Fact sheet

Rather with CNG

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CNG fuel

CNG (Compressed Natural Gas), often still labelled as natural gas at German filling stations, is a high performance 130 octane fuel. It is used both in a highly compressed form (known as CNG – Compressed Natural Gas) and in liquid form (known as LNG – Liquefied Natural Gas). CNG is stored at up to 250 bar in specially designed gas pressure tanks which are integrated as a standard fitting in the underside of the vehicle. Due to the different properties of the natural gas storage facilities used, CNG is offered in two quality categories – H ("High", calorific value: 46 – 53 MJ/kg), and L ("Low", 39 – 46 MJ/kg) – with a resulting effect on the potential distance range and the price.

In chemical terms CNG is primarily methane. Depending on its source, this natural gas molecule can come from a fossil fuel source or be created from a 100 percent renewable biofuel source, such as straw. As the chemical structure of natural gas and biomethane is absolutely identical, biomethane can be used as an additive to natural gas in CNG fuels without generating any concerns about technical problems arising with the vehicle.

CNG is 100 percent renewable: straw in the fuel tank

Biomethane from 100 percent straw is an advanced biofuel which impresses with its 90 percent CO_2 savings, the highest efficiency, and its competitive production cost. Further, a CNG vehicle powered by biomethane produced using straw is more environmentally friendly than an electric car powered using the current German electricity mix, which is for the most part based on lignite and anthracite coal. The technology used was developed in-house by VERBIO AG and is unique worldwide. The first production plant has been in operation at Schwedt/Oder since 2014. A second will be on line in 2018.

Only four big bales of straw (two tonnes in total) are needed to produce the annual amount of fuel required to power a medium-sized natural gas passenger vehicle for a year. According to a study published by the German Biofuels Research Center (Deutschen Biomasseforschungszentrum Leipzig – DBFZ), between eight and twelve million tonnes of straw remain unused in Germany every year, meaning that these are available for the generation of biofuels. Using the VERBIO technology this could be used to create enough fuel for five million vehicles.

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CNG is a very high octane fuel

One basic advantage of CNG is its high knock-resistance (octane rating), as this enables higher thermodynamic conversion ratios to be achieved at higher compression levels – the difference being similar to the difference between using a normal petrol engine and a combined super plus fuel engine. With its 130 octane rating the technical combustion properties of CNG make it almost the ideal petrol-based fuel. It results in a smoother combustion in the engine block and the engine is noticeably quieter. This is an important argument for its use in inner-city traffic, for example in natural gas buses and natural gas taxis.

Nitrogen oxide emissions

Nitrogen oxide (NO_X) is a combined term for nitrogen monoxide (NO) and nitrogen dioxide (NO_2). These are generated by burning diesel and petrol. In high concentrations, nitrogen oxides irritate the mucous membrane and result in respiratory diseases. They are responsible for high ozone levels in summer. Thanks to catalytic converters, modern petrol engines now produce very little nitrogen oxide, but even new diesel vehicles still have some catching up to do in this regard. At best, diesel should be as clean as petrol since the introduction of the Euro 6 emissions standard. Euro 6 applies to all new vehicles from September 2015. However, there are early indications that in realistic conditions Euro 6 diesel may sometimes result in levels of nitrogen oxide emissions which are significantly higher than permitted.

In the ADAC-EcoTest (ADAC: Allgemeiner Deutscher Automobil-Club e.V. – General German Automobile Club), 77 vehicle models were tested for consumption, pollutants and CO_2 emissions. Of these, fine particles and nitrogen oxide are considered the most problematic pollutants. Only alternative fuels were awarded the highest five-star rating; these included electric cars, vehicles powered by CNG, and hybrid engines.

Diesel vehicles were given a poor review. Legal limits for nitrogen oxides were sometimes exceeded by significant amounts. Based on these tests, a new vehicle does not automatically come with a guarantee of environmental cleanliness. For example, based on the results of the ADAC tests, some Euro 5 diesel vehicles emit less pollution than more modern Euro 6 models. Natural gas vehicles proved particularly clean in the emissions testing performed as part of the ADAC-EcoTest. The Skoda Octavia G-TEC, for example, generated almost no particles at all.

Almost all vehicles contributing to compliance with environmental emissions limits while at the same time reducing CO_2 emissions were powered by alternative fuel sources (BEV, natural gas vehicles, hydrogen-powered vehicles).
http://www.adac.de/ecotest

Availability of CNG vehicles

There is a wide range of CNG passenger vehicles in serial production, including vehicles produced by VW, Audi, Fiat, Mercedes, Opel, Seat and Skoda. In addition, there are CNG- or LNG-powered commercial goods vehicles in serial production, including buses, waste disposal vehicles, transporters, and light and heavy goods vehicles.
http://www.gibgas.de/fahrzeuge

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Extending tax benefits for CNG fuels until 2026

CNG from natural gas and biomethane were declared one of the three energy sources which can make a decisive contribution to reducing pollution emissions as part of the federal government's environmental policy initiative to support the worldwide reduction of CO_2 emissions. The Second Energy and Electricity Tax Amendment Act, which has not yet been approved by the German parliament, will extend the tax benefits for the use of natural gas and biomethane (CNG/LNG) fuels beyond the year 2018. An extension is planned for a further eight years up until 2026, although it is planned that the amount of tax benefit will be reduced from 2024.

The amendment should take effect from January 1, 2018. Parts of the tax benefits require approval under EU Commission subsidy rules; accordingly, these will first be applied after approval has been received.
www.bundesrat.de
www.bundesfinanzministerium.de

Further information and current news concerning the use of CNG fuels in Germany and in Europe can be found on the following websites:

www.gibgas.de
www.cng-club.de

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