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Indian companies want LNG to help meet transportation needs and reduce operation costs

Petronet LNG Ltd is betting big on the usage of LNG as a fuelling option to meet India’s transportation requirements, Prabhat Singh, Managing Director & CEO, PLL, said. “We are awaiting a green signal from the government following a proposal to the Ministry of Road, Transport and Highways to use LNG as a fuel in vehicles along with other existing fuels,” he said.

LNG, which is cheaper than CNG, is not an approved fuel for vehicles right now. However, its widespread usage will reduce the cost of road transportation as well as the country’s dependence on crude oil requirements, he told.

India consumes about 195 million tonnes of crude-based oil products today and the figure is likely to go up to 230 million tonnes by 2022, resulting in more dependence on crude and additional foreign exchange spending. Given the low processing cost to convert LNG as fuel compared to other fuelling options, he said the differential savings in terms of energy equivalence would be $12 dollar per barrel compared to crude.

“When we are graduating for a better fuel for the future, there will be savings in our foreign exchange kitty and increase in fuel quantity,” he said.

To create awareness on the usage of natural gas for road transportation, he said PLL has approached Tata Motors to procure 100 trucks with LNG fuelling options to operate in the country.

“We are exploring options to deploy some of these trucks initially in Kochi-Mangaluru stretch on a pilot basis by outsourcing it to fleet owners,” he said. The new government in Kerala is very positive on this move and has assured to hand over the required land at 3-4 locations to set up LNG filling stations and storage units.

The Kerala Government is in the process introducing 1,000 buses to run on CNG fuel. “We have mooted a proposal to convert at least 100 buses to LNG fuel for inter-city movement,” Singh added.

Infrastructure

Considering the low capacity utilisation of natural gas in the country, Singh emphasised the need to improve the infrastructure like pipeline connectivity and re-gasification plants. Citing the case of lower capacity utilisation of Kochi LNG terminal costing the company an annual loss of approximately ₹350 crore, he said free flow of gas will ensure an uninterrupted fuel supply.

Answering a question on the progress of the much delayed pipeline connectivity from Kochi terminal, Singh said that IL&FS has bagged the contract for the spread I of 90 km in the Kochi-Koottanad-Bengaluru-Mangaluru project, which is expected to be completed in 24 months.

Petronet has signed a MoU with the Inland Waterways Authority of India to set up LNG filling stations in three locations along the NW-1 for fuelling barges. Discussions are also on to covert diesel barges into natural gas and efforts are on for preparing a feasibility report to enable LNG bunkering for coastal shipping movements in the Indian peninsula.
India looks for Norwegian know-how in natural gas

Innovation Norway, DNV GL and the Norwegian Embassy organized a seminar in New Delhi recently to display Norwegian expertise within natural gas, and to address the challenges and opportunities in the evolving market in India. The seminar provided unique opportunities to get the latest on industry developments, driving technologies, safety guidelines and operational issues.

“India wants to combine economic growth with low carbon emissions, and aims to deliver electricity 24X7 to all Indians. Norway aims to be your partner in achieving these goals”, said Ms Hanne Meldgaard, Minister-Counsellor, Norwegian Embassy, expressing hope for an even stronger partnership on energy and maritime between India and Norway in the future.

Inland Waterways Authority of India, represented by Shrikant Mahiyaria, said “India is keen to promote LNG as bunker fuel for sustainable and efficient inland transportation. I am sure that the bilateral cooperation between Norway and India will grow in this sector”.

The rapid economic growth in India is highly dependent on an increased supply of energy. Small-scale distribution of LNG will be used to fuel up smaller power plants, industry users and as fuel for ships. There is a positive environmental aspect of using LNG as an alternative to heavy fuel oil.

Globally there are now another 50 LNG vessels under construction, of which 20 are Norwegian owned.
Storage facilities to support inland LNG shipping

Haldia Dock Complex under India’s Kolkata Port Trust has recently earmarked about 10 acres of land for a period of 30 years for setting up of LNG storage facilities set to support the use of LNG as fuel for barges.

India’s government, in an attempt to curb emissions, is taking measures to facilitate the movement of LNG and its storage at places situated along the inland waterways, a statement by the Ministry of Shipping reads.

The Ministry of Shipping has been holding discussions with Petronet LNG and Inland Waterways Authority of India, with Petronet currently in the process of preparing a detailed feasibility report for setting up LNG facilities at Haldia, Sahibganj, Patna and Ghazipur on NW-I (river Ganges).

During a meeting AWAI provided Petronet with projections on the cargo and pattern of traffic on the NW-I in order for Petronet to estimate the demand for LNG on the waterway.

The ministry also noted that Indian shipyards are entitled to the 20% subsidy for the construction of LNG barges.

