

BLUE FUEL

Gazprom Export Global Newsletter

2019/ Issue 52

Special Focus: Blue Corridor Rally

Hit the Road, Gas!
Report from the Big Ride page 8

Uniper: Glance from Germany page 34



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To Our Readers



“Why do people drive from Shanghai to St. Petersburg on a natural gas vehicle? Because they can”. This is how German journalist Axel F. Busse recently wrote¹ about the Blue Corridor Rally 2018, when NGVs traveled 10,000 km from China to Russia via Kazakhstan. This year Blue Corridor returned to its birthplace – Europe.

CNG and LNG vehicles covered over 5,000 km through the continent. In ten cities experts and politicians gathered at round tables and conferences to discuss the importance of developing CNG and LNG. As Axel F. Busse emphasized, the Rally itself was the best promotion for methane. NGVs successfully rode thousands of kilometers, proving cost-effectiveness and environmental advantages of gas.

Today, many countries across the world are striving to reduce carbon dioxide emissions. However, this topic has long gone beyond the professional community and has become even vulgarized.

Today, global warming and climate change are a hackneyed subject of debates in governments and parliaments as well as at table talks in each family.

Consequently, the general expert level of the environmental discussion has dropped. Talking about climate changes, many people and, unfortunately, even some politicians just use clichés without considering a problem. Common opinion is that renewable energy is the only way to reduce emissions. Renewable power sources as the elixir for «saving the planet» has entered public discourse with such vigor that for some people even the thought of using hydrocarbons is a kind of sin. This is what Ludwig Möhring, the head of German Federal Association of Natural Gas, Crude Oil and Geothermal Energy, has recently called a «knee-jerk policy on the basis of «renewable is good, fossil is bad”». He mentioned the latest decision of European Investment Bank

to end lending to fossil fuel projects, including natural gas.

This way of thinking motivates us, representatives of the industry, to promote natural gas even more. We should advocate gas as a clean fuel with the simplest and the most convincing examples. Transport is a great example. While only experts comprehend full details of heating technologies or gas supplies, almost everybody love cars. NGVs are the best example of how gas can improve our life right now, be attractive and affordable.

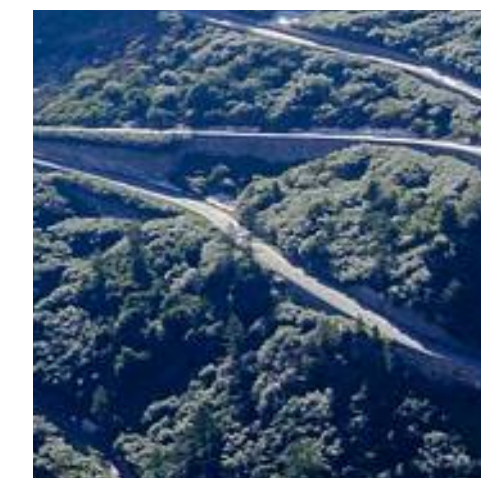


For this very reason, many top companies of the industry joined the Rally this year. Among them are Gazprom, Uniper, OMV, Snam, Comita, INA, NIS, TurkStream, Nord Stream, Borsig ZM Compression, NGVA Europe, Zukunft Erdgas etc. In this issue, you find comments and articles from many of them.

The well-illustrated article of Eugeniy Pronin, the founding father of the Rally, is a special one. Among other things, he talks about electric mobility, which actually turns to be less clean and safe than natural gas

transportation, especially when conventional electricity is produced by burning coal. However, it enjoys

various administrative and financial privileges by European governments. That is exactly why we call for an expert opinion free of prejudices. Enjoy our special edition.



¹ <https://www.auto-medienportal.net/artikel/detail/50066>

History of the Rally

The Blue Corridor is a rally of vehicles powered by natural gas (NGVs). It is a joint project of Gazprom and Uniper.

The idea of the Blue Corridor Rally was conceived in 1999 by the non-governmental Vernadsky Ecological Foundation (Moscow). The very first Rally was held in 2008, the drivers travelled from St. Petersburg to Moscow. Since then, 12 rallies followed more. Altogether, over 200 originally-equipped NGVs took part in the project and drove over 60,000 km, passing over 130 cities in countries of Europe and Asia.

The Rally is not only about driving the road. Along the route, it is always accompanied by media events, round tables and exhibitions of NGVs. Participating experts, politicians, car manufacturers and transport companies have a chance to exchange their views on gas mobility, while media and public can learn more about this fuelling technology.

Each rally has its own focus. In 2013, it was the Hansa Tour aiming at different applications of liquefied natural gas (LNG) in the Baltic Region. In 2017, the focus was on heavy-duty trucks. In 2018, for the first time the rally expanded to Asia, crossing 10,000 km from Rudong to St. Petersburg via Kazakhstan.

This year's Blue Corridor returned to its birthplace - Europe. The 13th Rally included two stages. From August 29 to September 20, the NGV caravan drove 5,200 km from Istanbul, Turkey, up to Greifswald in Germany through 12 countries of Europe. The route symbolically connected exit points of TurkStream and Nord Stream 2 gas pipelines, which will be put into operation soon. Within the European leg of the Rally, round tables, media events and exhibitions of NGVs took place in ten cities: Istanbul, Belgrade, Zagreb, Ljubljana, Milan, Brussels, Vienna, Meerane (Zwickau), Berlin, and Lubmin (Greifswald).



ceremonial finish at St Petersburg International Gas Forum on October 3, where a special session was dedicated to use of gas in transport.

At the very beginning of the Blue Corridor initiative on the 2000s, the aim of the project was to examine the feasibility and demonstrate the necessity of establishing transport corridors for NGVs. Gas on transport is a widespread technology, but it still has a great potential for expansion. Nowadays, the whole gas fleet in Europe exceeds 2,000,000 vehicles, there are more than 3,700 CNG filling stations and more than 200 LNG ones. In 2019, at each gas station along the route of the Rally we met a queue of drivers waiting to fill their cars. It means that the gas filling network is working of full, and must be further expanded.

However, as time pass, the public discourse has changed and now it is the ecological advantages of methane that draws particular interest. As more and more people think about reducing carbon dioxide emissions, the attention is paid to the natural gas. Using gas in vehicles, CO₂ emissions are reduced from 16% and 23% compared to diesel and petrol. The emissions of NOx are 70% lower and particulate matters emissions are 95% lower than from diesel.

Another advantage of gas is affordability, as gas fuel is cheaper than oil and diesel. Gas also has a long distance of run, more than 450 km for CNG and up to 1,600 km for LNG. Besides that, methane is famous for its safety. On modern NGVs, tanks are tested for a pressure of 600 bar, even though they are normally exposed to only 200 bar.

The Rally itself – its organizers, guests and participants – can provide a much deeper insight in the question. In this issue, you can find their comments.



BLUE CORRIDOR:

Hit the Road, Gas!

