen station at Stuttgart Airport incorporates ion-compressor technology developed by Linde. With this new compression process, cars and electric buses powered by fuel cells can be refuelled within a matter of minutes – just like vehicles powered by conventional internal combustion engines – with hydrogen at a pressure of either 350 or 700 bar. The gaseous hydrogen is also supplied by Linde AG. Operation with hydrogen produces only electrical energy along with water vapour. No hydrocarbons or sulphur oxides are generated – and not even carbon dioxide (CO₂), which arises during combustion of fossil fuels. Hydrogen as a fuel for automotive drive technologies is free of emissions detrimental to the climate and to the environment in both its production from renewable energy carriers and in its transformation into electricity. “As the pioneer of hydrogen technology we have a particular responsibility to press ahead toward hydrogen-based sustainable mobility,” said Dr Aldo Belloni, member of the Executive Board of Linde AG. “Establishing the infrastructure for this future-oriented energy carrier calls for a concerted effort among the partners involved. We are delighted to have realised a filling-station concept of the latest generation together with OMV. With our newly developed 700-bar technology, vehicles can be refuelled rapidly, safely and in a user-friendly manner.”

“Our fuel-cell vehicles have already demonstrated their suitability for everyday operation. To turn emission-free driving into reality, we now need a comprehensive network of hydrogen filling stations,” said Dr Thomas Weber, member of the Board of Management of Daimler AG with responsibility for Group research and Mercedes-Benz Cars development. “We therefore wholeheartedly welcome and support the initiative of OMV.” Daimler already presented the first fuel-cell vehicle in 1994; the Group has since invested more than EUR 1 billion in fuel-cell development. With more than 100 test vehicles and around 4.4 million kilometres covered, the Stuttgart carmaker has one of the largest fuel-cell fleets in the world. The start of small-series production of the B-Class F-CELL, planned for 2009, is now continuing the success story of this drive concept.

OMV operates around 400 filling stations in Germany, with a clear focus on the south of the country with the two federal states of Bavaria and Baden-Württemberg, along with further filling stations in the states of Thuringia and Saxony. The hydrogen filling station project at Stuttgart Airport is the first of its kind in Germany for OMV. “OMV is already intensively dealing today with the mobility of tomorrow. In our function as energy providers we have a responsibility with regard to the fuels of the future. Hydrogen, currently in the development and testing phase, is one of the possible alternatives for the mobility of the future,” said Dr Gerhard Roiss, deputy chairman of the Executive Board of OMV Aktiengesellschaft. “We are therefore very happy to be able to support Daimler’s research and development activities with our new hydrogen filling station, together with the State of Baden-Württemberg.” The project is being supported by the OMV Future Energy Fund, established in June 2006 as an independent organisation for the financial support of projects for renewable energy forms, with a contribution of more than EUR 100 million. With HyCentA (Hydrogen Centre Austria), a further project of OMV with headquarters on the campus of the Technical University of Graz, the energy supplier has long since been gathering invaluable experience in the future-oriented field of research and development with hydrogen technology.

Further background information

Hydrogen production:

The hydrogen required for the filling station is generated in what is known as the steam-reforming process: In the steam reformer, hydrogen, carbon monoxide, and carbon dioxide are initially produced at high temperatures from natural gas and water vapour in a reactor. In the following stage, steam is added to convert the carbon monoxide into carbon dioxide and hydrogen.

The hydrogen fuel derived by this means already leads to carbon dioxide savings of up to 30 percent, as compared with modern diesel vehicles (basis of comparison 120 g CO₂/km). Nevertheless, in the medium to long term, there will be no substitute for hydrogen production from renewable energy sources. The Linde Group is currently carrying out intensive work on innovative solutions for sustainable hydrogen production. An important step towards the marketable production of regenerative hydrogen has been reached with a new process for deriving hydrogen from biogenic raw materials. For this purpose Hydromotive GmbH, a subsidiary of The Linde Group, will establish a demonstration unit for the production of hydrogen from glycerine in Leuna, Saxony-Anhalt, in the middle of this year. Glycerine, a by-product arising in the manufacture of biodiesel, can therefore be put to practical use. The hydrogen generated this way generates carbon-dioxide savings of up to 90 percent compared with a conventional drive unit. Further approaches to regenerative production, such as hydrogen production from wind and solar energy through electrolysis, or biochemical and thermo-chemical generation from algae, are also being pursued by The Linde Group; these are promising prospects as long as the local conditions are appropriate.

In a project not connected with Linde, the State of Baden-Württemberg has also promoted the development of gasification technology and will be subsidising a demonstration unit near Geislingen as of 2010. In this unit, biomass – for example scrap wood – is gasified in the AER (absorption-enhanced reforming) process to yield a gas with very high hydrogen content.

Fuel cell operation:

The B-Class F-CELL is fitted with a fuel-cell drive unit of the latest generation and is thus both far more compact and more powerful than previous fuel-cell systems. The newly devised stack, although around 40 percent smaller, has a 30 percent higher output; with a 16 percent lower consumption, this unit is highly efficient. The B-Class F-CELL also has favourable cold-starting ability. This is made possible by innovations such as the electric turbocharger for air supply and the new moisturising and de-moisturising systems. The electric motor develops a peak output of 100 kW/136 hp and a maximum torque of 320 newton-meters. The B-Class F-CELL thus fulfils high driving dynamic requirements that exceed the level of a two-litre gasoline car, and attains an operating range of up to 400 kilometres.

