ANGVA2U Info *20/2020 28th October 2020 (for ANGVA members only)*

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1.0 Selected News / Articles

1.1 Europe

New VW Golf now available to order with natural gas drive

22nd October 2020.

The new VW Golf is now also available in certain markets with natural gas drive: the Golf TGI is equipped with a 1.5-liter four-cylinder engine with 96 kW / 130 PS and three natural gas fuel tanks. The tanks are integrated into the underbody and permit a range of around 400 kilometers (WLTP) in pure natural gas mode.

The engine of the quasi-monovalent drive system is powered primarily with CNG (Compressed Natural Gas), but can also run on gasoline. The total CNG tank capacity is currently 115 liters or 17.3 kg and permits a driving radius of a good 400 kilometers (249 miles) in the WLTP cycle. The Golf TGI is also equipped with a gasoline tank with a useful capacity of 9 liters (2.4 gallons)—this is essentially a reserve tank in case the natural gas should run empty.

WLTP fuel consumption is 4.3–4.1 kg of natural gas per 100 kilometers in combination with CO_2 emissions of 117–111 g/km. The new 1.5L TGI engine in the Golf operates according to the innovative Miller cycle principle, a combustion process that achieves low carbon emissions thanks to its high efficiency and a compression ratio of 12.5:1. At the same time, a turbocharger with variable turbine geometry increases the charge pressure and supplies more air to the cylinders. This allows the Golf TGI to accelerate powerfully from low engine speeds at any time.

Driving in CNG mode produces around 25% fewer carbon emissions than with gasoline. Refueling with biomethane or e-gas results in an even better carbon balance. Biomethane is obtained from waste plant matter, while e-gas is produced from excess green electricity (power-to-gas). These are added to the fuels.

Natural gas also generally combusts with lower emissions than gasoline or diesel. The exhaust gas contains significantly less carbon monoxide and nitrogen oxides (NO_x), while the share of soot or particulates is minimal.

Source: *https://www.greencarcongress.com/2020/10/20201022-golftgi.html*

1.2 Russia

Gazprom opens Europe's largest natural gas filling station in Moscow

28th October 2020. Company News

Russia's Gazprom continues to expand its natural gas vehicle (NGV) business both home and abroad, with of one of Europe's largest gas refueling stations opening in Moscow on Tuesday.

The company said in a statement it commissioned two new stations in the Russian capital, bringing the region's network to seven facilities, **Kallanish Energy** reports.

The station at the intersection of Zenitchikov and Dubravnaya streets is the biggest in Europe with a capacity of 29.8 million cubic meters per year. With 12 filling pumps, the facility has a daily throughput of 1,600 vehicles.

"Natural gas as a vehicle fuel is the key to environmental friendliness, efficiency and safety. The transport sector of any world capital, including Moscow, needs them," said Viktor Zubkov, chairman of Gazprom Gazomotornoye Toplivo.

He added the use of natural gas (methane) is helping to meet the ambitious goal of reducing emissions, saving cities from smoke and improving their quality life.

Gazprom sees the production and sale of natural gas as a vehicle fuel as "strategic," as it creates demand for its core product and reduce carbon emissions compared to traditional fuels. It's developing a NGV market domestically and internationally, particularly in China.

The Russian giant defends methane is "the most economical and environmentally friendly motor fuel," while "methane-powered vehicles have proven their reliability many times during long international motor rallies and sporting events."

The second gas filling station opened in Moscow yesterday is located on Podolsk Cadets street. Its 8.9 Mmcm/y capacity can service 480 vehicles a day.

Source: *https://www.kallanishenergy.com/2020/10/28/gazprom-opens-europes-largest-natural-gas-filling-station-in-moscow/*

1.3 Chile

HAM Chile, a unit of the Spanish LNG Services provider, HAM Group, has been contracted to build Chile's first LNG fueling station

23rd October 2020. By Adnan Bajic

Illustration only (Courtesy of HAM Group)

HAM Chile has been chosen by Lipigas Companies for the design, construction and commissioning of the LNG station.

This will be located at the facilities of Transportes San Gabriel, Linares, Maule Region, very close to the Ruta Cinco Sur (Pan-American Highway in Chile), which is part of the country's mainland communication artery.

Lipigas initiated the project with a view to contributing to its customers' reduction of environmental impact.

The new service station will allow the continuous supply of LNG to a fleet of 30 trucks from Cervecera AB InBev Chile, which will be incorporated into the transport fleet of Transportes San Gabriel.

Lipigas is a relevant player in the energy market in Latin America, with a presence in Chile, Colombia and Peru.

HAM Chile has been operating for several years in South America, with its own facilities and staff in the Santiago metropolitan region. This allows HAM Group to continue the expansion of its infrastructure. This includes the design, construction, maintenance and supply of CNG-LNG service stations, regasification plants (PSR), bunkering, manufacture of cryogenic tanks for LNG and air gases, etc.