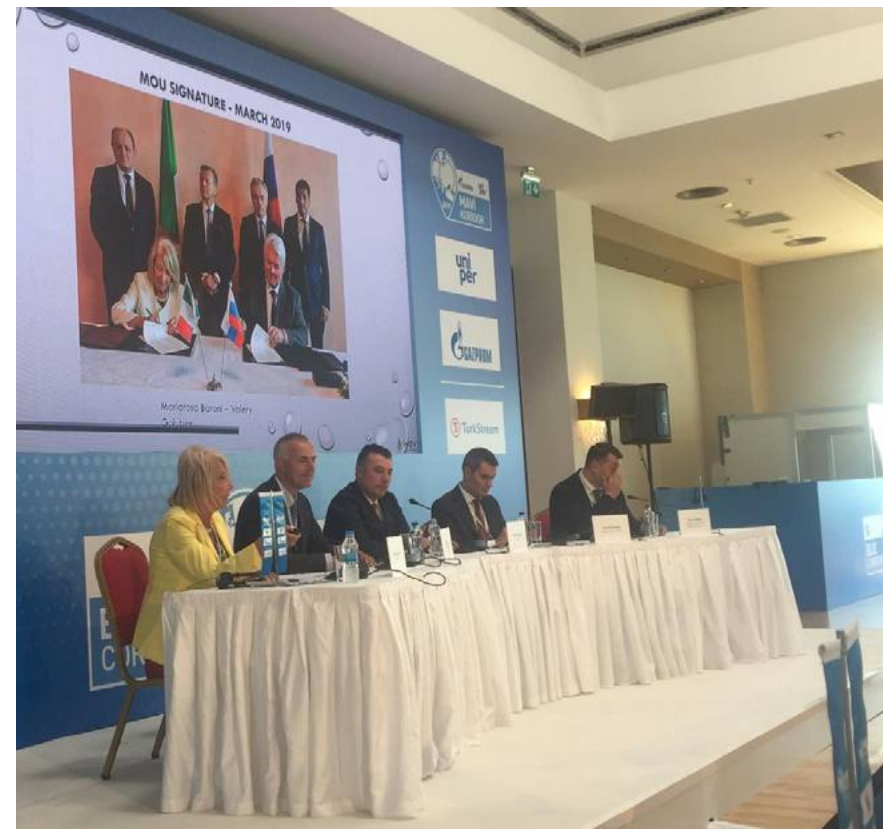
In August 2019, Blue Corridor team for the 13th time started their annual rally. The experienced crew drove top-notch natural gas vehicles across Turkey and 12 European countries. Istanbul was symbolically chosen as the venue for the Rally's start, as the TurkStream brand-new gas pipeline comes ashore near this city. Then the route led the drivers to Greifswald, where the Nord Stream 2 pipeline meets the German coast. In 2019, the Rally returned to Europe after having crossed 10,000 km from China's Rudong to Russia's Saint Petersburg in 2018.

TURKEY

It was the first time ever that Blue Corridor Rally started in Istanbul, Turkey. The symbolical spot was chosen in anticipation of the upcoming launch of the TurkStream gas pipeline. It was boiling-hot, as usual for a Turkish August but the participants were ready and heading to the starting point where they were going to take part in a ceremonial kick-off. Eugene Pronin, Andre Schumann and Vladimir Tatarin have been participating in the Rally for many years. This year they decided to hit the road again. With ambitious plans to cross the whole continent, the crew arrived to the Bosphorus shore, from where Europe begins.

Mavi Koridor, they say. “Blue Corridor” in Turkish. Though unofficial, this name became very popular among the participants who were eager to learn new expressions in every country they visited.

Along the Route, Blue Corridor organizes various roundtables and discussions concerning natural gas fuel use, its advantages and obstacles for its development.



At the first discussion panel, participants and visitors had a chance to exchange views on the advantages of gas as fuel for transport in terms of technology and ecology.



NGV Rally “Blue Corridor” – Back in Europe



Eugene Pronin, Founding Father of the Rally

After an epic CH₄ marathon to China last year, in 2019 the 13th edition of the Blue Corridor NGV Rally Blue Corridor got back to its birthplace - Europe. This traditional event originated by Gazprom of Russia and co-organized by Uniper of Germany has a primary goal of promoting natural gas as the best environmental and economic alternative to oil-based fuels for global transportation industry.

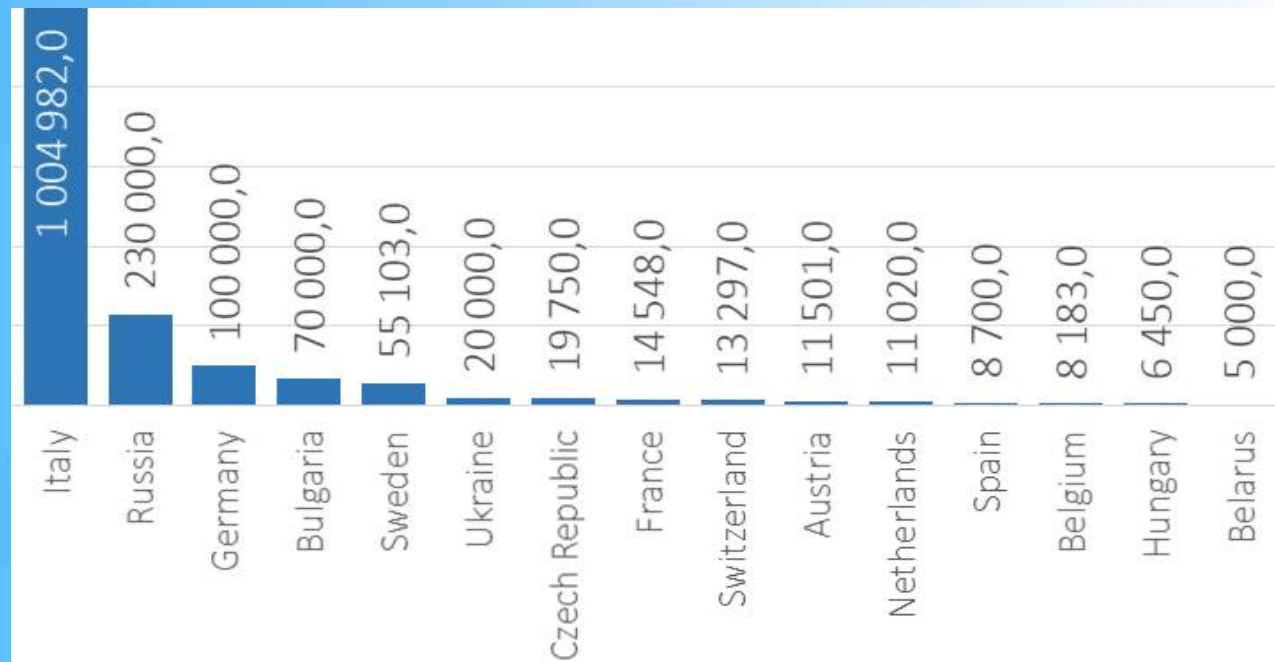
In 2019, the Blue Corridor has driven a long way of 12,500 km across 21 European nations. Taken altogether, over 100 light, medium and heavy duty CNG and LNG vehicles from major European automakers have participated in the Rally.

Business program of the event gathered almost 1000 experts from business and politics at the round tables and conferences in Istanbul, Belgrade, Zagreb, Milan, Brussels, Vienna, Meerane (Zwickau), Berlin, Lubmin (Greifswald), Moscow and Saint-Petersburg.