Petronet has been requested to present the necessary infrastructure for moving LNG as fuel for barges.

Setting up of LNG storage hubs along the river Ganges could facilitate potential gas consumers in the hinterland as LNG could replace LPG, naphtha and HFO fuel and serve as fuel in a number of industries including the road transport sector, the ministry said.

Petronet has also been directed to investigate the potential of using LNG barges on the waterways of Goa and Maharashtra, while the option of using LNG-powered vessels on NH-5 has been discussed at the last meeting.

Use of LNG is one of the solutions for a greener energy sector in India. “LNG is a key feature of India’s future plans for a sustainable energy sector. This cannot be complete without Norway, because of your experience”, said Sunjay Sudhir, Joint Secretary of the Ministry of Petroleum and Natural Gas.

With two decades of experience, Norwegian companies develop and deliver products along the entire LNG value chain. Norway has developed small-scale LNG infrastructure for more than 10 years and has today around 40 distributed LNG terminals along the coast and 50 LNG-propelled vessels in operation.

This makes Norway one of the pioneers in this business, and it has “propelled” the development of highly skilled Norwegian vendors and suppliers of equipment and services in this sector.

According to DNV GL there will be 1,000 vessels operating on LNG within 2020. LNG propelled vessels can significantly contribute to reduced emissions, both for the Norwegian short sea fleets and for deep-sea transportation.

The Norwegian Government has also developed and implemented a specific Maritime Strategy during the last 7 years that focus on cleaner and greener shipping. By combining financial instruments like a NOX fund, reduction of port taxes and duties, implementing ship scrapping regimes for those ship-owners selecting to renew their old ships with LNG propelled ships, promoting development of small scale LNG distribution, etc. it is possible for governments to be a catalyst in facilitating a change to clean short sea shipping within a limited number of years.

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New filling station offering CNG opens in Abu Dhabi

Saeed Mubarak Al Rashdi, Acting Chief Executive Officer of ADNOC Distribution, opened Al Bahya Service Station in Abu Dhabi at an event attended by senior ADNOC Distribution officials, key stakeholders. The opening of the new facility articulates ADNOC Distribution’s strategic plan to expand its station network to meet the growing customer demand for its services and products, while keeping up with the continued population growth and urbanisation in the UAE.

Fitted out with the latest equipment, the new refuelling station comprises seven islands in which 12 fuel dispensers offering natural gas, E-Plus 91, special 95, super 98, and diesel.

Following the opening ceremony, Al Rashdi said: “At ADNOC Distribution, we pursue an ambitious expansion plan that seeks to achieve excellence in service delivery, and empower daily lives of the community we serve. In addition supporting the country’s sustainable development, this expansion plan will help us meet the country’s growing energy needs fuelled by the rapid economic growth and urban expansion in recent years.”

He also added: “The opening of Al Bahya Service Station is a key step towards improving the operational efficiency of ADNOC Distribution service station network and expanding our geographical presence across the UAE to provide the best-in-class services to our customers. ADNOC Distribution will leverage its expertise to provide outstanding facilities and services to the residents of Al Bahya.”

The newly opened station offers a range of products and services round the clock including vehicle refuelling, LPG cylinders depot, a car care services, a mosque and ADNOC Oasis store that includes a bakery. In addition, an ATM machine and a fast food restaurant will open soon. The service station also provides automatic car wash and oil change services.
Exceerate Energy L.P. (Excelsor), in collaboration with Dubai Supply Authority (DUSUP), has completed the first commercial gas-up operation at DUSUP’s Jebel Ali LNG Import Terminal via Exceerate’s floating storage and regasification unit (FSRU) Explorer on August 31, 2016.

The FSRU gassed-up all five tanks of a 173,000 m3 LNG Carrier, in a 17-hour period. DUSUP’s ability to utilize the FSRU for these operations will allow LNG vessels departing regional dry docks avoid having to travel significant distances to perform this required step in the LNG cargo cycle, making Dubai a full-service LNG hub. A second similar gas-up operation was completed a few days later on another vessel.

This achievement not only demonstrates the enhanced capabilities of the newly upgraded Explorer, but it also illustrates the versatility of FSRU terminals in their ability to provide more than just regasification services. As part of Explorer’s recent upgrades, the vessel can now provide gas-up, cool-down, and loading services to LNG carriers. The FSRU was also upgraded to include an LNG bunker port to service small-scale LNG offtakers.

“We are pleased to support DUSUP in its ability to be a full-service LNG provider in the region,” stated Chief Executive Officer Rob Bryngelson. “With the added capabilities of Explorer, Jebel Ali LNG Terminal is more than just an import terminal. We are committed to offering safe, efficient, and customized solutions to our customers.”