Source: *https://www.offshore-energy.biz/ham-to-build-chiles-first-lng-fueling-station/?utm_source=lngworldnews&utm_medium=email&utm_campaign=newsletter_2020-10-26*

1.4 Europe

Kaneka Belgium and De Decker-Van Riet deploy LNG trucks

26th October 2020.

The first LNG truck left Kaneka Belgium in Westerlo-Oevel today on its way to Germany. The new LNG trucks of transport company DE DECKER - VAN RIET will be used exclusively for the international transport of Kaneka MS Polymer.

This partnership enables both companies to combine their policy on innovation and sustainability to contribute towards a better climate and innovation and embed sustainability into their strategy more deeply.

Having obtained the 'Lean & Green' certificate, Kaneka aims to achieve a 22.1% reduction in emissions in its logistics processes. Numerous measures have since been implemented to help achieve this objective, such as the considerable reduction in road transport to ports.

Danny Beyltiens, Supply Chain Manager of Kaneka Belgium NV, said: "Obtaining the Lean & Green certificate challenged us to develop our supply chain even further. Our action plan has been ongoing for four years now and we have already achieved a CO2 reduction of over 20 per cent. The deployment of LNG for international freight transport has officially started the sprint towards the 'Green Star'."

By investing in modern infrastructure for storage and unloading raw materials from ships, 900 ADR trucks were removed from Belgian roads in 2019. The use of LNG trucks for bulk deliveries of Kaneka MS Polymer will streamline the supply chain further.

Christophe Larock, Business Unit Manager Tank Transport at DE DECKER – VAN RIET, said: "For the switch to LNG we have invested in three Scania R410 LNG trucks, exclusively

for Kaneka. These will be used to supply the majority of Kaneka's German MS Polymer customers from the Kaneka site in Westerlo. This partnership is the outcome of many years of strong collaboration with Kaneka and embeds innovation and sustainability even more deeply in our joint strategy."

Source: *https://www.eppm.com/industry-news/kaneka-belgium-and-de-decker-van-riet-deploy-lng-trucks/*

1.5 India

Why are electric cars expensive? The cost of making and buying an EV explained

26th October 2020. ISTBloomberg.

File photo used for representational purpose. ***(Bloomberg)***

- Electric vehicles are more common in global roads than ever before and yet, remain out of budget for many.
- The cost of a battery inside EV forms the major chunk of the final price of the vehicle itself.

At Tesla Inc.'s ballyhooed Battery Day event in September, CEO Elon Musk set himself an ambitious target: to produce a $25,000 electric car in three years.

Hitting that sticker price -- about $13,000 cheaper than the least expensive model today -- is seen as critical to deliver a true, mass-market product. Getting there means finding new savings on technology, most critically the batteries that can make up a third of a vehicle's cost. Musk says innovations and in-house manufacturing can quickly halve that expense, while most competitors see a slower road to reach price parity with gas guzzlers.

1. Why are EV batteries so expensive?

Largely because of what goes in them. An EV uses the same rechargeable lithium-ion batteries that are in your laptop or mobile phone, they're just much bigger to enable them to deliver far more energy. The priciest component in each cell is the cathode, one of the two electrodes that store and release a charge. That's because the materials needed in cathodes to pack in more energy are often expensive: metals like cobalt, nickel, lithium and manganese. They need to be mined, processed and converted into high-purity chemical compounds.

2. How much are we talking?

At current rates and pack sizes, the average battery cost for a typical electric vehicle works out to about $7,350. That's come down a lot -- 87% over the past decade, according to BloombergNEF. But the average pack price of $156 per kilowatt hour (from about $1,183 in 2010) is still above the $100 threshold at which the cost of an electric vehicle should match a car with an internal-combustion engine. That would help trigger mass adoption.

File photo

3. How will the batteries get cheaper?

Costs aren't expected to keep falling as quickly, but lithium-ion packs are on track to drop to $93 per kWh by 2024, according to BNEF forecasts. To get there, one focus for manufacturers

is replacing high-cost cobalt with nickel. That has a double benefit: nickel is cheaper and it also holds more energy, allowing manufacturers to reduce the volume needed. On the other hand, cobalt's advantage is that it doesn't overheat or catch fire easily, meaning manufacturers need to make safety adjustments when they use a substitute.

Panasonic Corp. in Japan plans to commercialize a cobalt-free version of a high-energy battery in two to three years; other suppliers already produce lower-energy ones. There's also attention on the battery packs, often resembling oversized suitcases, that house rows of individual cells. Simplifying the design, and using a standard product for a range of vehicles -- rather than a pack tailored to each model -- will deliver additional savings.