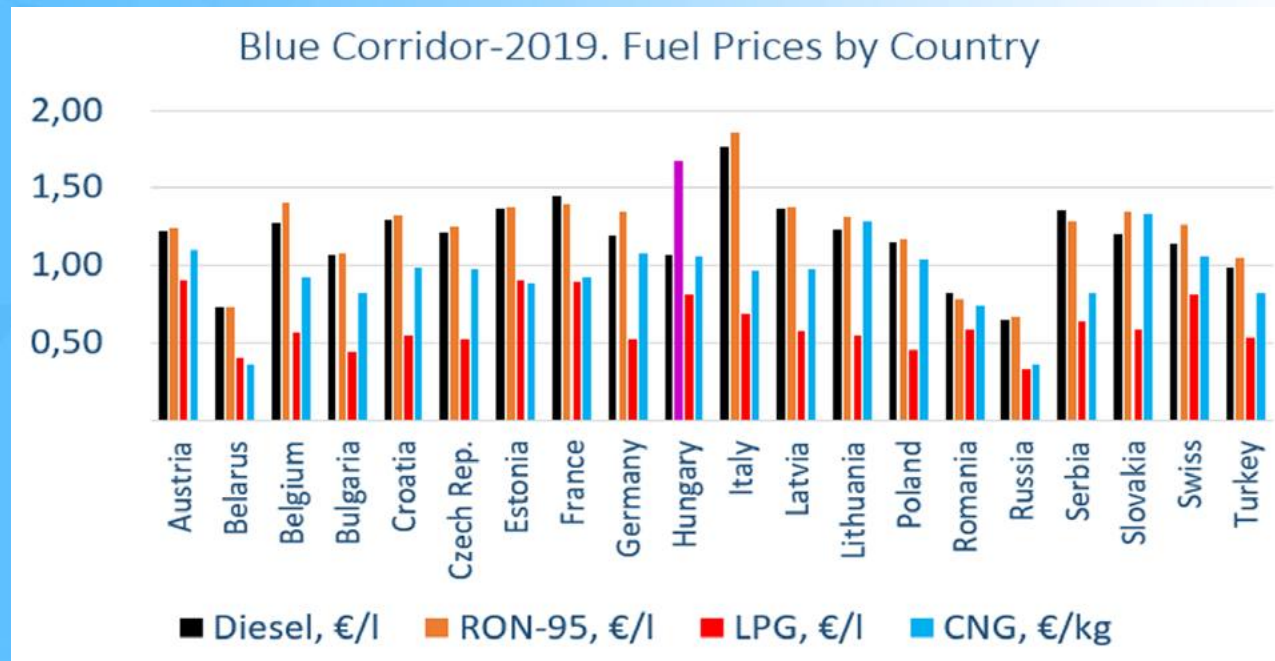
The caravan of methane-breathing vehicles visited European leading NGV countries (Italy, Russia, Germany) with established NGV markets and very welcome newcomers (Hungary, Romania).

As of the end of 2018, the global population of NGVs accounted for some 30 million vehicles and 30,000 stations. Over 2 mln NGVs are estimated to drive in Europe. Italy is No. 1 country in Europe. There are over 1,000,000 vehicles and over 1,000 CNG and LNG filling stations. In Russia some 230,000 vehicles get filled at approximately 360 stations. Methane filling network in Germany is also well developed. Like in Italy, they have about 1,000 filling stations, but the population of CNG and LNG vehicles has a lot of room to grow. About 100,000 NGVs are attributed to Germany.

Number of NGVs in Europe

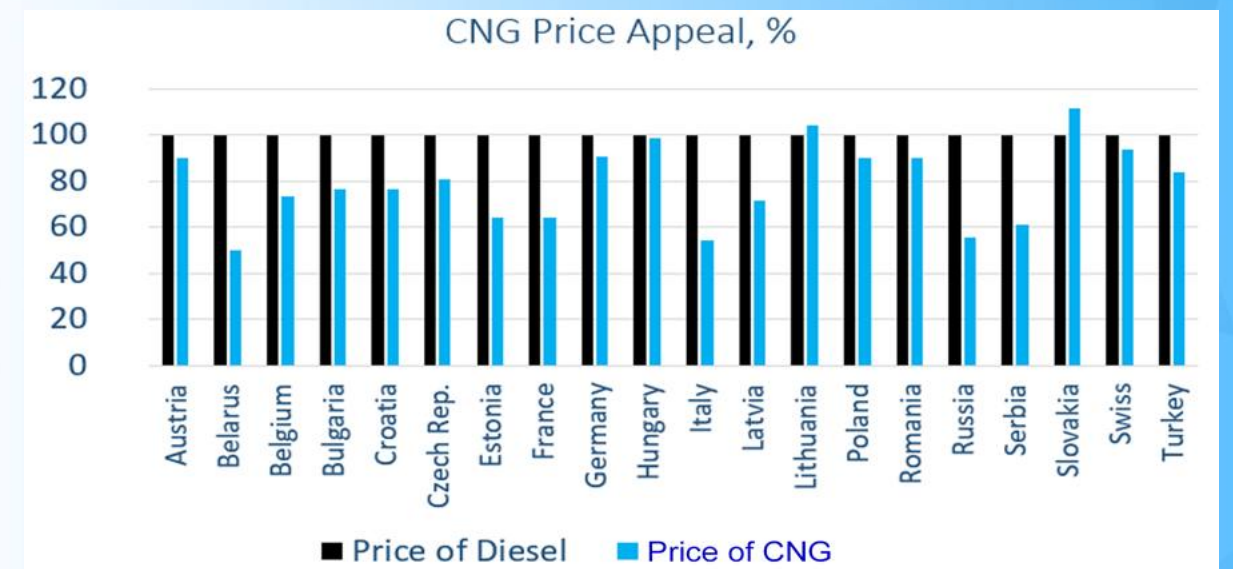


Source: NGVA Europe, NGV Global, IGU, UN ECE, NGV Italy



Source: Blue Fuel - 2019

Retail fuel prices at the totems of filling stations differ from country to country. Also note, that in Belarus, Lithuania, Poland, Russia, and Turkey natural gas is priced in cubic meters, and therefore, the volumes had to be converted into kg. In some countries of the “Blue Corridor-2019” price differential between natural



Source: Blue Fuel - 2019

gas and other fossil fuels look appealing enough for transportation companies. On the other side, there are countries, where substituting oil fuels for natural gas makes no direct economic sense. However, in terms of emissions there is no better commercially available alternative other than CNG and LNG.

During the recent natural gas marathon best price differential was recorded in Belarus (50% of diesel price), Italy (54%) and Russia (55%). Moneywise natural gas is less attractive in Slovakia (no saving at all), Lithuania (only 2% cheaper compared to gasoline), and Romania (5% cheaper).

It has to be noted again, that fuel prices quoted above do not represent average numbers, but specific values at specific stations and could be different from fuel prices at other locations.

More on p. 31

Denis Kornienko of Gazprom Gas-Engine Fuel (GGMT) LLC joined the Rally team in Istanbul to speak about legislative support of NGV infrastructure in Russia. As his company operates the vast majority of the 400 gas-fueling stations, he pointed out some special GGMT’s efforts to promote the use of natural gas on transport.

Kornienko’s speech attracted much attention of the other participants of the roundtable. The panel gathered the most experienced natural gas market players both from Turkey and Europe. Yaşar Arslan, the head of the Turkish Natural Gas Distributors Association, and the President of NGV Italia Mariarosa Baroni were among them.