Gas-up is one of the mandatory operations an LNG carrier must perform to make the cargo tanks ready to receive LNG cargoes after leaving the dry dock.

The terminal

In 2010, DUSUP completed the construction of the LNG import terminal in the port of Jebel Ali, which allows for the import of LNG via an FSRU. The terminal is located 35 kilometers southwest of the city of Dubai and provides natural gas for power generation and other industrial uses. To meet the increasing demand for natural gas in the Emirate, DUSUP entered into a long-term Time Charter Party Agreement with Excelsor in 2014 for a larger and more efficient FSRU to replace its existing regasification vessel.

The Explorer has 151,000 cubic meters of LNG storage capacity and is permanently moored alongside the jetty at Jebel Ali and can accommodate deliveries from ships as large as 263,000 cubic meters. DUSUP was founded under Decree N° 2 of 1992 with the sole authority to buy, store, distribute and sell natural gas within Dubai.
Lloyd's Register (LR), Hyundai Heavy Industries (HHI) and Hyundai Mipo Dockyard (HMD) have signed a joint development project (JDP) to produce a ship-to-ship LNG bunkering compatibility study. This will comprehensively review the design requirements between 6.6K LNG bunkering ships and 14K TEU LNG-fuelled container ships with the goal of verifying safe ship-to-ship LNG bunkering.

The study aims to help all stakeholders with interest in LNG as fuel to envisage a clear picture of possible options for LNG supply infrastructure. It follows LR's previous work with LNG-fuelled ship projects with HHI and LNG bunkering ships with HMD.

There is no existing standards or guidelines that cover the design and procedure for safe ship-to-ship LNG bunkering. However, this method of bunkering is preferable for many port authorities for safe and effective port operation and also preferable for ship operators due to cost-effective convenience.

The main objective of the JDP is to investigate the practicability of the LNG supply model by ship-to-ship between the typical size of 6.6K LNG bunkering ships and ultra-large container ships (ULCS). These designs have been reviewed and developed based on the LNG-fuelled system, and accordingly, the study will evaluate the right direction for LNG supply infrastructure.

LR has already developed a checklist for the design of LNG bunkering vessels and LNG receiving vessels for this JDP that summarises the risks related to ship-to-ship LNG bunkering, and also suggests design aspects which are not covered by legislation but are useful in understanding the characteristics of LNG-fuelled/LNG bunkering ships at the design stage.

This checklist provides both HHI and HMD with a chance to comprehensively review their design by, not only mandatory rules requirements, but also the prospective guidelines in order to identify the scope for further improvements in their design in line with their ships’ operating profiles.

Jin-Tae Lee, Ph.D, LR’s Korea Chief Representative & Marine Manager, who is a pro-active leader and supporter of technical innovation for joint success of the shipping and shipbuilding industries said: “Following recent developments in major ports towards a cleaner shipping industry, stakeholders will show interest in the advantages of LNG as fuel. However, the uncertainty associated with LNG supply infrastructure is still an influential factor in determining the profitability of a LNG-fuelled vessel. Stakeholders need to have a clear understanding of the benefits and challenges. Our Busan Technical Support Office, led by Vincent Rees, is fully prepared to assist our clients in LNG related projects from the concept design phase to the verification phase, which will be tailored to meet the individual clients’ needs.”

Chang-hyun Yoon, EVP of HMD Initial Planning Division added: “After having developed LNG bunkering ships with LR, we are expecting to comprehensively review our design in order to identify the key points for further improvements suited for the clients’ interests and demands through this JDP, thus trying to mitigate or minimise any potential issues which the operators can encounter during real operational situations.”

Byeong-Rok Lee, Senior Vice President, Head of Initial Design Office, HHI, commented: “As we take a profound interest in developing the design for LNG-fuelled ships with workability and functionality which is best suited for actual operational situation, we expect that these studies will help mature the design for LNG-fuelled ULCS.”

LR, HHI and HMD plan to expand the study for other ship types, including VLCC and Suezmax, following the completion of ULCS study.
Gazprom and Mitsui team up on LNG bunkering development in Asia-Pacific region

A working meeting between Alexey Miller, Chairman of the Gazprom Management Committee, and Masami Iijima, Representative Director and Chairman of the Board of Directors of Mitsui & Co., Ltd., took place at the Eastern Economic Forum 2016 in Vladivostok, in the province of Primorsky Krai.

The parties discussed the ongoing and future cooperation, focusing, among other things, on LNG production within the Sakhalin II project and on the increase in its output with the construction of the third production train of the LNG plant.

In the course of the meeting, Miller and Iijima signed a Memorandum of Understanding. The document reflects the parties’ intention to cooperate in feasibility and marketing studies with regard to the bunkering of marine vessels with LNG in Russia’s Far East and the Asia-Pacific region.

