

ANGVA2U Info 6/2018. 24th August 2018. (for ANGVA members only)

ANGVA2U Info aims to share information, data, and news related to NGV with ANGVA members. However, these information, data, and news are collected and shared in good faith, without any guarantees of accuracies. Members are advice to use these information and data prudently and at their own risks.

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1.0 Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) Vehicles

Both CNG and LNG vehicles are categorized as Natural Gas Vehicle (NGV) as both utilized natural gas as fuel for their engines. The major different between them is the way natural gas is stored onboard the vehicles i.e. either in the form of CNG or LNG. CNG is pressurized natural gas stored at 200 bar (3000 psig)* in cylinders onboard vehicles. LNG is natural gas in its cryogenic liquid form stored at around minus 162 °C in double-walled, vacuum-insulated pressure tanks onboard vehicles.

**Note: In USA, 250 bar (3600 psig) onboard vehicle storage cylinders are also utilized besides the more commonly use worldwide storage pressure of 200 bar (3000 psig). To prevent filling of 250 bar gas into 200 bar system, the refueling station dispenser nozzles and vehicle receptacles of each system are made incompatible to each other.*

LNG is most suitable for vehicles needing a longer range because more energy can be stored by volume in a given tank in liquid form. LNG is typically used in medium and heavy duty vehicles such as trucks and buses.



CNG car



CNG Bus



CNG Truck



LNG Bus

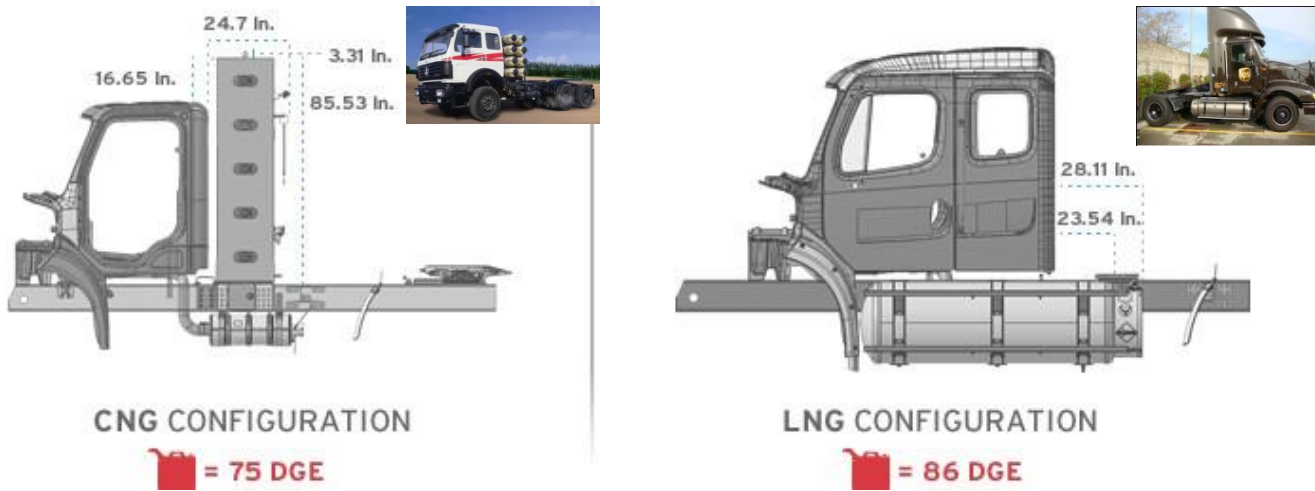


LNG Garbage Truck



LNG Mining Truck

Comparison between CNG and LNG onboard storage systems:

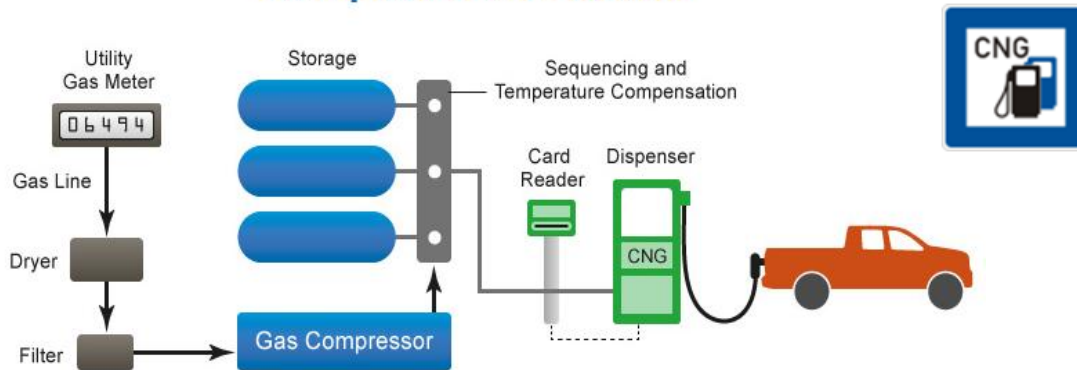


DGE = Diesel Gallon Equivalent. This is based on energy equivalent of one gallon of diesel. (1 US gallon = 1.78541 litre)

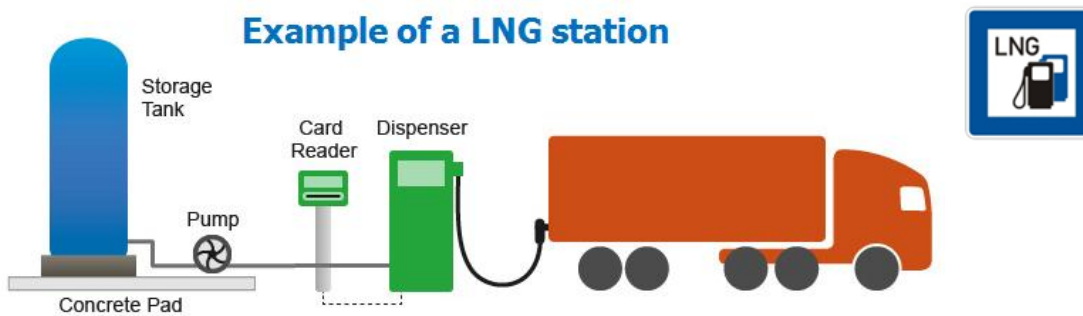
The term / unit DGE is use in USA to retail natural gas (in the form of CNG or LNG) to vehicles as alternative to Diesel. Similarly, the unit GGE (Gasoline Gallon Equivalent) is use when retailing CNG as alternative to Gasoline in the USA. The units DGE and GGE are similar to the unit lpe (litre petrol equivalent) that is use to retail CNG in Malaysia and Indonesia. Most countries in the Asia Pacific region retail CNG either in unit of per kg (e.g. Thailand, India, Pakistan, Myanmar) or per m³ (e.g. China).

Comparison between CNG and LNG Refueling Stations:

Example of a CNG station



Example of a LNG station



Selected News

2.1 Bangladesh

LNG supply begins in Chittagong. 20th August 2018.



Source of picture: www.lngworldnews.com/excelerate-commissions-bangladeshs-first-lng-terminal
Excelerate Energy's FSRU Excellence (Image courtesy of Excelerate Energy).

Supply of liquefied natural gas in Chittagong began Saturday noon through an undersea pipeline from a ship at Moheshkhali LNG Terminal, Cox's Bazar.

Both the existing and new consumers in Chittagong are the first recipient of the gas, said Karnaphuli Gas Distribution Company Limited managing director Khaiz Ahmed Majumder. He told New Age that LNG started to flow in Chittagong through the 91 km undersea pipeline of KGDCL linked to the grid of Anwara.

The LNG supply is expected to address the gas crisis faced by the port city. Every day the city requires 550 mmcf but it gets 180-200 mmcf. Due to gas crisis, industries were facing severe problem in Chittagong, said KGDCL MD, hoping that gradually there would be no more of the crisis.