The functional principle of the proton exchange membrane fuel cell (PEMFC):

The fuel cell is a galvanic cell that converts the reaction energy of an introduced fuel (e.g. hydrogen) and an oxidant (e.g. atmospheric oxygen) into electrical energy. A fuel cell is not an energy storage medium like an accumulator battery, but an energy converter. The proton exchange membrane fuel cell normally uses hydrogen as an energy carrier and attains an efficiency factor of around 60 percent. The key element of the PEMFC is a polymer membrane that is permeable only to protons (H⁺ ions), the so-called proton exchange membrane (PEM). The oxidant, usually atmospheric oxygen, is thus spatially separated from the reducing agent, hydrogen. The fuel, in this case hydrogen, is catalytically oxidised at the anode and releases electrons to form hydrogen ions (protons), which pass through the ion exchange membrane into the chamber with the oxidant. The electrons flow out of the fuel cell via an electrical consumer, e.g. an electric motor, to the cathode. At the cathode the oxidant, in this case oxygen, on binding the electrons is reduced to anions, which react directly with the hydrogen ions (protons) to produce water. Along with electrical energy this reaction also generates heat, which can be used for example to heat the vehicle.

The hydrogen filling station structure in Germany:

The establishment of a public hydrogen infrastructure is crucial to the successful introduction of hydrogen-powered vehicles. The first centres (“clusters”), such as those in Berlin and Hamburg, have already been established. Of the currently nearly 30 hydrogen stations in Germany, six are integrated into public filling-station operations. Germany is

thus the European pioneer. The cooperative project being carried out at Stuttgart Airport's OMV filling station is now Germany's seventh publicly accessible hydrogen station and the first in the State of Baden-Württemberg. Operation of public hydrogen filling stations will only become economically viable once a sufficient number of hydrogen-powered vehicles are on the roads. Achieving a broad-based market introduction and establishing a public infrastructure will require a coordinated, cooperative and long-term three-stage approach involving all interest groups.

First: Focused cluster formation – demand-based grouping in urban areas for technically and economically appropriate capacity utilisation. Five to ten filling stations are already sufficient to cover the initial requirements of a large city.

Second: Corridors – connecting the urban clusters by means of corridors along the main arteries. Here, too, initial plans have been drawn up, e.g. for linking the Berlin and Hamburg H₂ clusters along the autobahn.

Third: Comprehensive area coverage.

The corporations

OMV Aktiengesellschaft

With Group sales of EUR 25.54 bn and a workforce of 41,282 employees in 2008, OMV Aktiengesellschaft is one of Austria's largest listed industrial companies. As the leading energy group in the European growth belt, OMV is active in Refining and Marketing (R&M) in 13 countries. In Exploration and Production (E&P) OMV is active in 17 countries on four continents. In Gas & Power (G&P) OMV sells approximately 13 bcm gas per year. Via Baumgarten, one of the most important turntables for gas in Europe, approximately 66 bcm gas is transported annually. OMV's Central European Gas Hub is amongst the three largest hubs in Continental Europe.

OMV is the leading energy group in the European growth belt with oil and gas reserves of approximately 1.2 bn boe, daily production of around 308,000 boe and an annual refining capacity of approximately 26 mn t. OMV now has 2,477 filling stations in 13 countries. The market share of the group in the R&M business segment in the Danube Region is now 20%.

OMV further strengthened its leading position in the European growth belt through the acquisition of 41.58% of Petrol Ofisi, Turkey's leading company in the retail and commercial business.

In June 2006, OMV has established the OMV Future Energy Fund, a wholly owned subsidiary to support projects in renewable energy with more than EUR 100 mn to initiate the change from a pure oil and gas group to an energy group with renewable energy in its portfolio.

Daimler AG

Stuttgart, Germany-based Daimler AG, with its businesses Mercedes-Benz Cars, Daimler Trucks, Daimler Financial Services, Mercedes-Benz Vans and Daimler Buses, is a globally leading producer of premium passenger cars and is the global market leader for heavy- and medium-duty trucks and buses. The Daimler Financial Services division has a broad offering of financial services, including vehicle financing, leasing, insurance and fleet management. Daimler sells its products in nearly every country and has production facilities on five continents. Founders, Gottlieb Daimler and Carl Benz, continued to make automotive history following their invention of the automobile in 1886. As an automotive pioneer, Daimler and its employees willingly accept an obligation to act responsibly towards society and the environment and to shape the future of safe and sustainable mobility with groundbreaking technologies and high-quality products. The current brand portfolio includes the world's most valuable automobile brand, Mercedes-Benz, as well as smart, AMG, Maybach, Freightliner, Western Star, Mitsubishi Fuso, Setra, Orion and Thomas Built Buses. The company is listed on the stock exchanges in Frankfurt, New York and Stuttgart (stock exchange abbreviation DAI). In 2008, the Group sold 2.1 million vehicles and employed a workforce of over 270,000 people; revenue

totaled €95.9 billion and EBIT amounted to €2.7 billion. Daimler is an automotive Group with a commitment to excellence, and aims to achieve sustainable growth and industry-leading profitability. For more information, see Daimler online at www.media.daimler.com

Linde Group

The Linde Group is a world leading gases and engineering company with almost 52,000 employees working in around 100 countries worldwide. In the 2008 financial year it achieved sales of EUR 12.7 billion. The strategy of The Linde Group is geared towards sustainable earnings-based growth and focuses on the expansion of its international business with forward-looking products and services. Linde acts responsibly towards its shareholders, business partners, employees, society and the environment – in every one of its business areas, regions and locations across the globe. Linde is committed to technologies and products that unite the goals of customer value and sustainable development.

For more information, see The Linde Group online at <http://www.linde.com>

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