“Gazprom and Mitsui have successfully cooperated on the Sakhalin II project. Now we have an excellent opportunity to partner in a new business area – small-scale LNG. Joint efforts in the bunkering industry will help our companies diversify our businesses and strengthen our positions in the dynamic Asian market,” said Miller.
LNG fuel-cell vehicles will be tested in Hong Kong

LNG-powered fuel cells, not batteries, could be the future of electric vehicles in Hong Kong, according to a German-based Silicon Valley Kraftwerk start-up, which is eyeing the city as one of its first test markets. The company claims the LNG fuel-cell technology it has developed will offer a cleaner and more efficient alternative to lithium-ion batteries.

“Lithium ion batteries in the electric mobility concept are just not the right long-term solution. The three main problems are pricing, weight and energy density,” Kraftwerk co-founder Martin Pentenrieder said.

Fuel cell technology in cars is not new. Several car manufacturers such as Toyota and Hyundai have made recent efforts to mainstream hydrogen fuel cell road mobility. But costs remain high and the number of hydrogen filling stations low.

Pentenrieder, an ex-BMW employee, said LNG would work better than hydrogen in Hong Kong because the city already had a large infrastructure of filling stations, which could be capitalised on.

According to Kraftwerk’s design, LNG is injected through a fuel cell stack. A chemical reaction converts the liquid gas into electricity, which drives the vehicles power train. Like an electric vehicle, it emits no tailpipe emissions.

The design requires an electric vehicle to have both a tank for LNG and a separate fuel cell rack. However, Pentenrieder claims the entire system will be just one-third the weight and cost of a lithium-ion battery, with a well-to-wheel efficiency ratio of at least 45%. This means an LNG fuel cell car will require a refill after 3,200km.

“Electric cars powered by [grid power] can be very polluting. Also, where does the lithium ion battery come from? How much energy do you need to get lithium ions into your battery? And also, what do you do about recycling? There are no [viable] recycling solutions yet,” Pentenrieder said.

He said several large carmakers had expressed interest in the technology. The start-up has been admitted to an accelerator programme under Infiniti Motors with support from venture capital firm Nest.

Recognising the problem of deteriorated batteries, the Environmental Protection Department recently launched a competition to find innovative and practical ideas for retired lithium-ion batteries, as the number of electric vehicles on the city’s roads continues to grow. Pentenrieder said the technology could help solve the problem of battery-powered electric cars being fuelled by polluting grids and the lack of feasible recycling solutions for lithium ion batteries.
A G&P (Atlantic, Gulf and Pacific Company), a developer of infrastructure solutions for energy, natural resources and other industrial companies, has announced a major investment in GAS Entec, a pioneering, Korea-based engineering and design firm dedicated to small- and mid-scale LNG applications.

Together, AG&P and GAS Entec provide a suite of onshore and floating products for the distribution and use of LNG, such as LNG storage, regasification, LNG fuel bunkering, LNG-fueled power solutions, next-generation mooring structures and cold storage applications.

Founded by C.H. Kwak and S.R. Choi, long-time partners and innovators in the LNG application field, GAS Entec boasts successful case studies in the use of LNG. The company has designed and built a Floating Regasification Unit (FRU) operating successfully in Bali, Indonesia. In addition, GAS Entec engineered critical systems in the first LNG bunker vessel ever built in North America that will serve the port of Jacksonville, Florida.

AG&P’s Chairman, Jose P Leviste (Jr.), said, “The dramatically lower cost of LNG, coupled with the advent of new, affordable technologies such as those developed by GAS Entec have fostered a revolution in LNG applications. No longer is LNG-fuelled power the exclusive domain of the largest utilities. It is also available to a generation of innovative developers, power companies, ship owners, fishing fleets and others in a way that LNG has not been before. We are seeing the democratization of LNG. Therefore, this equity partnership between AG&P and GAS Entec will contribute strongly to pushing the boundaries of this new, revolutionary industry.”

Leviste continued: “Built in AG&P’s modern manufacturing facilities or locally at shipyards throughout the world, the standardized and tailored products that AG&P and GAS Entec develop are available quickly and affordably. We are very excited to bring together AG&P’s construction, operations and maintenance expertise with the experience and great brain trust that exists within GAS Entec.”

Kwak Chong-Ho, CEO of GAS Entec said, “We are privileged to join forces with AG&P. Together, we will deliver the full design, engineering, construction and
assembly, including the integration of sub-components such as cargo handling and control systems for various small- and mid-scale LNG vessels. Operating as an integrated, one-stop-shop, we will bridge the critical gap in LNG distribution and its applications globally. We remain an engineering company that can work with any customer, but the partnership with AG&P allows certainty, speed and commercially reasonable terms for our customers.”