In the first phase, 75 million cubic feet of gas of the imported LNG is being supplied to the city. After September 4, the pressure of gas would increase.

Earlier on April 24, the ship Excellence reached the Moheshkhali LNG terminal with 136,009 cubic metres of fuel from Qatar. Since then, several deadlines expired for gas transmission to the reservoir in last three months due to adverse weather and technical issues.

Source: www.newagebd.net/article/48845/lng-supply-begins-in-chittagong

2.2 Thailand

Huge rise in price of CNG. 16th August 2018.



Compressed natural gas prices will rise by almost 40% this evening. Photo by Thiti Wannamontha)

The pump price of compressed natural gas will jump 37% on Thursday evening, to bring it in line with the global oil price, PTT announced on Thursday.

PTT president and chief executive Tevin Vongvanich said the retail price of CNG, marketed as NGV, will rise to 14.58 baht per kilogramme "this evening". He did not specify the exact time.

The new price is a 37% rise on the present price tag of 10.62 baht/kg. It will not apply to local public buses operated by the Transport Co and the Bangkok Mass Transit Authority, he said.

However, interprovincial buses operating under Transport Co licences, and all other vehicles, will have to pay the new price.

CNG is widely used as an alternative fuel for private vehicles, along with liquefied petroleum gas (LPG), and is also used in bi-fuel (sic: dual-fuel) modified diesel vehicles such as trucks, pickups and public transport.

The wholesale price of CNG used in the transport sector is totally controlled by PTT. Retailers such as Bangchak, Scan Inter and Susco set their own pump prices.

The CNG price increase comes after the rise of crude oil prices in the global market. The rose from US\$38 in 2016 to \$60 or more this year. Prices of oil and natural gas normally work in tandem. Source: www.bangkokpost.com/news/general/1522850/huge-rise-in-price-of-cng

2.3 Malaysia

Global Energy Ventures: GEV to pursue Malaysian Gas with Tamarind Resources.

17th August 2018.

ASX Announcement.

GEV PURSUES MALAYSIAN GASFIELDS JOINTLY WITH TAMARIND RESOURCES

KEY HIGHLIGHTS:

- *Global Energy Ventures Ltd and Tamarind Resources Pte Ltd have signed a Letter of Intent (LOI)*
- *Under the LOI, the parties will jointly identify, evaluate and pursue an interest/operatorship in gasfields in the Malaysian region for commercialisation via GEV's proprietary CNG Optimum Technology;*
- *GEV is proposing to use its CNG Optimum 200 MMscf ships to export natural gas to markets within a 2,500 km distance; and*
- *The parties have already identified a potential offshore field, which is being actively pursued with the appropriate authorities.*

Global Energy Ventures Ltd (ASX:GEV), a developer of global integrated compressed natural gas (CNG) projects, is pleased to advise that it has entered into a Letter of Intent (LOI) with Tamarind Resources Pte Ltd (Tamarind), an oil and gas operator headquartered in Kuala Lumpur, Malaysia.

The aim of the LOI is to jointly identify, evaluate and pursue an interest/operatorship in gasfields in the Malaysian region, using GEV's proprietary CNG Optimum technology and CNG Optimum 200 MMscf ships to export gas to markets within a 2,500 km range.

Under the LOI, both parties have already established a commercial case for a particular offshore Malaysian gas field, and have since expressed their interest to the authorities to conduct further due diligence and potential interest/operatorship in such field.

GEV will continue to provide an update of further developments as they occur.

Chairman & CEO Maurice Brand said: "Malaysia has a number of stranded gas fields. We have considered for some time that the GEV CNG solution would be the best commercial outcome for all parties. Our business model includes working with well resourced groups who also have in-country expertise. We are pleased to enter into this LOI with Tamarind, who can provide that complimentary fit with the GEV strategy."