Baroni was the one who brought Italy's *prima* experience in the area of NGV to Istanbul:

“What we promote as the Association is the new climate policy to push the clean vehicles,” Mariarosa Baroni said

She told the participants more about how Italy performs CNG and LNG fueling stations' network development, significant at European scale. Baroni also recalled the ceremonial signature of the Memorandum of Understanding between the Russian and the Italian NGV Associations that took place earlier in 2019.

Then, the awaited ceremonial kick-off took place and the vehicles started their 5,000-km route to further promote CNG and LNG across the whole European continent.

SERBIA



Belgrade welcomed the participants warmly: unexpected heat hit the city, and after driving two days from Istanbul the crew escaped the extreme weather conditions in cool discussion rooms. Busy schedule included pretty intensive but vivid roundtables. Representatives of natural gas suppliers, motor fuel retailers, car manufacturers, transport companies, and media gathered at NIS a.d. Novi Sad headquarters to discuss the present and the future of Serbian gas motor fuel market.

Marco Hodalič from the IVECO office underlined that LNG-powered heavy-duty vehicles emitted nearly 50% less noise than diesel ones, which is extremely important for public health in cities.

Chicken-and-egg problem is a very common definition among professionals in the sphere of NGV. It describes the dilemma about what should come first: filling stations or NGV fleet itself. The participants discussed this conundrum and analyzed how high prices on NGVs influenced the development of CNG and LNG stations.

Today, there are around 20 CNG fuel stations and approximately 1,000 CNG cars in Serbia. Alongside the obvious environmental benefits, CNG in Serbia is more than 40% cheaper than diesel. The price difference is also driven by tax benefits. The participants of the meeting agree that the current tax treatment is important for successful development of the NGV market.



Source: Gazprom Export



Volkswagen Passat

Engine: 1.4 TSI.
Volume of gas on-board: 22 kg.
Range on CNG: 500 km.
CNG Consumption per 100 km: 4.6 kg



CROATIA

Next stop for the Blue Corridor crew was Croatia, a well-developing market for natural gas vehicles! Since May, 2013, when the first CNG-filling station was opened, public transport on natural gas has been rapidly developing on the streets of Croatia's cities.

The discussions in Zagreb took place in the INA building under support of the Croatian Gas Expert Association. Among the professionals speaking at the roundtable was Alexey Gnatyuk from Gazprom Export. In his presentation, he touched upon the prospects of natural gas supply in Europe. In this context, he mentioned Gazprom Export's Electronic Sales Platform – a new tool enhancing the flexibility of gas supplies. Mr. Gnatyuk pointed out that gas consumption in Croatia is likely to remain stable and market competitiveness here will increase.



SLOVENIA

Živijo from Ljubljana! Did you know that Slovenia has one of the highest car ownership per capita rates in the world? The Slovenian government is active in expanding the use of NGVs and calls for the construction of infrastructure for alternative fuels. The first CNG station was opened in Ljubljana in 2011. It is projected that a third of all buses in Slovenia will soon be fueled by natural gas!

Hotel Slon hosts another roundtable in Slovenia. President of Comita Group Companies Danilo Duraković and Head of Directorate for Sustainable Mobility and Transport of the Ministry of Infrastructure Milena Černilogar Radež welcomed the participants and discussed.

Blue Corridor 2019 – Welcome to Slovenia!

On September 4, 2019, Congress Square in Ljubljana welcomed the Blue Corridor Rally consisting of a fleet of natural gas vehicles (NGVs). After a short introduction, the drivers and other guests took part in a roundtable discussion regarding the role of natural gas as vehicle fuel. Comita, the local partner of the event and organiser in Slovenia, continues to be a part of the project, and has sent its own NGV and support crew to drive the entire stretch of Blue Corridor 2019. The Ljubljana event was also attended by representatives of the Ministry of Infrastructure of the Republic of Slovenia, and representatives of the power supplier Energetika Ljubljana, the public transportation provider LPP, the utility provider JP Voka Snaga, the Economic Interest Grouping for Natural Gas Distribution, and representatives of companies such as Petrol, Domplan, Scania, and Iveco, to name just a few.



Urban Ocvirk, Head of marketing at Comita d. d.

In many respects, 2019 was a watershed year for the European gas industry. Designed to supply Europe with new gas reserves, the new Nord Stream 2 and

TurkStream gas pipelines are approaching completion. The well-developed natural gas infrastructure in Europe and the European gas market will allow customers in many countries to reap the benefits of these pipelines. This year's project was an opportunity for the organisers and project partners to address the new opportunities opening up for the NGV sector, and symbolically connect the start and end of the new pipelines to demonstrate the availability of gas supplies, and illustrate how much the gas infrastructure in Europe has evolved.

In terms of using natural gas as vehicle fuel, the overall situation is improving. Around the world, the number of vehicles running on NG is on the rise. Thirty-five years ago, there were approximately 800,000 NGVs in operation, compared to 13 million NGVs today, with the number of filling stations standing at 30,000. In Europe, NGVs are most common in Italy, with around a million vehicles in operation. In Slovenia, there are 470 NGVs, mostly buses and trucks. It makes sense then that the number of filling stations is on the up as well. In Slovenia there are currently two in Ljubljana, with one each in Jesenice, Maribor and Celje, and new ones underway (Kranj). It seems that consumers in Slovenia, too, are gradually warming up to the advantages of natural gas.

The takeaway from Blue Corridor 2019 and the roundtables was that the focus of the questions raised by participants shifted from the (seemingly never-ending) "egg or chicken" question to seeking out concrete, comprehensive solutions for the integration of NGVs into traffic, both at the level of national and local authorities as well as in partnership with providers and NG producers. The need for coordinated action was also made clear at the Ljubljana roundtable which, to be fair, was not that much different from other such events in smaller countries in which regional participants mostly bring up questions associated with the current legislation (or rather the lack thereof, with regard to, for instance, regulations regarding the construction of NG filling stations), the relevant tax policies, local incentives and siting, which are typically bound to the wider European regulation and decarbonisation guidelines. Slovenia is no exception.



The major global players in Italy, Belgium, Austria and primarily Germany already face energy dilemmas and challenges at the European and EU levels, which, up to a few years ago, were but a mere whisper at informal tables. It is becoming increasingly clear that the idea of electric mobility does not have only supporters; indeed, there also sceptical voices (realists?) popping up, people who are aware that the car craze comes on the back of the progress in emerging markets and developing countries. Can such a dynamic truly be powered (solely) by e-mobility? Can the power grid in Slovenia and Europe handle the influx of new consumers? Is the market ready for increased electricity consumption? Although we can all agree that green electricity powers green electric mobility, big market

players are increasingly vocal about the reality and economic viability of such plans. The path toward a low-carbon economy thus remains long and fraught with obstacles, requiring, so it would seem, mainly a diversification of motor fuels, on top of the transition to "new oil", i.e. electricity from renewable resources. This is especially problematic in Slovenia, which is still dealing with the environmental consequences of the recently built thermal power plant on more than one level.

At the same time, it should be pointed out that methane, much like electricity, is not the be-all and end-all which was clearly pointed out in the course of Blue Corridor 2019. As a matter of fact, methane is only one of the solutions on the path toward a clean environment, and it should come in addition to other motor fuels, i.e. electricity, petrol and diesel, and, in the long run, also hydrogen, taking into account the specific requirements such as distance, types of vehicles, logistical needs, etc. And yet it seems that NGV advocates are more on board with this idea than the motor fuel competitors.