Albert Altura, President, AG&P, said: “With GAS Entec, AG&P has built a world-leading practice focused on the use of LNG for power, fuel bunkering and industrial applications, such as cold storage. We see the archipelagos of the Philippines and Indonesia as prime candidates for a wholesale switch from coal as a fuel for power to LNG, particularly as the landed cost of LNG is now roughly one-half of what it was just a few years ago. LNG is a source of clean power and provides a compelling alternative to existing coal-fired power plants.

Altura continued: “In addition to providing a vital diversification of fuel supply, LNG also can feed small power units that are appropriate for various islands and communities, from 5MW upward to traditionally-sized plants. As a Filipino, it is so inspiring for me that a Philippines company has managed to bring together such talent from around the world, create outstanding partnerships, as we have done with GAS Entec, and offer cutting-edge LNG products and solutions to our domestic and global customers, floating and onshore.”
Korean public and private sectors join to promote hydrogen mobility

The Ministry of Trade, Industry and Energy (MOTIE) announced that it held a launch event for the Hydrogen Fusion Alliance, a consultative body of the public and private sectors, at The Plaza Hotel in Sogong-dong, Seoul, on August 24.

The alliance is comprised of the MOTIE, Ministry of Environment and Ministry of Land, Infrastructure, and Transport, the local governments of Ulsan, Gwangju and South Chungcheong Province, makers of hydrogen powered cars and their parts, like Hyundai Motor Co., hydrogen producers and suppliers, including Deokyang Co., hydrogen fuelling station installers, such as EM Solution Co., energy companies, including the state-run Korea Gas Corp. and learned societies like the Korean Hydrogen and New Energy Society.

The Hydrogen Fusion Alliance decided to increase the number of hydrogen powered cars and hydrogen fuelling stations throughout the country on the same day. It will also operate a task force team to popularize hydrogen energy and hydrogen fuel cell electric vehicles (FCEVs), establish companies which install and operate hydrogen fuelling stations, foster other hydrogen car-related business and seek international cooperation. In addition, the alliance plans to set up special purpose companies in order to install and operate hydrogen charging stations.

Major developed countries, including the U.S., the European Union and Japan, are also promoting the distribution of hydrogen powered cars and their utilities.

Hyundai will pilot fuel-cell taxi project

South Korea’s Hyundai Motor Co. announced it will introduce hydrogen-powered taxis in Ulsan, South Gyeongsang, and fuel cell car-sharing service in Gwangju, South Jeolla, in November as part of a pilot project aimed to promote and popularize environmental-friendly vehicles in the industry.

Hydrogen-powered cars are considered as next-generation vehicles that do not discharge pollutants such as fine dust. Hyundai Motor introduced its first fuel cell electric vehicle for the Tucson sport utility vehicle in 2013 with a driving range of 415 kilometers on a single charge that takes about 3 minutes. Unlike electric vehicles that use electric power stored in a battery as energy, hydrogen electric vehicles are able to produce energy using their own fuel cells.

Hyundai Motor’s latest pilot project is aimed at advancing the era of hydrogen-powered vehicles by promoting them via taxis that are common means of transportation in the country and also car-sharing service that has been rapidly attracting users. Once the Korea’s leading automaker concludes that the market for fuel cell vehicles has the potential to grow, it would expedite the establishment of related infrastructure nationwide.

As part of the first stage of the pilot project, Hyundai Motor plans to introduce 10 Tucson fuel cell model taxis in Ulsan by November and an additional five each in Ulsan and Gwangju by the first half of 2017. In the second phase of the project, the company aims to expand target regions in the country.

Hyundai Motor expects the pilot project to pick up speed in the first half of 2018 when it unveils its new fuel cell electric vehicle model in the market. The carmaker plans to introduce 100 hydrogen-powered taxis in five regions - 20 each - with established infrastructure for vehicle charging.

According to Hyundai Motor, taxi operators in each region will be in charge of maintenance and operation of fuel cell taxis, while the automaker of car will supports vehicle purchases and aftersales service. When it comes to the fuel cell car-sharing service that will be introduced in November in Gwangju, J’car, a local startup nurtured by Gwangju Creative Economy Innovation Center, will operate 30 vehicles - 15 hydrogen-powered electric vehicles and 15 electric vehicles. Cost for buying the vehicles will be covered jointly by Hyundai Venture Investment Corp. invested by Hyundai Motor Group that manages hydrogen funds and L&S Venture Capital that manages business funds for new technologies. Hyundai Motor will be responsible for aftersales service.

