

# NGS' NG/LNG SNAPSHOT

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129 PARC Building, GAIL Training Institute  
Sector - 16A, NOIDA, UP - 201301

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## Cumbersome process may hit city gas licensing - Regulator expects a good response despite hurdles of numbers, area and parameters

Too many city gas distribution licences and too big licence areas on offer, along with some regulatory provisions on exclusivity of permits and bid parameters may discourage bidders in the ninth city gas licensing round currently underway, but the regulator expects a good response. The Petroleum and Natural Gas Regulatory Board (PNGRB), which is overseeing the licensing round, said the scale of the current auction or the size of licence areas are in line with the market needs, and the regulator expects healthy investor turnout, and is well prepared to enforce the licensing conditions during the auction and later. Executives at some potential bidders feel that PNGRB has made it harder for them to bid by not providing market assessment of the licensing areas, and not giving a specific tap-off point or designated transmission line for an area that may induce two bidders to make very different bids based on their assumptions on gas sources. "Until there is a diktat from the government to PSUs, it will be difficult to get bidders for all areas on offer," said a top executive at a city gas firm. Executive at another city gas company said some of the geographical areas are too big. "In some cases, almost three districts have been clubbed and you are required to take pipeline to every tehsil.

The licensee may face political pressure to take pipeline to villages. So it's no more city gas distribution, but village gas distribution. This will raise cost for us, make it unattractive." "We had an open house on this and some companies favoured bigger areas to justify their investment returns while other favoured smaller areas. We have tried to keep a balance," Sarraf said. He said his meetings with potential investors had given him a sense that each area would receive "multiple bids" and in some cases the number of bidders could be in double digits.

<https://economictimes.indiatimes.com/industry/energy/oil-gas/cumbersome-process-may-hit-city-gas-licensing/article-show/64726962.cms>

## Uber, GAIL Gas to promote CNG fleet

US-based cab aggregator Uber has tied up with GAIL Gas, the marketing arm of gas utility GAIL, to promote CNG (compressed natural gas)-fuelled fleet in various cities. The initiative is being launched with Bengaluru and will subsequently be extended across the country, including cities such as Hyderabad and Kolkata, both companies said in separate statements. As part of this partnership, GAIL Gas will open CNG stations and Uber will promote the adoption of the cleaner fuel in cars on its platform. GAIL Gas will provide free CNG kits to the first 500 cars joining the programme, capped at a maximum of Rs 10,000 per car (to be offered

over four months). Uber will provide a joining award of Rs 10,000 to the first 500 CNG vehicles driving with the platform. "Uber will create awareness among its driver partner community on the benefits of CNG through several channels. In order to promote cleaner fuel vehicles, GAIL Gas and Uber will also be leading conversations with OEMs, auto dealers and retrofitters," Uber said in a statement.

<https://timesofindia.indiatimes.com/business/india-business/uber-gail-gas-to-promote-cng-fleet/articleshow/64671046.cms>

## GAIL to set up 20 CNG Stations in Bengaluru

Public sector undertaking Gas Authority of India (GAIL), will be setting up 20 CNG retail stations across Bengaluru for refueling vehicles. To optimise uptake of CNG and improve accessibility to the fuel for city residents, GAIL Gas, a wholly-owned subsidiary of GAIL India, is also making CNG available through retail outlets of other oil marketing Companies. Overall, to cater to the demand and facilitate a strong ecosystem, 20 new CNG stations are expected to be operational by March 2019, according to the company. With an aim of providing a fillip to the development of a clean fuel ecosystem in Bengaluru, GAIL Gas, and Uber, the world's largest ridesharing company, on Wednesday entered into a partnership to promote the usage of CNG in the city. As part of the initiative, termed 'Hasiru Bengaluru' or 'Green Bengaluru', an MoU was signed between the two companies during the inauguration of a GAIL Gas CNG Station at Hardware Technology Park, near Bengaluru airport. As part of the agreement, GAIL Gas will provide free CNG to the first 500 cars joining under the programme, capped at a maximum of Rs 10,000 per car. GAIL Gas will be extending coupons to each of the participating Uber driver partners for Rs 2,500 per month for the first four months. Uber will provide a joining award of Rs 10,000 to the first 500 CNG vehicles driving with the platform. According to GAIL Gas CEO A K Jana, "Use of CNG can lead to monthly savings of up to Rs 15,000 for Uber drivers in Bengaluru."

