

ANGVA2U Info 5/2018. 16th August 2018. (for ANGVA members only)

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1.0 Supplying Natural Gas to NGV Refueling Stations

Natural gas can be supplied to NGV refueling stations via pipeline or pipeless / virtual pipeline system. Pipeless or Virtual pipeline system uses CNG and LNG trucks to transport natural gas to the NGV refueling stations. Despite the cost of transporting by trucks were more expensive than transporting via pipelines, many countries in the Asia Pacific region have proceeded to such system for strategic reasons or in some cases there are still reasonable profit margins to be made via supplying gas through trucks.

The economics of whether to transport natural gas using CNG or LNG trucks will depend on the Gross Vehicle Weight (GVW) of the trucks, distance travelled and volume transported. Deployment of LNG trucks will depend on the availability of LNG supplies either through local Liquefaction Plants or LNG Import Terminals. Figure 1 below showed roughly which system to deploy based on the distance and volume of gas to be transported.

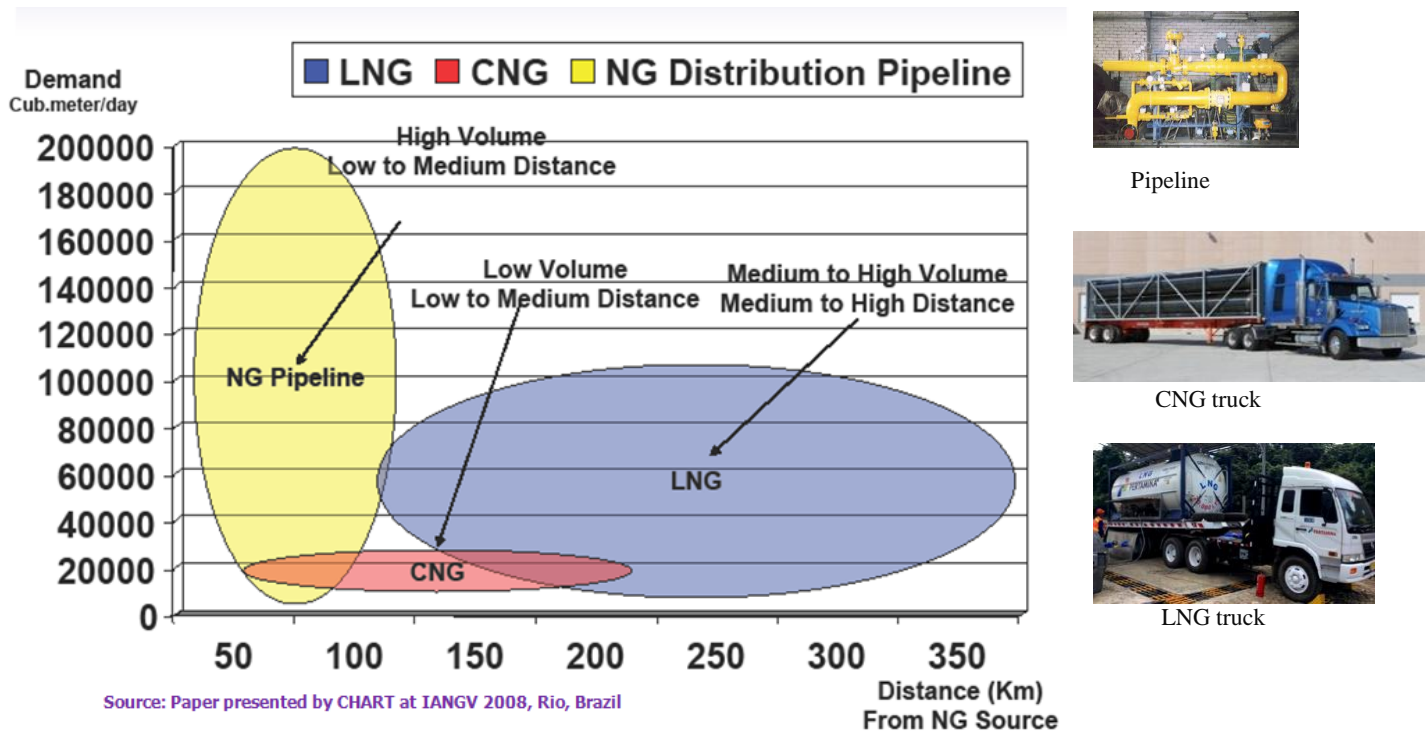


Figure 1: Comparison between transporting natural gas via pipeline, CNG and LNG

LNG supplied by LNG trucks to NGV refueling stations can be used to dispense LNG directly into LNG vehicles or vaporized first and then dispense as CNG into CNG vehicles. See Figure 2. Examples of LNG and LCNG stations are shown in Figure 3.

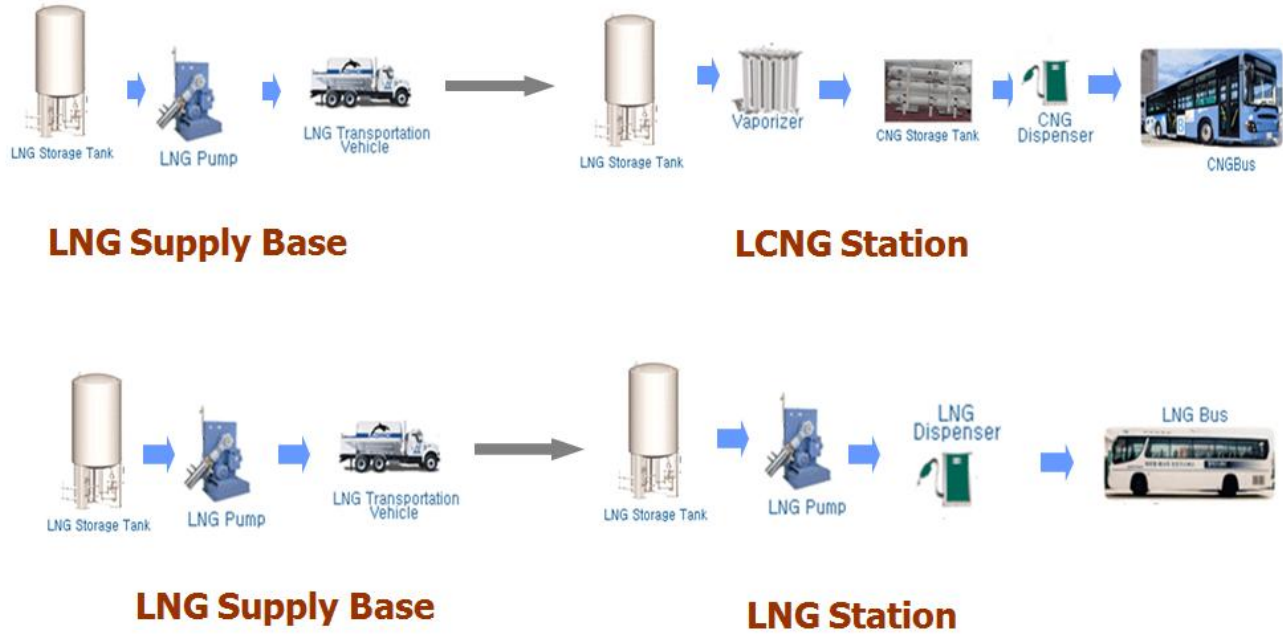


Figure 2: Supplying LNG to NGV Refueling Station (LNG or/and LCNG stations)



Figure 3: Examples of LNG and LCNG stations

2.0 Selected News

2.1 China

WoodMac: China trucking LNG to cope with limited pipeline coverage. 28th June 2018.