J’car plans to expand the car-sharing service in the first half of 2018 when Hyundai Motor unveils its new hydrogen fuel cell model. It aims to manage 160 vehicles in 2018 for the car-sharing service and 300 in 2020 by expanding the service to other South Jeolla regions in addition to Gwangju.
Kawasaki Heavy Industries has developed a ship fuel tank that can store up to five times more liquefied natural gas than the existing model. The adjustable box-shaped tank, which stores gas that has been liquefied and cooled at minus 162°C, can carry anywhere from 2,000 cu. meters to 10,000 cu. meters of the fuel. Dividers inside the tank boost resistance to turbulence.

The Japanese company will spend a year commercialising the product, with the aim of supplying containerships or car-carrying ships used in long-distance shipping.

Currently, tanks on LNG-fuelled ships are barrel-shaped and most hold less than 2,000 cu. meters.

International regulations on emissions of sulphur oxides, carbon dioxide and nitrogen oxides are becoming tighter. As a result, Kawasaki Heavy expects demand to increase for vessels powered by LNG, which has a smaller environmental impact.
Ballard Power Systems announced that it has signed a Distribution Agreement with Toyota Tsusho Corporation (TTC), a member Company of the Toyota Group. Under the agreement, TTC will act as a distributor of Ballard-powered fuel cell products in Japan. The initial term of the agreement runs to December 31, 2020.

Randy MacEwen, Ballard President and CEO said, “This agreement with Toyota Tsusho Corporation represents an exciting development for Ballard and important progress in the execution of our strategy in Japan. Toyota Tsusho is a large-scale player in Japan and around the globe, with interests in diverse areas and access to the tremendous network of Toyota Group Companies across a wide range of end-markets.”

As the Toyota Group’s sole general trading company – and one of the largest trading companies in Japan - Toyota Tsusho Corporation generated sales of 8,170 billion yen (approximately US$76.3 billion) in its latest fiscal year, ended March 2016.

TTC promotes the development of new business from a global perspective through its focus on Mobility, Life & Community and Resources & Environment. Toyota Tsusho Corporation’s operations span seven divisions: Metals; Global Parts & Logistics; Automotive; Machinery, Energy & Projects; Chemicals & Electronics; Food & Agribusiness; Consumer Products & Services. Each TTC division maintains highly specialized expertise and also combines know-how and capabilities with other divisions to generate synergy and create new value.

Japan’s Prime Minister Shinzo Abe has referred to hydrogen as an ‘energy of the future’ and the Japanese Government plans to spend more than $100 million on development of hydrogen infrastructure and various other hydrogen initiatives over the next 5-years.

Yuici Oi, TTC Chief Division Officer Global Parts and Logistics Division said, “We envision a number of interesting potential applications for Ballard fuel cell products including material handling, heavy-duty motive, continuous power and backup power in addition to powering a range of vehicles. The scope of our business interests offers a range of promising opportunities for hydrogen fuel cell technology.”

Ballard plans to deploy an ex-patriate sales person in Japan to work with TTC on the execution of a joint sales plan.
Sweden’s first LNG bunkering operation takes place in Gothenburg

M/T Ternsund, operated by the Swedish Donsö-based company Tärntank Ship Management AB, has bunkered natural gas at the Port of Gothenburg, and this is the first time ever in Sweden that a tanker bunkers this substantially cleaner marine fuel. Bunkering took place at a protected location just off the island of Fotö at the entrance to the port. The ship bunkered LNG from the Dutch bunkering vessel Coral Energy. The gas comes from the North Sea and has been supplied by the gas company Skangas.

“We have worked resolutely for a long time to create a situation where a ship could bunker LNG in Gothenburg. We have now managed to achieve our ambition and we are extremely pleased with the outcome,” said Jill Söderwall, Vice President and head of commercial operations at the Energy Port in Gothenburg.

Claes Möller, Fleet Manager at Tärntank Ship Management AB, commented: “This marks a new starting point for us. It heralds the beginning of a new era of more modern and considerably cleaner shipping. By opting for LNG, we will more than meet present and future environmental requirements. I’m proud that we are at the forefront in promoting greener transport.”

M/T Ternsund may be the first, but there will soon be several ships looking to bunker LNG on a regular basis at the Port of Gothenburg. Around 10 newly built LNG-powered vessels are on their way from the shipyards. To induce more operators to switch to LNG, the Port of Gothenburg has introduced a substantial discount on the port charge. M/T Ternsund will be the first ship to qualify for the maximum discount - 30%.

Source: Port of Gothenburg
Canberra will roll out first hydrogen vehicles in Australia’s history

The ACT (Australian Capital Territory) Government has announced a landmark project which includes Australia’s first-ever order for hydrogen-powered cars. Hyundai Motor Company Australia will provide 20 next-generation vehicles to the government in 2018, as a part of the Renewable Transport Fuels Test Berth in Canberra. Servicing and maintenance is included in the package.