<https://www.deccanherald.com/business/gail-set-20-cng-stations-bluru-676018.html>

## City gas' to reach half of country's population

Almost half of India's population will be under the coverage of 'city gas distribution' (CGD) once projects awarded for various geographical areas in the ongoing round of bidding are completed, Petroleum and Natural Gas Regulatory Board (PNGRB) chairperson D.K. Sarraf has said. "On offer in the present round of bidding are 86 geographical areas covering 174 districts spread over 22 States and Union Territories, covering 29% of India's population and 24% of its geographical area. This is a big leap considering that the geographical areas authorised so far only cover about 19% of the country's population and 11% of its area," Mr. Sarraf told the media after a roadshow held here. The PNGRB has so far conducted eight CGD bidding rounds over the past nine years resulting in the award of 56 geographical areas. As many as 91 geographical areas have been authorised by it so far, also counting 29 geographical areas that were in existence before the formation of the PNGRB and six government-mandated geographical areas. "After the award of the geographical areas under offer [in the present round], gas distribution would reach 286 districts (276 complete and 10 part) spread over 26 States/UTs, covering 49% of India's population and 35% area (sic)," mentioned a media note issued at the event. The existing geographical areas have 42 lakh domestic customers; 30 lakh CNG vehicles; 1,350 CNG stations; and 33,000 industrial and commercial customers.

<http://www.thehindu.com/news/national/kerala/city-gas-to-reach-half-of-countrys-population/article24256086.ece>

## Bengal Government takes first step to supply natural gas through pipelines

With the Centre's indifferent attitude in controlling the price of cooking gas cylinders, the Mamata Banerjee government has taken initiative to introduce supply of natural gas through pipelines. The Cabinet gave nod for the joint venture project of Greater Calcutta Gas Supply Corporation and Gas Authority of India Limited (GAIL). Firhad Hakim, the state Urban Development and Municipal Affairs minister, said: "The cost of cooking gas has gone up and it is causing inconvenience to the common people. In such a situation, the state government has decided to introduce the supply of natural gas through pipeline." Hakim said that the move will ensure easy supply of gas and that too at the right price. The Greater Calcutta Gas Supply Corporation Limited (GCGSC), which is a state government owned company, will be going for a joint venture with GAIL at a ratio of 74 and 26 respectively. It will ensure supply of natural gas through pipelines in households, hospitals and small industries, in the area under Kolkata Metropolitan Development Authority (KMDA). In many places, it will become available in the next two years, while it will take around 5 years to supply the same in the entire KMDA area. The total investment for the project is Rs 6,000 crore. There will be an initial investment of Rs 144 crore for the same. It may be mentioned that with its introduction, there will be "user-friendly, safe

and environment-friendly" supply of fuel. It will help in reducing pollution, as small industries where coal is still used as fuel, will be using natural gas.

<http://www.millenniumpost.in/kolkata/govt-takes-first-step-to-supply-natural-gas-through-pipelines-305506>

## Seven North Kerala districts to come under gas distribution network by 2019

With the extension of CGD to Kozhikode, Wayanad, Malappuram, Kannur, Kasargod, Palakkad and Thrissur, around 63 per cent of the state's population will get access to natural gas. The Petroleum and Natural Gas Regulatory Board (PNGRB) organised a roadshow in Kochi on Monday to initiate the City Gas Distribution (CGD) bidding round for distribution of piped natural gas in seven north Kerala districts. With the extension of CGD to Kozhikode, Wayanad, Malappuram, Kannur, Kasargod, Palakkad and Thrissur, around 63% of the state's population will get access to natural gas. Pipeline laying works for the CGD is in progress in Ernakulam district. Currently there are 91 CGD networks in India covering 19 per cent of the country's population. The PNGRB has initiated the ninth bidding round offering 86 geographical areas covering 174 districts covering 29 per cent of the population, PNGRB chairperson D K Sarraf told media persons. The current City Gas Distribution networks sell around 25 MMSCMD. After the award of new networks, gas distribution will cover 49% of the country's

population, he said. "The bid submission will end on July 10 and the areas will be awarded by October. We have identified 14 industrial units and 15 more will be covered by March 2019," said Sarraf. "The state government has been very proactive and the Chief Minister has nominated the Chief Secretary as the nodal officer for the project.