China's LNG demand growth, boosted by the government's policy to switch from coal to gas to curb air pollution, has brought a new set of challenges for the country with limited pipeline coverage and lack of storage facilities.

China's gas demand has risen by more than 17 percent over the last year, with industrial coal-to-gas switching accounting for 40 percent of this growth. A further 30 percent of this came from new connections in the residential and commercial sectors, natural resources consultancy WoodMackenzie notes.

As a result, the country's LNG imports jumped by 12.1 million tons in 2017, totaling 38.3 million tons. But delivering the chilled fuel to the northern and eastern regions that saw peak utilization reach 119 percent and 159 percent, respectively, during the 2017/2018 winter, hampered the supply-demand balance. WoodMac added that trucking LNG to the regions provided coverage, however, due to its complexity and the distance across which the LNG had to be delivered, saw the prices spiking to \$30/mmBtu.

By the end of 2017, China had 17 LNG receiving terminals in operation, mostly in the south. LNG trucking provided the link to the northern and eastern regions, delivering 12 percent of China's total gas demand. With trucks ferrying imported LNG as well as domestic liquefied natural gas, the amount of the chilled gas delivered this way grew three times compared to 2012, WoodMac says.

However, despite the expenses, trucking LNG to markets with limited pipeline access is still seen as a solution, although it is expected that measures have been taken by market participants in order to cope with new winter gas shortages.

Source: https://www.lngworldnews.com/woodmac-china-trucking-lng-to-cope-with-limited-pipeline-coverage/?utm_source=emark&utm_medium=email&utm_campaign=daily-update-lng-world-news-2018-06-28&uid=46966

2.2 Indonesia

Shell seeking permit to import LNG into Indonesia 18th July 2018.



Image courtesy of Shell

The Hague-based LNG giant Shell with partners is looking for a government approval to import liquefied natural gas into Indonesia. Speaking to the media, Indonesia's oil and gas director general Djoko Siswanto said the company has proposed the LNG imports to the government, however, it has not been approved yet, Reuters report.

The government has, in turn, requested Shell and its partners to present a plan to the government. The buyer for the volumes has already been found by Shell, and the company intends to build a liquefied natural gas import terminal in Indonesia, although Siswanto has not named the buyer.

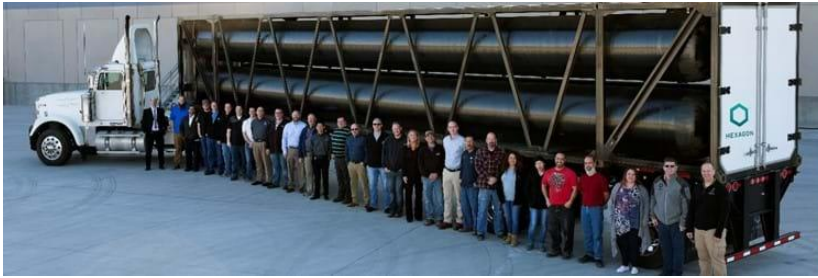
The government also noted that any imports by Shell and its partners should not interfere with the domestic LNG producers' attempts to find buyers.

Source: https://www.lngworldnews.com/shell-seeking-permit-to-import-lng-into-indonesia/?utm_source=emark&utm_medium=email&utm_campaign=daily-update-lng-world-news-2018-07-18&uid=46966

2.3 USA – Transporting natural gas using CNG trucks

Hexagon awarded the first order for the new TITAN®53 Mobile Pipeline® gas transport module, employing largest composite cylinders in the world. 14th August 2018.

Hexagon Composites' subsidiary Hexagon Lincoln has been awarded a substantial order for the new TITAN® 53 transport modules from Xpress Natural Gas LLC (XNG) a leading full-service provider of CNG Mobile Pipeline®, with a total value of USD 10.6 million (approx. NOK 86 million).