The $23 million Test Berth project, delivered by Neoen, Megawatt Capital and Siemens, was made possible through the Hornsdale Windfarm Stage 3 contract with the ACT Government. The Renewable Transport Fuels Test Berth features a state-of-the-art Siemens Silyzer System hydrogen refueller, which at full capacity will be capable of providing fuel-grade hydrogen H2gas for over 1000 zero-emissions fuel cell vehicles travelling an average of 14,000km a year - and it does so without using any fossil fuels.

The hydrogen cars supplied by Hyundai will be next-generation fuel cell vehicles. This advanced zero-emissions car, due for launch in 2018, will replace the current ix35 Fuel Cell, the world’s first mass-produced hydrogen-powered vehicle. Hyundai Motor Company Australia was the first car company in Australia to fully import a hydrogen-powered vehicle into the country – an ix35 Fuel Cell in 2015 - and first to install a hydrogen refueller for light vehicles in Australia.

“Hyundai’s leadership in hydrogen has been rewarded with a contract to supply 20 of our next-generation hydrogen fuel cell vehicles to the ACT Government,” said Hyundai Motor Company Australia CEO, Charlie Kim. “We commend the vision and ambition of everyone responsible for the Renewable Transport Fuels Test Berth and Hornsdale Wind Farm Stage 3. We hope this brilliant project inspires others to see the potential of hydrogen as a future fuel for our cars.”

Source: Hyundai Australia

U.S. Department of Transportation helps deploy more CNG buses

The U.S. Department of Transportation’s Federal Transit Administration (FTA) announced the selections for its Bus and Bus Facilities Grant Program that will help provide more modern, reliable bus service for transit riders across the country. 61 projects in 41 states, the Virgin Islands, and Indian Country will receive a share of nearly $211 million to replace, rehabilitate, and purchase transit buses and related equipment, and construct bus-related facilities.

The projects selected to receive 2016 Bus Program funding include: the Mass Transportation Authority in Flint, Michigan, will receive $12.8 million for the purchase of CNG buses and a workforce development training program for mechanics and bus drivers; the Birmingham-Jefferson County Transit Authority, Alabama, will receive $405,000 to purchase a new CNG bus for service in the Birmingham; the Central Arkansas Transit Authority in Little Rock will receive $1,653,498 to purchase CNG buses to replace vehicles that have met their useful life; the Los Angeles County Metropolitan Transportation Authority (LACMTA), California, will receive $10,500,000 for the replacement of buses that have met their useful life with CNG buses to operate in the South Bay LA area; the Hillsborough Area Regional Transit Authority (HART), Florida, will receive $4,273,771 to purchase CNG buses to replace diesel buses that have reached the end of their useful life; the Rock Island County Metropolitan Mass Transit District (Metrolink), Illinois, will receive $391,000 to replace diesel buses that have exceeded their useful life with CNG buses; the Transit Authority of the City of Omaha (Metro), Nebraska, will receive $2,424,240 to purchase new CNG buses and partner with local community and workforce development centres to integrate public transit into the local workforce development experience.

“The Obama Administration is committed to improving transportation options that connect people in rural and urban areas across the country to opportunities,” said U.S. Transportation Secretary Anthony Foxx. “These grants will improve mobility for thousands of transit riders who depend on bus service every day, expanding access to employment, education, healthcare, and other important services in their communities.”

Source: Federal Transit Administration
Natural gas car covers
Finland from south to north without refuelling

The road test recently conducted by Gasum showed that a natural gas vehicle can be driven on one fill-up for almost 1,300 km - the same distance as the length of Finland end to end. Gasum has now launched a challenge for people to guess whereabouts in Finland the car stopped in the road test. Interest in alternative fuels is on the increase in Finland, but many consumers are still unfamiliar with natural gas and biogas as vehicle fuels.

The road test took the vehicle almost 1,300 km on just one fill-up, a driving range considerably longer than gasoline-fuelled vehicles. This impressive range is based on the natural gas vehicle also having a gasoline tank in addition to the CNG tank. If the CNG runs out, the car automatically switches to gasoline.

A common misconception relating to natural gas vehicle use is that CNG filling stations are few and far between in Finland, which is thought to pose challenges for driving in areas outside the Helsinki region in particular. However, Gasum is strongly committed to the development of natural gas vehicles, and one part of this is the construction of around 35 new filling stations over the coming years.

“Our road test served as excellent proof of the benefits of NGVs. Their driving range is bigger than that of normal cars and driving on natural gas is getting easier all the time thanks to the growing filling station network,” said Jani Arala, Senior Manager, Sales, Biogas Business, from Gasum.