This issue was also brought up by the representative of the Interest Grouping for Natural Gas Distribution at the roundtable in Ljubljana. According to the speaker, the lower price of NG compared to petroleum products is one of NG's advantages, followed by its environmental aspect, and the fact that CNG as a motor fuel can come with a high percentage of biogas, which is another way to increase the share of renewable energy. At the same time, the grouping believes

that Slovenia should provide subsidies for NGVs in the same vein as it does for electric vehicles, on the grounds that NGVs, much like electric vehicles, are also more expensive than petrol- or diesel-fuelled vehicles. As of right now, the Republic of Slovenia only subsidises vehicles operating in urban traffic and public works vehicles in municipalities that have adopted the Air Quality Decree imposed by the European legislation. It will take more than just an immediate switch to renewable resources to meet the ambitiously set climate targets without increasing the use of NG.

The scepticism about electric vehicle state subsidies was also addressed by the spokesperson of the energy provider Energetika Ljubljana who said that the promotion of electric vehicles is unwarranted, as the production of electricity causes more emissions than NGVs. In his words, there is no hope for the world as long as people make purchases based on subsidies. Raising the awareness about the benefits of using NG to fuel motor vehicles is therefore key to lower emissions, and should pave the way to a carbon-free society.

Five thousand kilometres from where it started, it now seems that the rally did an important job: readdressing some important issues, calling attention to an overly simplistic or even hypocritical transportation policy, but most of all, it shone a spotlight on NGVs in front of the public. In most cases, it is the fear of gas

that is holding back the implementation of this technology in transportation, so it's especially important to create positive user experiences. Another issue is the relatively small range of serially produced NGVs, and the inadequate filling infrastructure (for instance in Croatia). There is no doubt that there is room for improvement in Slovenia, and I am sure that we, the members of this small Slovenian gas family, can succeed by working in close partnership. Let us work toward a shared European and global target of reducing harmful emissions by employing the right energy mix, both in energy and in transportation. Let us hit the road at full speed with a level head and an open mind!



ITALY

Ciao, ragazzi! The Blue Corridor crew arrived in San Donato Milanese. Milan, the capital of Lombardia Region had always been a special milestone for the Rally because it was here where Blue Corridor got huge support in 2008, when the Rally went beyond Russia for the first time. Milan is located at the crossroads of many European transport corridors. Italy's huge CNG-fleet (more than 1,200,000 NGVs) and the well-developed CNG-filling infrastructure serve an unprecedented example for Italy's neighbors.

Two years ago, in 2017, the Blue Corridor Iberia-Baltia Rally was hosted in Milan by the government of Lombardia. Warm memories for the Rally crew! This time in Milan, the Rally participants are kindly welcomed by Snam company. At Snam headquarters, the Blue

Corridor crew participated in a ceremonial opening of a corporate CNG cuboGas station.

During the roundtables in Milan, Head of NGV Italia Mariarosa Baroni joined the crew again. She spoke about her Association that promoted NGV all across Europe. Ms Baroni added that she expected Germany to be the next European CNG flagship since it had a lot of opportunities to implement Italy's experience.

Gabrielle Barucco from the government of Lombardia

told the participants that an amendment to the regional budget in support of NGV infrastructure proposed by him had been successfully adopted in 2018.



BELGIUM



NGVs in Belgium and the number continues to grow.

The first in Heverlee

The Rally crew visited the first CNG and LNG station along a Belgian motorway. At the Esso Europe service station along the E40 in Heverlee, drivers can now tank LNG and CNG vehicles as well as deliver the CNG to off-grid CNG stations.

Managing Director of Drive Systems Philippe Desrumaux says that the European Commission supported and co-funded the construction of this innovative station through the European Commission's Connecting Europe Facility program. With this investment, the Commission wants to support the roll-out of alternative fuel infrastructure along the major European transport axes and convince more users to switch to sustainable fuels.

The Blue Corridor reception held in Autoworld in the heart of Europe gathered over a hundred of key stakeholders on the NGV market. The participants highlighted the key advantages of using gas on transport and outlined the current state and prospects of the industry.



In Brussels, Blue Corridor had a very special goal: to discuss the state of affairs on the NGV market of not only Belgium but also the one of the EU and to convince European bodies to continue supporting transport on natural gas. Belgium already has a network of more than 120 CNG- and 10 LNG-stations. There are around 15,000

AUSTRIA

On September 12, the caravan stopped in Vienna. On this sunny and breezy day, participants and guests of the Rally gathered at the OMV-headquarters in the modern and green urban district of Krieau. The NGVs parked in front of the OMV-skyscraper, mirroring themselves in its huge glass windows.

The round table was conducted in the hall on the ground floor. One of the wall was glassy overlooking courtyard with a pond surrounded by conifers. The sun provided

Engine: 2.0 TFSI / CNG
CNG Consumption per 100 km: 5,4 m³ (4 kg)
Volume of gas on-board: 23,4 m³ (17,3 kg)
Range on CNG: 390 km
Top speed 224 km/h



A5 Sportback G-tron



plenty of warm light. It felt like the guests and participants of the roundtable were sitting in the garden.

Not by chance, in such in-nature and simultaneously ultramodern atmosphere, developing of gas – one of the environmental friendliest and the most up-dated motor fuel – was being discussed. Among speakers, there were representatives of OMV, Uniper, Shell, Volkswagen Group, as well as public transport operators from Vienna, Augsburg and Salzburg. Almost all of them highlighted that gas is a widespread and effective technology of filling.

“We should not wait for the future, it is already here,” said Franz Weitenberger, Head of Marketing and Communication of MAN Truck&Bus Vertrieb Österreich, regarding use of gas in passenger transportation. “We want evolution instead of revolution,” claimed Michael Sattler, Head of Future Energy at OMV, talking about advantages of gas as transitional fuel.

OMV was not only a generous host of the roundtable, but also an important partner along the route. Wolfgang Kauer of OMV took part in the Rally with an Audi A5 g-tron and drove 3,655 km with CNG in his tank.

3,655 km with Compressed Natural Gas



Wolfgang Kauer from OMV

The Blue Corridor Rally is an event for gas-powered vehicles organized once a year by Gazprom Export and Uniper. Trucks, buses and passenger cars started the rally on August 29 in Istanbul with their environmentally friendly drive taking them through Bulgaria, Serbia, Croatia, Slovenia, Italy, Belgium, Austria and Germany. A demonstration of the environmental, economic and technological superiority of gas over traditional fuels.

Wolfgang Kauer has been at OMV since February 2018. Before this, he was a freelancer in the field of security and personal protection – an exciting and eventful job that also involved a considerable amount of travel. This meant that,

rather than unknown territory, taking part in the Blue Corridor Rally was a matter of course for him. Wolfgang's first impression of the OMV Audi A5 g-tron, which has already been driving on gas for two years:

“

Fantastic, no difference to conventional vehicles. Exceptional electronic controls, filling up was no problem at all. It is extremely cost-efficient and a great car to drive

A journey like this calls for good preparation. “An array of documents for all of the border crossings for the car as well as for the driver; possible highway toll fees for every country, petty cash, provisions and water. As the Audi has a bivalent motor (with CNG and gasoline), a spare fuel canister is also recommended for emergencies. Of course, I researched the CNG filling station network in advance”, says Wolfgang.

