Joint Press Release

NEW TOTAL HYDROGEN FILLING STATION IN KARLSRUHE UNITES MOBILITY AND RENEWABLE ENERGY

- **German Hydrogen (H_2) gas station network grows to 33 locations**
- **Daimler, Linde and TOTAL reaffirm their commitment to the clean fuel**
- **On-site H_2 production using innovative electrolysis technology and solar energy**
- **An important step on the road to carbon-neutral electromobility**
- **Federal Ministry of Transport and Digital Infrastructure approved grants of approx. €970,000 for the station**

Karlsruhe, 6 September 2017 – A new hydrogen filling station in Karlsruhe adds further impetus to the building of an infrastructure for eco-friendly electric mobility using hydrogen (H_2) and fuel cell technology. The TOTAL filling station on Karlsruhe's Südtangente ring-road was commissioned on Wednesday. The Federal Ministry of Transport and Digital Infrastructure approved grants of approx. €970,000 euros for the hydrogen facility under its National Innovation Program for Hydrogen and Fuel Cell Technology (NIP). This H_2 filling station – the eleventh in the TOTAL network and the tenth in the German federal state of Baden-Württemberg – is distinguished by an innovative energy concept: hydrogen is produced on-site through electrolysis, using the electricity generated by a solar array. This is one example for how renewable energy can be used in transport.

Fuel-cell vehicles, which use hydrogen to generate the electricity that drives their electric motor, are an important component for the electromobility of the future. Their advantages are long ranges exceeding 400 kilometres, and refuelling times of under five minutes. Operating a hydrogen-powered fuel-cell vehicle generates no local pollutants or carbon dioxide (CO_2) emissions – which is why most leading carmakers are working on this technology. Daimler will soon be unveiling its latest generation of fuel cell vehicles based on the Mercedes-Benz GLC.

In the Clean Energy Partnership (CEP), the public and private sectors jointly laid the cornerstone for building a network of filling stations in Germany. Daimler is the investor behind the facility in Karlsruhe; the refuelling technology comes from Linde. The station will be operated by H_2 MOBILITY, a new joint venture formed by the industry partners Daimler, Air Liquide, Linde, Shell, OMV and TOTAL in order to expand the nationwide hydrogen network to as many as 400 stations by 2023.

Norbert Barthle, State Secretary at the Federal Ministry for Transport and Digital Infrastructure, said: "Our support for the ramp-up of alternative drives is technology-agnostic. We want to be at the forefront of shaping the development. In this process, fuel cells are a key technology in turning the tide towards electromobility. Fewer emissions, quick refuelling, and a long range are the future of electric mobility. Each new hydrogen filling station takes us one step further in

building a nationwide charging infrastructure. This helps us bring more clean vehicles onto our roads and ensure more mobility with fewer emissions."

TOTAL has been involved in developing the hydrogen infrastructure in Germany for 15 years. "Especially now, just before the International Automobile Exhibition, it is important for us to send a signal for hydrogen mobility with this service station. Fuel-cell vehicles are environmentally friendly, with long travel ranges and short refuelling times," said the Managing Director of TOTAL Deutschland GmbH, Bruno Daude-Lagrave. "By using the electricity from a solar array to produce hydrogen, we show how tomorrow's climate-neutral mobility can work." Other hydrogen projects at TOTAL are under construction or in planning in Cologne, Ingolstadt, Hamburg, Leipzig, Potsdam, Neuruppin and Hasbergen.

Christian Mohrdieck, Director Fuel Cell at Daimler AG, declared at the opening ceremony: "The countdown has begun. In a few days, we will present our next-generation fuel-cell vehicles based on the Mercedes-Benz GLC. Battery and fuel cell technology, combined in an all-electric plug-in hybrid – this is unprecedented anywhere in the world. A rapid expansion of the H_2 filling station network is thus especially important to us. The number of H_2 petrol stations in Germany will increase rapidly, not least as a result of our H_2 MOBILITY joint venture's concrete development plans, and the everyday mobility of hydrogen mobility will continue to rise."

H_2 MOBILITY is planning to commission further hydrogen filling stations in the months ahead and recently issued a call for proposals for additional filling-station locations: several stations are to be built in regions with the largest potential hydrogen sales for fuel-cell cars (700 bar). Nikolas Iwan, Managing Director of H_2 MOBILITY GmbH & Co. KG, said: "H_2 MOBILITY has been tasked with building and operating a hydrogen infrastructure across Germany. This is unique: nowhere in the world is there a comparable business initiative that solves the chicken-and-egg problem so sustainably. By the end of 2018, 100 hydrogen stations will ensure a basic supply. If the introduction of hydrogen as a fuel is successful and the number of fuel-cell cars continues to grow, we will expand the network to as many as 400 hydrogen stations by 2023."