4. Who are the biggest manufacturers?

File photo - The logo of LG Chem is seen at its office building in Seoul, South Korea. ***(REUTERS)***

Asia dominates manufacturing of lithium-ion cells, accounting for more than 80% of existing capacity. The majority of that might is in China. Europe is building new factories and will surpass North America in cell manufacturing starting in 2021, according to Wood Mackenzie Ltd. Overall, the Chinese company Contemporary Amperex Technology Co. Ltd. (CATL) shipped the highest volumes in 2019, including batteries bound for power grids and storage systems. It's a tighter field in the race to supply automakers, where Panasonic led last year.

South Korea's LG Chem Ltd. has surged ahead in 2020, capturing about a quarter of the market in the first eight months, according to SNE Research. Tesla and Panasonic's joint venture is the biggest battery producer in the US Emerging producers include Northvolt AB in Sweden, founded by former Tesla executives.

5. Are all EV batteries the same?

Lithium-ion technology has dominated the rechargeable-battery sector since it was commercialized by Sony Corp. in 1991. Improvements to life-span, power, weight and costs have helped the components leap from camcorders to SUVs, buses and ferries. While lithium-ion cells, like all batteries, have the same basic components: two electrodes -- a cathode and an anode -- and an electrolyte that helps shuttle the charge between them, there are differences in the materials used, and that's key to the amount of energy they hold.

Grid storage systems, or vehicles traveling short distances, can use cheaper and less powerful cathode chemistry that combines lithium, iron and phosphate. For higher-performance vehicles, automakers favor more energy-dense materials, such as lithium-nickel-manganese-cobalt oxide or lithium-nickel-cobalt-aluminum oxide. Further refinements are seeking to improve range -- how far a vehicle can travel before recharging -- as well as charging speed, while also balancing factors like fire-resistance. Recent battery blazes and vehicle recalls have highlighted safety issues.

6. How else can costs come down?

There's the manufacturing process itself and the machinery required. Tesla has commissioned the largest casting machine ever made that'll produce the entire rear section of a car as a single

piece of die-cast aluminum. Integrating the battery with a vehicle chassis could also trim the volume of material used. Electric motors -- which account for as much as a 10th of a car's cost -- should be about 5% cheaper in the next couple of years with improvements to both materials and the electronics that transmit power between the battery, motor and a vehicle's wheels, BNEF says.

7. So China's in pole position?

Yes, in almost every aspect, with some key exceptions. China is responsible for about 80% of the chemical refining that converts lithium, cobalt and other raw materials into battery ingredients, though the metals themselves are largely mined in Australia, the Democratic Republic of Congo and Chile.

China also dominates processes to make battery parts including capacity for cathodes, anodes, electrolyte solutions and separators, BNEF data shows. But China faces a rare challenge when it comes to advanced semiconductor design and software, components that are increasingly important as vehicles become more connected and autonomous. Less than 5% of automotive chips are made in China, according to China EV 100, a think tank. For example, major players in so-called insulated-gate bipolar transistors (IGBTs) include Infineon Technologies AG and Semikron AG in Germany and the Japanese companies Mitsubishi Motors Corp., Fuji Electric Co. and Toshiba Corp. These high-efficiency switches reduce power loss and improve reliability in electric cars.

8. Is cost the only hurdle?

Range remains one of the key focus areas of EV makers around the world. (REUTERS)

There's still an issue with driving range. While the most-expensive EVs can travel 400 miles (640 kilometers) or more before a top up, consumers considering more mainstream models remain anxious about how often they'll need to recharge.

Automakers and governments have become directly involved in the roll-out of public recharging infrastructure, conscious of a need to allay fears over not finding an electric pump on the go. Countries from China to Germany to Canada are building charging stations as part of stimulus measures adopted to combat the coronavirus-induced economic slump. Millions of units are being fitted on highways, in suburbs and at shopping mall parking lots, but distribution is uneven -- more than a quarter of all public connectors in the U.S. are in one state, California -- and not all chargers are compatible with every EV model. Most recharging is expected to take place at home, and that means another cost for consumers, with an average price of about $1,000 per system.

9. What's around the corner?

A host of innovations are seen moving from laboratories to production lines by the end of the decade. California-based Sila Nanotechnologies Inc. is adding silicon into battery anodes in place of graphite to allow a single charge to last at least 20% longer.

Toyota Motor Corp. and U.S. startups including QuantumScape Corp. are racing to commercialize solid-state lithium-ion batteries, which overhaul a cell's architecture to replace the flammable liquids that enable charging and discharging with ceramic, glass or polymers.

That's an advance that advocates claim can boost energy storage, lower costs, improve safety and cut recharging times. CATL is ready to produce a super long-life battery that lasts 16 years and 2 million kilometers (1.24 million miles) -- a typical battery warranty today covers about 150,000 miles or eight years. That means a single pack could be deployed in multiple vehicles or for several different tasks.