“Arriving in the city that never sleeps, my OMV colleagues in Istanbul has prepared a really warm reception. They were really impressed – not so much by me [Wolfgang laughs], more by the car. In Turkey itself there are only ten CNG filling stations. So, it's no surprise that you hardly see any of these cars.

The Audi looks incredibly chic and our colleagues were visibly impressed by the OMV design and Viennese plates”, grins Wolfgang.

Istanbul is a thriving city – and that holds true for their traffic too. And this was the exact spot where the OMV Audi Pilot started off on the 2019 Blue Corridor Rally together with around 15 other CNG-powered vehicles – including a school bus and a massively long bendy bus. “The traffic in Istanbul is unbelievable. The distance to the city's only CNG filling station should have taken around three minutes, but I needed 45 minutes on the absolutely jam-packed roads. That said, the city on the Bosphorus is completely worth the journey: it is a wonderful melting pot of Orient and Occident – there is a huge amount to see”, gushes Wolfgang.

Fact box CNG:

A gas-powered car has a similar range to one with a diesel engine. The costs are around the same and it's just as quick to fill up – at half the price.

On precisely the final weekend of the summer holidays, the convoy headed off from Istanbul towards Bulgaria. This meant long waits: a single 4.4 km stretch took Wolfgang eleven hours of driving, or rather standing still. Without any kind of infrastructure – nowhere to shop or use the bathroom – Wolfgang

spent the time in interesting discussions with his fellow traffic-jam sufferers.

In Bulgaria, Wolfgang enjoyed an outstanding CNG network – 114 filling stations – and a break at an OMV filling station. “It doesn’t matter in which country, whether it’s in a tiny village, the cleanliness and friendly staff made a real impression on me. I was only able to experience filling up with CNG myself in Austria; everywhere else the attendants handled it for me”, says Wolfgang.

The remainder of the journey to Vienna went off without a hitch. After a week in the CNG car and 3,655 kilometers clocked up, the Blue Corridor Rally contestant gave his verdict: “Some countries like Austria, Germany, Bulgaria and Italy have an outstanding network. In others like Turkey there is still room for improvement to say the least. Whether it’s a CNG dispenser out in the sticks, in the middle of nowhere, or at a state-of-the-art OMV filling station, filling up was always no problem at all. I met a lot of

great people on the trip and had a lot of positive experiences. Participating in the rally really paid off”.

Wolfgang Kauer's private car is a Skoda Octavia RS and following this trip he can well imagine switching to a CNG vehicle.

Source: <https://www.omv.com/en/blog/191113-3655-km-with-compressed-natural-gas>



GERMANY. ZWICKAU



The caravan's first stop in Germany was the cozy town Meerane near the city of Zwickau. The round table there was the exact opposite to the event in Vienna. In sunny Austrian capital the roundtable was in the modern eco-friendly headquarters with pond and garden. In the industrial region of Saxony, a meeting was held proper in the factory workshop. During the excursion through the plant, the guests heard the noise of manufacturing, met the workers and engineers, saw the job of machine tools and sparking drills, and even smelled engine oil and welding. NGVs drove inside the factory workshop, complementing the view perfectly.

It was 16 September – a little bit rainy and grey day. In contrast to the weather, the Rally's crew was welcomed very warmly. The host was the Borsig ZM Compression company and its CEO Oliver Kühner.

The atmosphere of manufacturing influenced the entire event. The discussion focused on technical aspects of using gas as motor fuel and ecological advantages of CNG and LNG. Among speakers, there were politicians from the local parliament of Saxony as well as PM of German Bundestag, representatives of Gazprom and Uniper, mayor of Meerane. Prof. Dr. Cornel Stern of Hochschule Zwickau gave a detailed lecture on climate changes and ways to reduce CO₂ emissions. According to the scientist, electricity cannot substitute fossil fuels completely in mobility in coming 50 years. That is why the world inevitably needs natural gas on transport.

Rally Creates Opportunities



Oliver Kühner, CEO at Borsig ZM Compression

In the last years, the CNG activities have not been in the focus of BZM, as the business was negligible.

Due to the very high public attention on climate change, temperature rise, CO₂ emissions in Germany, the Blue Corridor Rally 2019 was an excellent chance to use the attention on "clean fuels".

BZM hosted the Rally for a round table conference which was organised by Zukunft Erdgas. The focus was on a political level to get their attention, as in Germany the focus for mobility is on electric these days. For transportation, CNG/LNG is, in our view, the real existing solution today and thus the round table was an excellent possibility to bring BZM back in the business. The "ZM" in our name stands for Zwickauer Maschinenfabrik and during the days of the Soviet Union, more than 300 compressors have been supplied for the CNG filling stations (AGNKS). In Zwickau, the next bigger city to Meerane, the CNG buses are filled by our compressors every day since more than 10 years! All these compressors have proved by their reliability that there is no technical risk to build a wide net of filling stations all over Europe...

The round table event was only a starting point for us. Together with the Industrie und Handelskammer in Sachsen, we will have a next conference by March 2020 with the focus on heavy duty transport and busses for public transport using CNG/LNG!

So for BZM the Blue Corridor Rally 2019 was the right event to bring us back to the market in Germany.



BERLIN

The next stop of the Rally in Germany was Berlin, where at the roundtable at the EUREF campus, hosted by Zukunft Erdgas Association, over 60 people gathered to discuss gas in transport. On the contrast to the previous event, which highlighted the technical side of the story, here, the focus was on politics and economy. The incentives needed in the sector were the topic of the discussion that involved companies, associations, politicians and experts. Decreasing emissions in transportation is a challenge to be met with the correct decisions on political level. Dmitry Khandoga of Gazprom highlighted that gas needed no advertising, but it deserved a non-discriminatory approach, fair play and political acceptance.

Speaking of varied alternative fuels promoted today, Stephan Kohler of Zukunft Erdgas was convinced: not only power, but also gas can be very well green. For this, a correct approach to emissions is a broader well-to-wheel view. It helps to evaluate emissions all along the production chain of the car and the fuel. Measuring tailpipe emissions might be easy but can lead to distorted results and decisions – something you cannot afford when you need to decrease emissions quickly and efficiently.



On the commercial side, NGV is a rare case where the competition of car producers, otherwise really harsh, works the other way. Stephen Neumann of Volkswagen, leading producers of gas passenger vehicles in Europe, stresses the potential the market yet has to embrace. Even if other producers join the competition, this will, in the end, contribute to overall success story of NGVs, he says. And this applies far beyond road transport. Oliver Grundmann, the Bundestag member of CDU, marked the special potential gas and LNG has in marine transport, where there's no better solution to cut

emission. With new LNG terminal to be built in Germany in the coming years, use of LNG in transport can gain more attention in the country.

And it's at the sea where the third stop in Germany was scheduled. After the talks in Berlin, the rally was heading off to Lubmin on the Baltics, the final point of the European section.



