

## A trip to GNV Madrid with a CNG Zafira Turbo demonstrates that a NGV is Europe wide useable

Almost 5,400 km have been driven from the Opel factory in Rüsselsheim down to the GNV exhibition & conferences, held in Madrid during June 17-19, and back with the goal to test and demonstrate the capability, cost efficiency and environment friendly traveling solution by a state of art CNG vehicle. Special thanks to the Opel public relation office for providing a car of their test vehicle fleet and also NGVA Europe for their very helpful support throughout the trip. The trip was planed from Germany through Switzerland



and the over France to Spain. The route back went through France, Italy, and Switzerland. Making a route plan through **Germany** with it's over 800 filling stations or in **Italy** where there are approximately 700 stations is quite an easy task. But in Italy the opening hours for NG filling stations do matter, since in Italy the gas is mostly served by station personnel, who have fixed working hours. The situation is also very comfortable in **Switzerland** with over 100 refuelling possibilities. But this was a completely different story in France and in Spain.

*From left to right: Enrique Garcia-Poggio (NGV Director, Gas Natural), Matthias Maedge (Marketing & Communications Manager, NGVA Europe) and Henrik Domanovszky*

In **France** I could only find 28 registered filling station directions, although in 2000 an agreement has been signed that in the following five years 500 stations should have been built. Many cities in France already introduced CNG bus fleets, whereas private cars only exist detached. The problem was that 26 of the filling stations were only useable with a local refueling card of GNVert (has to be obtained previously via calling a service number: + 33 (0)1 49 14 79 80). Due to the fact that credit cards are not generally allowed and the missing infrastructure of filling stations makes it hard for travelers to get access to CNG in France. This is really is a pity and is not really convincing potential user to buy a NGV.

Even though there are 42 filling stations in **Spain** existing, only 2 of which are public. Paying was not a problem at all, but at these two public locations the traveler is facing another problem; not all of the navigation systems can find the quite hidden and not well signposted locations in Valencia and Abrera (near Barcelona). However, **the CNG turbo Zafira solved the distances between Montpellier-Barcelona-Valencia-Madrid without using the emergency petrol tank!**

The new Zafira can be filled with about 20 kg of methane and an additional 14 liters of petrol. Thus, the theoretic range is 540 km, calculated on an average consumption, but according to the best measured consumption from Barcelona to Valencia on the motorway, **the total range was 666 km, 467 km on gas +**

# Journey Report by H. Domanovszky 30<sup>th</sup> June 2009



**199 km petrol.** In this leg of the trip the average speed was 95 km/h and the top speed 124 km/h. Out of 5.397 km total distance, 4.707 km have been driven on methane fuel. The overall average fuel consumption **of 5,27 kg on 100 km** shows the advantage of NG/biomethane as a vehicle fuel. This figure matches exactly with the MVEG-cycle, equal to 144 g/km CO<sub>2</sub>. **The best fuel consumption achieved even resulted in 117,5 g CO<sub>2</sub> tailpipe emission only.** That is an excellent result made by a car which has not less than 1.735 kg empty weight (corresponds with 16,8 g per seat for each km). During the whole trip not less than **269 kg of total CO<sub>2</sub> emission were saved, compared to the petrol version of the CNG Zafira.**

The new 1.6 liter turbo engine guarantees full pleasure of driving. The family van with its 150 horsepower and 210 Nm has as much power as the 2.2 liter direct injected petrol version, and the top speed level with 200 km/h is also the same. In practice the top speed was even slightly higher than that and I still had the feeling that there was still power left. But the spectacular thing is the CO<sub>2</sub> emission performance of the CNG Zafira, when looking at 197 g/km emitted by the 2.2 DIRECT Zafira, **the CNG turbo powered version produces 37% less of CO<sub>2</sub>.**

The trip to Madrid has been demonstrating also in terms of the unbeatable cost efficiency of the CNG fuel price. Thank to the low consumption and the pricing of the compressed gas, **the total fuel cost was 214 €, (127 € less compared with the same energy content that would have been needed by the petrol version), which means 37 % cost savings. In the public stations near Barcelona (Abrera) I could even buy natural gas for the unbeatable price of 0,61€ per kilo, resulting in only 2,66 cent fuel cost per km – and this by a 7-seater!**

There was access to NG/biomethane all alongside the road, even in Madrid where the Opel Zafira was offered gratis methane by the major national gas supplier and NGVA Europe Board member, Gas Natural. Gas Natural gave access to the local fleet filling station of the Madrid transport company EMT that operates with Europe's biggest garbage collection truck fleet running on methane. Their trucks and also more than 400 of the city buses in Madrid are running on biomethane. At this point, the science fiction movie "Back to the Future" – from the middle of the eighties – turned into reality, as the Zafira CNG got its fuel produced from landfill garbage. **In Valdemingomez, Madrid, there is the world's largest urban waste biomethane plant, which uses raw biogas coming from a 1 million qm<sup>2</sup> sized landfill site.** The raw biogas is purified during a 21 days long fermentation and cleaning process before it becomes a worthy biomethane gas. Once purified the CO<sub>2</sub> neutral methane is ready to fuel vehicles, or can also be fed into the gas grid.

In this manner a NG/biomethane powered car is lowering CO<sub>2</sub> emission significantly and has a tremendous negative balance on the global warming effect.

Reported by

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