<http://www.newindianexpress.com/states/kerala/2018/jun/26/seven-north-kerala-districts-to-come-under-gas-distribution-network-by-2019-1833613.html>

## KSRTC to get more CNG buses

After a trial run of more than two months, the Kerala State Road Transport Corporation is all set to procure more CNG buses. A tender for 10 fully-built CNG buses of BSIV emission norms has been floated by the KSRTC. The KSRTC had begun conducting the trial run of the first CNG bus on March 22 in Kochi. The corporation has made a few changes in the tenders for CNG buses. The bus used for trial run had four cylinders, and a capacity to carry 60 passengers. The tender floated by the KSRTC specifies that the buses need to have six cylinders, which could increase the capacity to 90, including 30 standing passengers as well. With a single filling of the fuel tank, the bus can cover a minimum distance of 320km. The KSRTC is planning to operate in all kinds of routes of KSRTC, including in high-range areas.

<https://timesofindia.indiatimes.com/city/thiruvananthapuram/ksrtc-to-get-more-cng-buses/articleshow/64620919.cms>

## NATIONAL: NATURAL GAS/PIPELINES/COMPANY IN THE NEWS

### Government defers auction for 60 oil and gas fields by a month

The government has deferred the bidding for 60 oil and gas fields being offered in the second round of bidding for discovered small field (DSF) by a month. DSF-II was supposed to be launched around mid-June, but it won't happen before July, a senior government official said. He, however, did not give a reason for delaying the bid round. The government had in 2016 brought a new DSF policy, offering "idle" small discovered fields of state-owned Oil and Natural Gas Corp. (ONGC) and Oil India Ltd (OIL) in an auction on liberalised terms including marketing and pricing freedom and lower taxes. The union cabinet had in February approved the second round of DSF auctions, under which the government is offering a total of 60 discovered small fields with an estimated 194.65 million tonnes of oil equivalent (MMtoe). These discoveries have been clubbed into 26 contract areas spread over 8 sedimentary basins, he said. "DSF-II will be launched soon." Besides, full marketing and pricing freedom has been guaranteed and royalty rates have been cut, he said. Of the 60 fields which will be up for auctions, 22 fields belong to ONGC, five to OIL and 12 are relinquished discovered fields from the new exploration and licensing policy (NELP) blocks.

In DSF-I launched in May 2016, 46 contract areas consisting of 67 discovered fields spread across nine sedimentary basins were auctioned. The auctions attracted 134 e-bids for 34 contract areas of the 46 offered. Later, 22 companies were shortlisted for 31 contract areas of which 15 companies were new entrants with no prior experience in the sector. The official said 21 fields which did not receive any investor interest in DSF-I will also be part of the second DSF round.

<https://www.livemint.com/Industry/gD4uR9LU0ti1894TwrftYL/Government-defers-auction-for-60-oil-and-gas-fields-by-a-mon.html>

### AP plans pollution-free energy solutions in Amaravati

The state government is formulating a plan on total energy solutions to meet the energy requirements of Amaravati capital city up to 2025 and 2050 based on world-class practices. Taking the energy requirements of various sectors institutional, domestic, automotive and industrial--the government is focusing on various eco-friendly technological solutions for the greenfield capital city. The government prefers the technologies which reduce carbon monoxide, carbon dioxide and hydrocarbons significantly as it promised one of the three best world-class capital cities. The government is considering various technologies, including waste to energy technology for green electricity, bio-CNG for automotive needs, renewable energy for household and other purposes, energy storage batteries for e-rikshaw, cars and industrial needs, LNG for automotive and domestic needs. In a recent meeting held with Chief Minister N Chandrababu Naidu, Indian Oil Corporation (IOC) submitted its vision on total energy solutions for Amaravati. Sources said the IOC, in its plan submitted to the government, proposed 37 energy stations (diesel) for capital region under three phases taking the energy requirements till 2050 into consideration. It has reportedly estimated that Rs 674 crore funds need to be invested