IVECO Stralis

Engine: 8/9/13 l

Fuel: CNG/LNG/
CNG+LNG

CNG Consumption per
100 km

Range on natural gas:
up to 1600 km



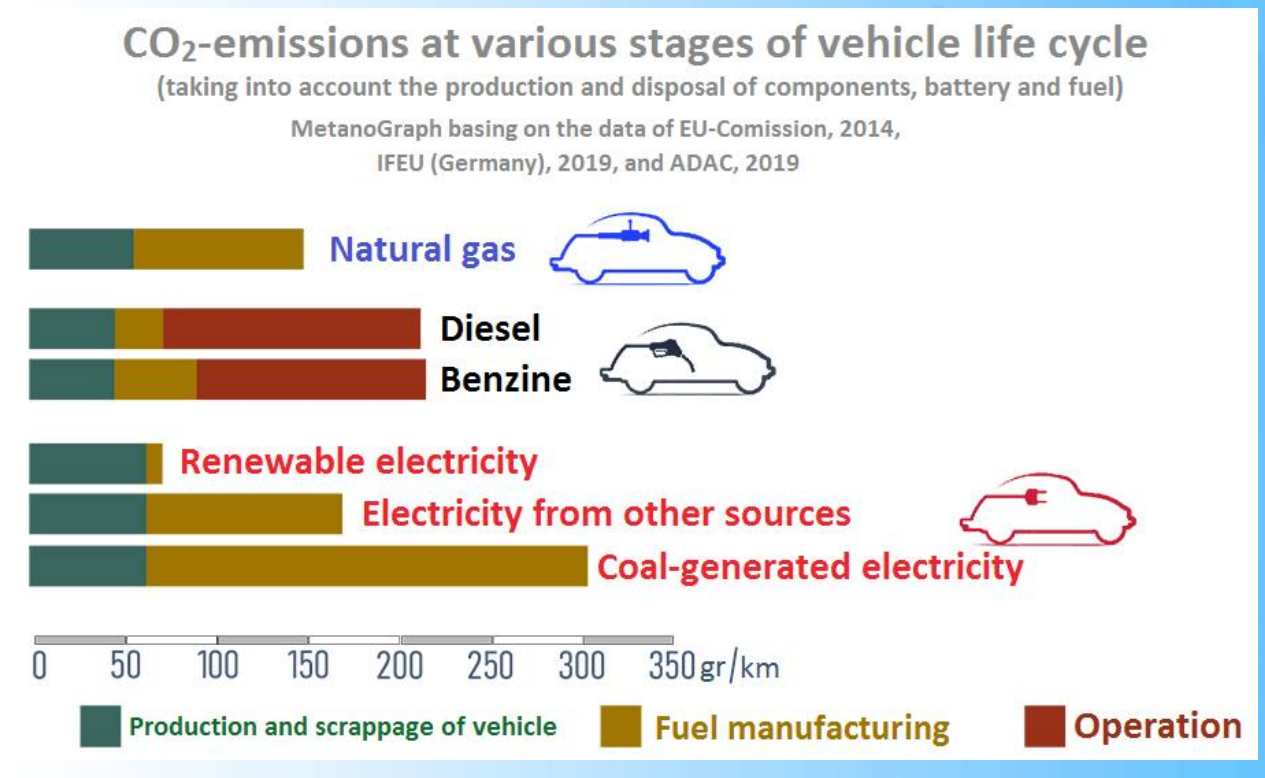
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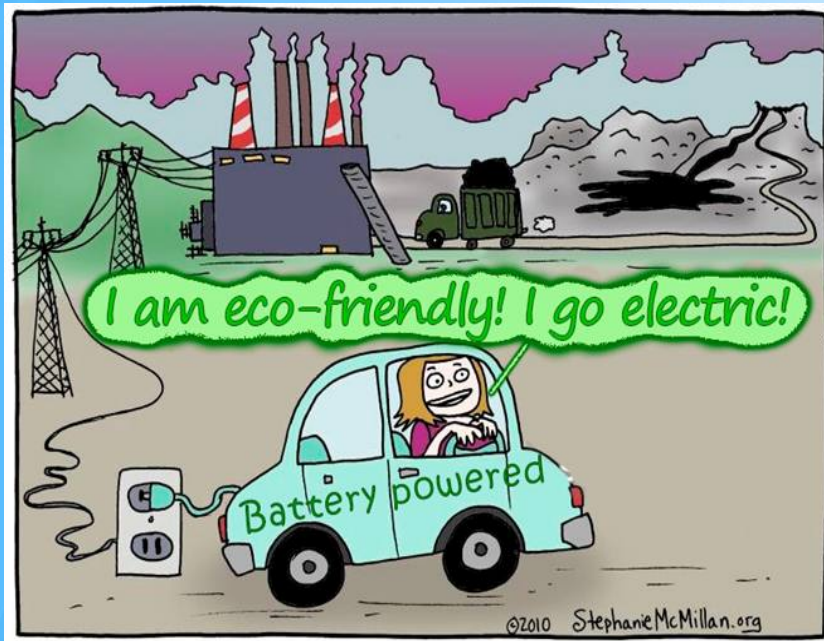
NGV Rally “Blue Corridor” – Back in Europe

What are the most important lessons learnt during the NGV rally Blue corridor - 2019?

European NGV industry lacks fair approach from authorities towards natural gas. CNG and LNG are competing with other alternatives, mostly electricity, which enjoys various administrative and financial privileges. Legislative and executive approaches to fuel alternatives in the European Union are commonly unequal. Electric mobility is granted massive support under the pretext that it is the cleanest option, whereas natural gas is criticized as a polluting fuel.

Not too far ago, in late September 2019, the Joanneum Research Institute made a vehicle life cycle analysis that concluded: natural gas is safer and cleaner than all other transportation fuels, including conventional electricity, especially when it is produced by burning coal. This conclusion is based on a thorough investigation of CO₂ footprint of raw materials to produce fuel and its infrastructure, vehicle & component production, vehicle operation, vehicle & component recycling. The whole life cycle and not just well-to-tank or well-to-wheel-analysis.





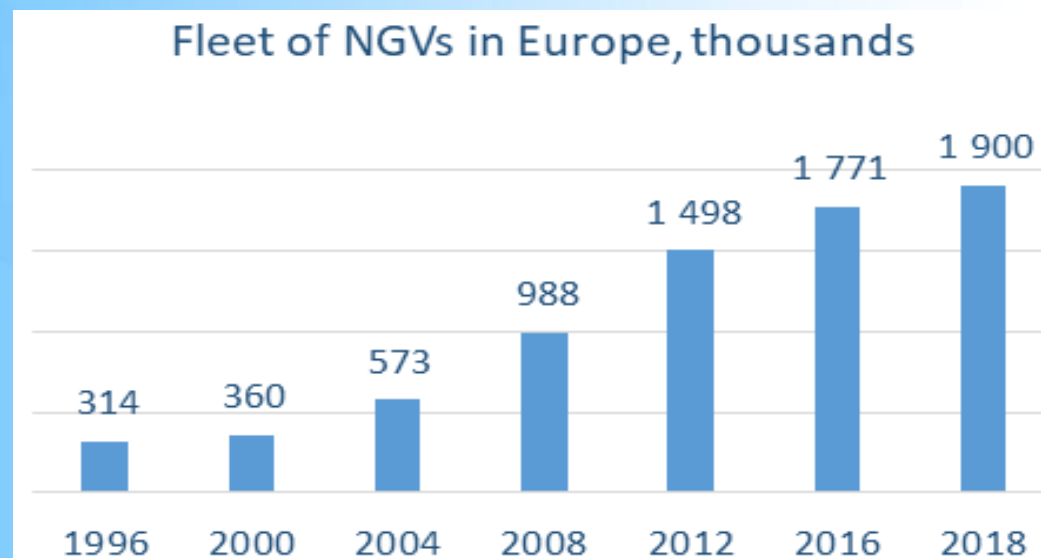
Natural gas needs a fair competition, unprejudiced, responsible, depoliticized, and based-on-facts attitude. This opinion was voiced out at all round tables held during the Blue Corridor rally. Otherwise Europe is taking risk of treating one disease and triggering other.