As early electric cars retire, there's also a fast-developing sector aimed at reusing batteries for less-strenuous tasks, or recycling the metals within them.
Source: https://auto.hindustantimes.com/auto/news/why-are-electric-cars-expensive-the-cost-of-making-and-buying-an-ev-explained-41603419957680.html

1.6 China

Hydrogen-powered buses enter service in North-East China

26th October 2020. Monday.

CHANGCHUN, Oct. 26 (Xinhua): Baicheng City in northeast China's Jilin Province has put a fleet of 15 hydrogen fuel cell buses into service, the first of its kind in Jilin.

The hydrogen-powered, zero-emission commercial buses were developed and manufactured by Jiefang, a truck subsidiary of China's leading automaker FAW Group. They have a maximum speed of 60 km per hour and can operate smoothly in temperatures as low as minus 30 degrees Celsius, with a refueling time of 15 minutes.

The vehicles are equipped with smoke sensors, automatic fire extinguishers and other safety devices, as well as an intelligent public transport operation system that enables state monitoring and positioning via a mobile phone app. "The buses operating on hydrogen can cut emissions and noise pollution, are easier to drive than standard buses and have a shorter refueling time than pure electric buses," said Lian Xiaojing, manager of the Baicheng bus company.

Several major Chinese cities including Shanghai and Chengdu, capital of Sichuan Province, have made plans to promote the use of hydrogen-powered buses. – Xinhua

Source: *https://www.thestar.com.my/aseanplus/aseanplus-news/2020/10/26/hydrogen-powered-buses-enter-service-in-north-east-china*

1.7 Scotland

Scottish city to have largest fleet of hydrogen dump trucks

23rd October 2020. By Leonard Manson

The Scottish city Glasgow will introduce 19 electric garbage trucks powered by hydrogen fuel cells in its system after receiving a sum of 6.3 million euros (R $ 41.89 million) from the UK government – responsible for financing the Hydrogen for Transport Program, with a fund of 23 million euros (R $ 152.93 million).

According to Transport Minister Rachel Maclean, this will be the "world's largest fleet of such vehicles", and the initiative shows that "the UK is at the forefront of green transport technology." As part of a broader strategy to support infrastructure growth, a new resource replenishment station is also planned.

Last month, three energy companies announced a partnership called Green Hydrogen for Glasgow, created with the aim of offering marketing solutions to reduce gas emissions – resulting in the proposal to install a non-fuel production chain pollutant around the region.

Glasgow, which would host the United Nations Conference on Climate Change in November, postponed to November 2021 due to the covid-19 pandemic, aims to become the UK's first zero-carbon city by 2030.

Sustainable solutions

In recent years, the movement of carbon removal from the UK transport sector has gained momentum, and last week, the first hydrogen-powered train, the HydroFLEX, was tested – something made possible by a donation of 750,000 euros (almost R $ 5 million) from the Department of Local Transport and investments of more than 1 million euros made by the railway company Porterbrook and the University of Birmingham.

Other actions involve making the Vale of Tees region, northeastern England, a "pioneering hydrogen transport hub" and investigating how new it can supply buses, trucks and rail, sea and air transport across the country.

Source: *https://www.somagnews.com/scottish-city-to-have-largest-fleet-of-hydrogen-dump-trucks/*

2.0 ANGVA's Mission Statement

On 22nd October 2020, ANGVA's Board of Directors (Executive Committee Members) adopted a mission statement for the association as follows:

"Together we propagate and support the efficient utilization of low to zero and carbon neutral fuels for cleaner air and better life in the Asia Pacific Region".

Brief on ANGVA's Mission Statement:

a. *ANGVA base is Natural Gas Vehicles (NGV) using fossil Natural Gas (NG) as fuel in the form of CNG and LNG, thus ANGVA will continue to propagate NG as a Low Carbon Fuel for the transport sector.*
b. *Moving ahead ANGVA will focus also on bioCNG and bioLNG from upgraded Biogas (known as Renewable Natural Gas (RNG) or Biomethane), which is considered zero and carbon neutral fuel. The deployment of bioCNG and bioLNG can be achieved quickly as it can complement the use of CNG and LNG, and can utilized existing NG infrastructure.*
c. *Moving ahead, especially for the long-term, ANGVA will also focus on Hydrogen as a Zero Carbon fuel for the transport sector. Besides CNG, LNG, bioCNG, bioLNG and Hydrogen, other low, zero and carbon neutral fuels such as Electricity (for EVs), Biodiesel, Renewable Diesel, ElectoFuels, Synthetic Fuels, etc., will also be of interest to ANGVA.*
d. *The word "Together" in the mission statement reflects that ANGVA is an association, where everyone come together to propagate low, zero and carbon neutral fuels for a cleaner air and better life in the region.*

End