Markus Bachmeier, Head of Hydrogen Solutions at Linde, said: "This is an exciting time for hydrogen mobility, as both the infrastructure and the range of vehicles are growing by leaps and bounds. Linde will continue to advance the entire spectrum of clean H_2 technology – from production to application."

'Green hydrogen' from electrolysis powered by solar energy

This hydrogen filling station marks the first time that a steam electrolysis plant in flexible operation is used for the production of hydrogen. It is funded by the state of Baden-Württemberg's BWPLUS program and administered by the European Institute for Energy Research (EIFER). Steam electrolysers are excellent for converting electrical energy into chemical energy. Due to their high operating temperatures of up to 850°C and the possibility of

supplying the required energy in the form of heat, significantly higher electrical efficiencies can be achieved than with low-temperature electrolysers.

“This project allows EIFER to research steam electrolysis technology, which has been tested and evaluated at the cell and stack level in our laboratories for several years now, at the systems level as part of its industrial application,” explains Dr Annabelle Brisse, who heads the EIFER project ‘Electrolytic Hydrogen’.

The scientific monitoring of the hydrogen filling station will involve testing the electrolyser’s load-sequence operating capability of over 5000 hours. Using a monitoring system, all of the facility’s system parameters will be recorded, and then evaluated and analysed by EIFER. As the supplier of the electrolysis facility, the Dresden company Sunfire is working to bring renewable energies into the mobility sector in an efficient way. “This can happen directly as hydrogen at the filling station, or by supplying green hydrogen, synthesis gas or synthetic crude oil substitute (e-Crude) to refineries for the production of traditional fuels for combustion engines based on water, green electricity and CO_2,” said Nils Aldag, Chief Commercial Officer at Sunfire. “The hydrogen filling station in Karlsruhe provides outstanding proof that Sunfire’s electrolysis technology is very versatile.”

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About NOW
The NOW GmbH National Organisation for Hydrogen and Fuel Cell Technology was founded in 2008 by the German federal government, represented by the Federal Ministry of Transport and Digital Infrastructure. It coordinates two federal funding programs – the National Innovation Program for

Hydrogen and Fuel Cell Technology (NIP), as well as the Electromagnetic Compatibility Directive of the BMVI. Both programs serve to prepare the market in order to make mobility and energy supply efficient and low-emission in the future. In addition, NOW supports the Federal Ministry of Transport and Digital Infrastructure with regard to the implementation of infrastructure for electromobility and the further development of the overall mobility and fuel strategy. www.now-gmbh.de

About Daimler AG

Daimler AG is one of the most successful automobile companies in the world. With its Mercedes-Benz Cars, Daimler Trucks, Mercedes-Benz Vans, Daimler Buses and Daimler Financial Services lines of business, the vehicle manufacturer is among the largest suppliers of premium passenger cars, and is the world's largest globally established manufacturer of commercial vehicles. As a pioneer in automotive engineering, Daimler shapes the future of mobility even today. The company is focusing on innovative and green technologies, as well as on safe, high-quality vehicles that fascinate and inspire [their drivers]. Daimler systematically invests in the development of alternative drives – from hybrid vehicles to pure electric vehicles with a battery or fuel cell – with a view to enabling zero-emissions driving in the long term. Beyond this, the company is resolutely advancing accident-free driving and intelligent networking, through to driverless cars/autonomous driving. Daimler sees its responsibility towards society and the environment as both a claim and an obligation. In 2016, the Group, with its 282,488 employees, sold approximately 3 million vehicles, generating revenue of €153.3 billion and EBIT of €12.9 billion. www.daimler.com

About the Linde Group

In the 2016 financial year, The Linde Group generated revenue of EUR 16.948 bn, making it one of the leading gases and engineering companies in the world, with approximately 60,000 employees working in more than 100 countries worldwide. The Linde Group's strategy is geared towards long-term profitable 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. The company 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 www.linde.com

About TOTAL

TOTAL is a globally active, integrated producer and supplier of energy, a leading international oil and gas company, and one of the largest protagonists in solar energy with SunPower and TOTAL Solar. Our 98,000 employees are committed to better energy that is safer, cleaner, more efficient, more innovative, and accessible to as many people as possible.

In Germany, TOTAL has the largest third-largest petrol station in the country, with around 1,200 stations, offering a wide range of energy and mobility services, with the sale of heating oil and liquefied petroleum gas, lubricants, fuels for air and maritime shipping, bitumen and special products for industry. The Group also operates one of Europe's most state-of-the-art plants for crude oil processing, the TOTAL Central Germany refinery in Leuna. The distribution of SunPower natural gas and solar solutions is also part of the group's activities in Germany, as is the chemicals sector with petrochemical products through to special applications for the automotive and aerospace industries. TOTAL employs more than 3,000 people in Germany.

www.TOTAL.de, www.de.TOTAL.com