In parallel to fair competition, natural gas needs a more animated Europe-wide promotional campaign. It is

ridiculous that so far there are a lot of people who are not aware of CNG/LNG and its properties and advantages. Quite many politicians and public officers are not aware of true facts about fuels. This is why NGV community has to continue its communications activities, including NGV rallies, conferences, trade shows. A lot can be achieved with modern digital information tools.

In some countries it is not easy to locate the CNG stations. No road signs, no mobile navigation, difficult driving path, confusing information – all that does not help expand the NGV market.

To conclude these notes on a positive note: it is noteworthy that since the inception of the Blue Corridor Rally in 2008, the European fleet of natural gas vehicles has more than doubled. And it will keep growing. No doubt.



Source: NGVA Europe, NGV Global, NGV Italy

LUBMIN

On the 20th of September, the town of Lubmin hosted the next rally stop. Here, close to the sea, with the sandy shore and smell of pine trees, at the picturesque Kurverwaltung building, the rally has reached its final destination in Europe.

Unbelievably, this lovely quiet town that looks like just created for relax and joy has been playing a major role in the German energy industry for years. A nuclear power station, the biggest one in DDR, worked here for decades. And today, Lubmin is the place where the Nord Stream gas pipeline, supplying Europe with 55 bn gas annually, reaches the German shore. And here, it will be joined by the twin Nord Stream 2 very soon. Axel Vogt, Bürgermeister of Lubmin, values this special role that energy has played in the Lubmin story. At the Round table organized by Zukunft Erdgas, he stressed that energy partnership with Russia has always been successful and reliable, and gas makes an important contribution to safe energy supplies. "It is clear that the energy system cannot be transformed without natural gas", he said. This narrative was supported by Philipp Amthor, a Bundestag deputy and a member of the CDU. He noted the symbolical meaning of the day, as the climate cabinet of German government was deciding on the

energy future of the country. Mr Amthor said that he is optimistic about the role natural gas can play in the future energy mix of the country.

And then, the discussion about the future was followed by some good happenings of today's reality. The five brand new IVECO LNG trucks have been symbolically handed over to the Klaus Wapner logistic company that operates over 100 vehicles. Now these new NGVs will drive the roads of Germany and Europe, contributing to better air quality and cheaper transportation. Mr Norman Wapner of the company said that they had the chance to try LNG vehicles in action and efficiently proved the benefits.

And then, with the new trucks ready to hit the road, and with rally team happy to complete the long route, the symbolic finish of the European part of Rally took place. Per satellite connection, the relay was passed to the Russian section of the rally, which started their way from CS Russkaya where Turk Stream begins. Mr. Igor Fedorov, Managing Director of Gazprom Germania, has stressed the symbolic role of the European rally that has connected the landfalls of Nord Stream, Nord Stream 2 and Turk Stream, proving that natural gas as motor fuel is recognized and demanded across Europe.



Engine: 1.6 CNG

CNG Consumption per 100 km: 6 m³ (4.3 kg)

Volume of gas on-board: 24 m³ (20 kg)

Range on CNG: 400 km



RAPID

Uniper: a Glance from Germany



Uniper Global Commodities in close cooperation with Gazprom Export carried out the European part of the Rally 'Blue Corridor 2019' on the route Istanbul – Belgrade – Zagreb – Ljubljana – Milan – Brussels – Vienna – Zwickau – Berlin – Greifswald. The Rally has proven that the gas station network along the entire route is enough intensive to ensure 100% CNG filling. However, for LNG filling stations this applies only to the network starting from Slovenia.

All ten round tables (RTs) on the route were professionally organized and carried out by local partners, which have been providing natural gas and methane as motor fuel for many years. The RTs in Istanbul and Brussels are to be noted especially, as they impressed journalists and politicians because of the prime location and well-thought-out organization.



I took part in all Blue corridor rallies since 2011, but I should emphasize the high quality of the round tables this year in all ten places.

Detlef Wessling, the head of technical cooperation of Uniper

Car manufacturers as Volkswagen, Audi, Seat, Skoda, Fiat, Iveco (Stralis, Daily) and Scania supported the European part of the Rally. They took part in all stages of the route as well as in NGV-exhibitions. At each RT, they presented various available types of NGVs.

All cars participating in the Rally this year showed their best and proved the reliability and affordability of NGVs.

Andre Schumann, member of Uniper's team in Moscow, longtime participant of the Rally

The RTs focused on different topics due to local differences. Among them are the situation on the market of CNG and LNG as well as various framework conditions as technical standards or governmental funding. For instance, carbon footprint was

not the main theme in Istanbul, where the agenda included such topics as traffic jams and ecological advantages of gas fuel in comparison to petroleum. In Balkan states, we noted the first success of providing CNG, which started ten years ago. Although, LNG is not developed there yet. In this region, we talked mostly about governmental funding of providing natural gas as motor fuel.

Italy is the country with the most intensive network of CNG and LNG stations and the biggest number of NGVs in Europe. That is why in Milan we highlighted the need of expanding the use of NGVs instead of electric cars. This also applies to the RT in Vienna, where the public transport was in the limelight of the discussion.

Three RTs were held in Germany. In the city of Zwickau, which has a 120-year tradition of automobile manufacturing, the focus was on consequences of the transport revolution and the possible production of NGVs. The talk in Berlin touched upon governmental support of natural gas mobility through subsidies or tax policy. We also discussed how electric and gas mobility can help to reach the climate goals of German government.

Vivid discussions during RTs proved that they met the expectations of gas and motor industry representatives and politicians. In many places, journalists took into consideration our mission to improve the situation on the market. The organizers got an opportunity to illustrate the advantages of NGVs in interviews.

Politicians of the countries, where we held the Rally, accepted its message. In Istanbul, high-ranking representatives of four ministries took part in the RT. In Milan – representatives of the local government; in Brussels – three European MPs. Three members of federal and local parliaments took part in all RTs in Germany.

Uniper, as one of the most important players in the European gas market, has participated in the Blue Corridor Rally since 2010. That allows us to support the development and expansion of natural gas sales in Europe. In addition, together with our company LIQVIS, we create and operate the CNG network in Germany and France. We consider the Rally as an opportunity to support this business with certain actions.

We also consider our support for the Rally in Russia as indirect support for our market conditions, because natural gas will be ultimately successful as a fuel only if there is a well-developed network of gas stations outside national borders.



Symbolically, the drivers who covered more than 5,000 km in Europe passed the torch to the participants of the Russian part. And later in October, teams of both sections met in St.Petersburg to join the St. Petersburg International Gas Forum.

Here is the balance we can boast after 23 days on the road: over 40 NGVs, trucks and buses participating, 10 round tables and events held with over 600 people taking place. There is a lot to remember and a lot to await from future Rallies! Good luck and don't hesitate to hit the big road with gas!



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