

„CNG trucks“ – a clean and alternative propulsion system for the heavy goods traffic

Shining example with attractive fleet solution

The transport company FRIKUS assumes example status and uses successfully a CNG truck for the MAGNA STEYR factory supply transport in **Graz/Austria**. The short distance test-use shows considerable reductions of the air pollutants (for CO₂ ca. 20 %) as well as a reduction of the fuel consumption (10 %) and the fuel costs (ca. 20 %). Therefore the CNG Econic is not only ecologically favorable driving on natural gas but also economical and therefore in the short distance traffic up to 300 km/day an attractive solution for the fleet business.



Natural gas has many advantages

Natural gas is an odorless and nontoxic fuel, cheaper than diesel and shows very good environmental qualities. Soot particles as well as particulate matters are nearly zero. Due to the fuel saving advantage the competitiveness of the company is strengthened. The noise emissions show a reduction by 50 %, the CO₂ emissions are considerably lowered. If filling biomethane the Econic NGT is operated nearly CO₂ neutral. This fact is especially strong for the factory of MAGNA STEYR automotive engineering and the associated production logistics. Today the 42 mostly EURO 3 trucks applied in the factory supply transport show considerable effects in their daily use - with approximately 5.900 km/day in total - to the surrounding of the plant because of pollutant emissions and noise. 37 trucks do not drive more than 350 km per day. A sustainable reduction of CO₂, NO₂ as well as soot particles for the improvement of the local air quality facilitate the achievement of the industries specifications and helps securing the production site on the long term. In Austria natural gas can be filled at more than 160 filling stations. With a tank capacity of 100 kg (ca. 650 liter volume) the natural gas truck manages a distance of approximately 350 km.

As an LNG construction (liquefied natural, tank capacity 230 kg or 330 liter) the vehicle scores with ca. 800 km operating distance.

Mercedes Econic NGT

The Econic with natural gas engine satisfies the tight exhaust emission standard EEV (Environmentally Friendly Vehicle) and falls below the EURO 5 emission standard. EURO 6 can nearly be reached even today. Free drive in environmental protection zones is therefore secured. Since 2003 the Mercedes Econic NGT EEV is produced. Every year nearly 1.500 Econic (thereof 400 NGT) leave the Wörther plant, which are demanded mainly by cities.

Financial support for changing vehicles

Environmental legislation as a driving fact for new technologies is important. Within the actual economy phase however adapted framework conditions and a compensation of the higher investment costs of 25.000 Euros at the moment are for a changeover essential. Financial support for a fleet change to natural gas or the construction of filling stations are available in the frame of the klima:aktiv mobile program of the Austrian Ministry.

Leading project as starting point for fleet use

With the innovative use of natural gas heavy duty vehicles deals the A3 Plus project „Clean Heavy Duty“ under direction of Prof. Dr. Ernst Pucher, Technical University Vienna. Real World exhaust measurements were performed directly in the vehicle so that the ecologic efficiency as well as the technological optimization could be proved. MAGNA STEYR has developed a high pressure fuel tank system with carbon fibers to reduce the vehicle weight and the fuel consumption due to the light weight construction. In the future important components of the natural gas technology come from Graz. The project will be presented at the international GasHighWay seminar on 28th of January 2010 in Malmö, Sweden organized by NGVA Europe.



Information and contact details of the Clean Heavy Duty project partners: www.grazer-ea.at
Information regarding the international GasHighWay seminar: <http://www.ngvaeurope.eu/a-trans-european-road-to-renewable-mobility>



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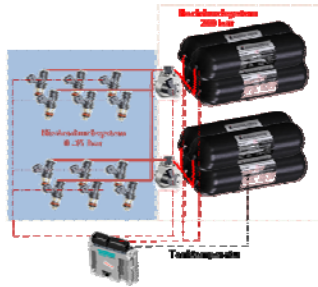
Mercedes-Benz

Pappas Gruppe

Natural Gas storage and management

The fuel management and storage system FIPS (Full Integrated High Pressure Storage system) consists of the type IV pressure vessels, 2nd generation valves and the electronically pressure regulation system. All pressure components are integrated, the interface to the vehicle is realized by a low pressure (20 bar) line. The electronically fuel management with 2 units assures high control quality at idle which minimizes emission and fuel consumption as well as full performance up to 220 kW (300 hp).

Fuel pressure can be exploited down to 5 bars – compared with originally – 15 bar which indirectly increases the cruising range of the truck. An integrated sensor technology allows to



calculate permanently the stored (kg methane) energy by compensating the ambient temperature. The type IV pressure vessels are wound with a new multi-axis industrial robot which is able to produce in a very small bandwidth of material thickness and high quality. This process ends up with burst-pressure-tolerances below 2 percent, minimized costs and results in a weight reduction of up to 500 kg for the complete truck. Further reduction can be realized

by a new frame concept – especially adapted for alternative propulsion -



which is part of the eco-truck[®] research program by MAGNA Powertrain.