Figure 1: South East Asia Gas Markets up to 2,500km

CNG SHIP SPECIFICATIONS		CNG OPTIMUM 200MMSCF SHIP		CNG PARAMETERS (CHABAHAR TO INDIA)	
185m	Length			6	Number of Ships Required
16.8m	Moulded Depth			220 MMscf	Gross Loaded Volume per ship
31m	Moulded Breadth			>10.5m	Required Water Depth in Port
9.2m	Fully Ladened Draft			15 knots	Average Cruising Speed
~45,600 t	Displacement				
		STORAGE SPECIFICATIONS			
		3,600 psi; 24.8 Mpa	Gas Loading Pressure		
		X80 Pipeline Steel	Type of Pipe		
		108m	Individual Pipe Length		
		~200km	Total Pipeline Length		

Source: www.marketscreener.com/news/Global-Energy-Ventures-GEV-to-pursue-Malaysian-Gas-with-Tamarind-Resources--27125455/ & <https://gev.com/cng-optimum/>

3.0 ANGVA Membership

ANGVA is happy to welcome Cenergi SEA Sdn Bhd as a Class A member of ANGVA.

Cenergi SEA Sdn Bhd, formerly known as Camco SEA, was established in 2010. Cenergi aims to become the leader in bioenergy project development in Southeast Asia, as well as the region's fully integrated energy services company in energy efficiency. Cenergi's mission is to turn emissions into energy, and policy into actions in the Southeast Asia region.



Today Cenergi is one of the largest grid-connected Palm Oil Mill Effluent (POME) biogas players in Malaysia owning and operating four plants that together generate 5.5 MW of power, with another 1.5 MW biogas plant to be commissioned this year. By 2021, Cenergi aims to have 100 MW of operating clean energy assets and a total investment of RM 300 million in Energy Savings Performance Agreements (ESPA) projects.

Cenergi has joined ANGVA to participate in the development, promotion and growth of the Renewable Natural Gas/ Biomethane / BioCNG industry in particular for the utilization of this renewable energy by the transport, industrial and commercial sectors in the South East Asia region.

For more information on Cenergi SEA Sdn Bhd please visit www.cenergi-sea.com

4.0 Events

Following are coming events that are endorsed / supported / organized by ANGVA:

No	Events	Location	Date
1	8 th Annual LNG Transport, Handling and Storage 2018 Forum. (ANGVA endorsed event. Organized by AEG).	Padma Resort. Bali, Indonesia.	4 – 7 th Sept '18
2	11 th Environmentally Sustainable Transport Regional Forum (11 th EST). (Organized by United Nations Centre for Regional Development – UNCRD. ANGVA participating).	Ulaanbaatar, Mongolia	2 – 5 th Oct'18
3	12 th Natural Gas Vehicles & Infrastructure Indonesia Forum and Exhibition. (ANGVA endorsed event. Organized by AEG)	Shang-rila Hotel, Jakarta, Indonesia	8 – 10 th Oct'18
4	36 th ANGVA Board Meeting. (ANGVA's event)	Shang-rila Hotel, Jakarta, Indonesia	8 th or 9 th Oct'18
5	International Energy Agency Advanced Motor Group (IEA AMF) 36 th Exco Meeting. (Organized by IEA AMF. ANGVA participating as Observer)	Hotel Le Meridian, New Delhi, India	15 – 18 th Oct'18
6	5 th LNG Supply, Transport and Storage Forum 2018. (ANGVA supported event. Organized by AEG).	SMX Aura, Manila, Philippines.	24 – 26 th Oct '18
7	LNG Supply, Storage and Transportation South Asia Forum 2018 Forum. (ANGVA supported event. Organized by AEG).	Meridian Hotel, Dhaka, Bangladesh	19 – 21 st Nov'18
	Other events and activities that ANGVA will organize, participate, support and endorse on case-to-case basis.	To Be Advised (TBA)	TBA

For more information on the above events, please contact ANGVA Secretariat.

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