Source: Gasum

OEM natural gas powered trucks arrive in Trinidad and Tobago

The dealership Ansa Motors, traded as Diamond Motors, has introduced the Freightliner brand in Trinidad and Tobago in collaboration with international partner Daimler Latina. Powered by CNG, the vehicles were brought into market as part of ongoing efforts to move the transport sector away from diesel and gasoline based fuels to cleaner, cost-effective alternative.

“We have CNG Freightliner OEM trucks in tractor heads or rigids that we could put in any application, from cranes to flatbeds trays,” said Rishi Basdeo, general manager at Diamond Motors. “We have a range of clientele that it would be suitable for. So, we could start with the heavy industrial sector and work it all the way down to individual businessmen who want to
invest in a high quality unit with the government subsidies to support it."

With the current government initiatives, said Basdeo, there is a place for the new models which operate on a cleaner fuel. He noted the Government’s expression of interest to fleet owners to explore how the state could assist them in upgrading to either OEM CNG trucks or retro-fitting vehicles to facilitate CNG use.

"With our option, local truck owners no longer have to consider only retro-fitting their vehicles. They can come straight to us, get these OEM units and they will get the full benefits of the warranties and the service and the after sales support that comes with it. Ultimately, there will be a threshold upon which customers will increase their rate of switching to CNG based on the price of fuel. Certainly, as the price of diesel or the price of gasoline goes up, the rate of switching will increase," he added.

The Freightliner Trucks’ Business Class M2 112 is available with LNG or CNG tanks, and the trucks and tractors are designed for high performance in a broad range of applications. Moreover, the Freightliner’s versatile, severe-duty truck, the 114SD NG, combines the performance features of the diesel-powered 114SD with the benefits of a Cummins Westport ISL G 8.9 natural gas engine. Customers can anticipate significant fuel cost savings, smart design and sturdy construction in a natural gas truck with set-back axles.

Source: NGC CNG Company Limited

**FedEx Freight announces CNG station and fleet in Oklahoma**

FedEx Freight, a wholly owned subsidiary of FedEx Corp. and a leading U.S. provider of LTL freight services, has purchased more than 100 CNG tractors and has installed a CNG fuelling station to serve the new CNG fleet at its Oklahoma City Service Center. FedEx Freight contracted with Clean Energy Fuels Corp to design, build and maintain the fuelling station. The site is estimated to dispense approximately 2.5 million gasoline gallon equivalents (GGEs) per year and will be showcased at a ribbon cutting ceremony October 11 by Oklahoma Gov. Mary Fallin.

The CNG station in Oklahoma City provides efficiency for fuelling the fleet through two different methods. The facility includes a four-lane “fast fill” station which closely replicates a diesel fuelling experience. Also on site is a “time fill” station which has six zones and 18 hoses. In time-fill applications, drivers connect their vehicles to an automated system in which the tractors are fuelled over an extended period of time, typically overnight.

“A fact we take very seriously at FedEx is that people want to do business with companies who invest in making the world a better place," said Michael Ducker, president and CEO of FedEx Freight. "Plus, it’s simply the right thing to do. And given that the state of Oklahoma has been so supportive of sustainable transportation solutions, we felt this was the perfect place to set a strong example within the LTL industry."

“The use of natural gas by FedEx Freight is a natural extension of our corporate-wide efforts to provide sustainable solutions that benefit the customers and communities we serve,” said Mitch Jackson, vice president of Environmental Affairs and Sustainability, FedEx Corp. “Across the FedEx enterprise, we continuously look for ways to maximize our efficiency while advancing our commitment to connect the world in responsible and resourceful ways.”

Source: FedEx Freight
The latest and most important news of the European NGV market

Finland opens first natural gas station for heavy vehicles

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## Asian NGV Communications

### Asian NGV Statistics

#### Worldwide NGV Statistics

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<tr>
<th>Country</th>
<th>Natural Gas Vehicles</th>
<th>Refueling stations</th>
<th>VRA</th>
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<th>Average consumption (accused report)</th>
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Notes: The column 'theoretical monthly consumption' is calculating total monthly consumption if cars consume 180, buses 3000, trucks 8000, and other vehicles 50Nm3 per month. There is, of course, a huge difference between different truck types. A 40 t truck may consume up to 80000 (not 8000) Nm3 per month.
Asian NGV statistics

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<th>Country</th>
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<th>МГ/HD Бусы</th>
<th>Others</th>
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Notes: The column ‘theoretical monthly consumption’ is calculating total monthly consumption if cars consume 100, buses 3000, trucks 8000, and other vehicles 50 Nm3 per month.

There is, of course, a huge difference between different truck types. A 44 ton truck may consume up to 8000 (not 8000) Nm3 per month.

Cities with CNG refuelling stations

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<td>United Arab Emirates</td>
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Total: 1,162
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