The large-capacity Mobile Pipeline® modules will serve virtual interconnects projects in the U.S., connecting communities and facilities to the gas grid. The 53-foot-long TITAN®53 was launched at the World Gas

Conference in Washington D.C. in late June 2018 and is the most recent example of how Hexagon is adapting its leading composite pressure vessel technology for a wide range of applications for compressed natural gas, hydrogen and industrial gases.

TITAN®53 (designed to optimize weight and capacity to meet the 80,000 lbs GVW limit in most of the US, delivering an estimated gas volume of 492,000 scf (13,932 scm), delivers almost 40% greater payload than the first TITAN® modules while retaining all the advantages of Hexagon's Mobile Pipeline® platform to deliver a lower cost of ownership. TITAN®53 is ideally suited to the U.S. market, able to meet GVWR (gross vehicle weight rating) requirements in all 50 states. It targets energy intensive industries wishing to convert to clean and cost-effective natural gas, virtual interconnects, gas islands, vehicle refueling and transport of industrial gases.

"XNG was a pioneer of CNG Mobile Pipeline®. Our first transport modules were the TITAN®4 from Hexagon and they've been the work horses of our fleet. As the industry has grown, we've needed to become more competitive and that means investing in the state of the art. We're excited to be the first to market with TITAN®53; the higher capacity and weight efficiency in a product that we are intimately familiar with is exactly what we were looking for," said John Nahill, President and co-founder of Xpress Natural Gas. "We also appreciate Hexagon's service team. Their support has allowed us to maximize our dispatch reliability. It was a key factor in our decision to lead with TITAN®53.

"Hexagon is building momentum for a cleaner energy future with the unveiling of the new TITAN®53 gas transport module, which employs the largest composite cylinder tanks in the world. After nearly a decade of success with TITAN® products, customers are requiring the ability to move greater volumes of compressed gases," said Miguel Raimao, Vice President Mobile Pipeline® at Hexagon Lincoln.

The United States Department of Transportation (U.S. DOT) recently granted Hexagon Lincoln special permit for TITAN®53. Deliveries of the TITAN®53 modules are scheduled to commence in the fourth quarter of 2018 and continue through first quarter of 2019.

Source: <https://www.nasdaq.com/press-release/hexagon-awarded-the-first-order-for-the-new-titan53-mobile-pipeline-gas-transport-module-employing-20180814-00080> & www.hexagonlincoln.com

3.0 ANGVA Membership

As of 7th August 2018, ANGVA has 64 members from 17 countries. Memberships comprises of 19 Class A members, 0 Class B member, 34 Class C members, and 11 Class D members. ANGVA Board had decided that Class B membership is no longer available. Those applying to join Class B membership will be requested to apply to join as Class A members instead.

ANGVA appreciates and value the membership of its members. By being members of ANGVA mean you support the NGV industry and its development and growth. Your membership helps ANGVA to continue its mission of developing and growing the NGV markets in the Asia Pacific region.

Currently there are members that had not paid their memberships fees, some had not paid for 2016, 2017 & 2018, some for 2017 & 2018, and some for 2018. For those not paid for 2016, 2017 & 2018 their memberships will be automatically terminated as per ANGVA Rule 7.4. (*Rule 7.4: Any members who allow his arrears to exceed two (2) annual subscriptions shall automatically cease to be a member of The Association unless the Executive Committee expressly rules otherwise.*).

An association is only as strong as its memberships thus we hope members will continue their memberships in ANGVA by paying their annual membership fees on time. Please inform us if there is anything that we can do to serve you better.

4.0 Event

Mark your calendar to be at the 8th Annual LNG Transport, Handling and Storage 2018 Forum that will take place at Padma Resort, Bali, Indonesia, 4th – 7th Sept 2018. This event is endorsed by ANGVA.



More information on this LNG Forum can be viewed at: http://www.lng-world.com/lng_bali2018/

5.0 End

Any comments and suggestions on the topics and information covered and to be covered in future are most welcome. Please send your comments and suggestions to Lee Giok Seng at email: leegs@angva.org