to set up 37 energy stations. The AP Capital Region Development Authority (APCRDA) has also estimated the sector-wise demand for natural gas in Amaravati which could be 0.15 MMSCMD by 2025 and 1.94 MMSCMD by 2050. The CRDA prepared a plan mentioning available options on natural gas supply to Amaravati. The APCRDA has also envisaged a plan on city gas distribution (CGD) project with a total investment of Rs 1,721 crore. Gas will be supplied through pipelines across the Amaravati capital city. The APCRDA must provide land to IOC for CGD station and other infrastructure. It also planned hydrogen blended CNG stations for automobiles. For electric power requirements, the APCRDA prepared a plan on solar power system taking the energy requirements into consideration till 2050. The power demand for Amaravati is estimated as 2,706 MW by 2050 and it also planned to produce 1,816 MW of solar power through rooftop of government and other buildings. Sources said the IOC proposed to set up a solar plant of 100 MW as part of its MoU with APCRDA. It has proposed to produce 64 MW of solar power through ground mounted solar plant and another 36 MW through roof-top solar production on government buildings.

<http://www.thehansindia.com/posts/index/Andhra-Pradesh/2018-06-18/AP-plans-pollution-free-energy-solutions-in-Amaravati/390013>

### OIL makes gas discovery in Andhra Pradesh's Krishna Godvari basin

Oil India Ltd, the nation's second biggest oil explorer, today said it has made a second natural gas discovery in an on-land block in Andhra Pradesh. Oil India Ltd, the nation's second biggest oil explorer, today said it has made a second natural gas discovery in an onland block in Andhra Pradesh. The discovery was made in Krishna Godvari basin block KG-ONN-2004/1, which OIL had won in sixth round of auction under New Exploration Licensing Policy, the company said in a statement. The discovery made at well Thanelanka-1 is the second find in the block, it said. "Earlier, a gas discovery was made at well Dangeru-1 in Andhra Pradesh in the block." The well Thanelanka-1 is the first high pressure-high temperature (HP-HT) well drilled by OIL and has encountered hydrocarbon bearing sands, the statement said, adding that on testing the HP-HT zone produced 1300 standard cubic meters per day of gas. "Presently, the well is under further testing," the company said without giving a reserve estimate.

<https://www.financialexpress.com/industry/oil-makes-gas-discovery-in-andhra-pradeshs-krishna-godvari-basin/1219847/>

## TECHNOLOGICAL DEVELOPMENT FOR CLEANER ENVIRONMENT/BIO-METHANE

### Bio-CNG plants in rural India soon: Pradhan

Union Minister for Petroleum and Natural Gas Dharmendra Pradhan announced plans to set up bio-Compressed Natural Gas (CNG) plants in India. He made this comment after visiting a bio-CNG plant in Stuttgart, Germany, where he was briefed by officials on how agricultural waste can be converted into energy. Pradhan told ANI, "Materials like straw and dung are considered waste in India. This can be used to produce energy. Such plants can be made in India. We are understanding the business model and technology. If it's successful, we can set up bio-CNG plants in all villages of India." Explaining the working of a bio-CNG plant, Pradhan said, "The farmers first collect the agricultural waste. It is then processed and gives rise to raw gas. Then, it is converted into electricity. After certain mechanical and chemical processes, it gives rise to pure CNG, which can also be used in energy farming." Indian Oil Corporation (IOCL) Chairman Sanjeev Singh later said that MOUs have been signed in the energy sector with business partners. The Union Minister also pitched for "responsible pricing" which balances the interests of both producer and consumer.

[https://www.business-standard.com/article/news-ani/bio-cng-plants-in-rural-india-soon-pradhan-118062100598\\_1.html](https://www.business-standard.com/article/news-ani/bio-cng-plants-in-rural-india-soon-pradhan-118062100598_1.html)

## World's fastest growing energy market for the next two decades

India is the third largest energy consumer in the world and accounted for ~5.5% of the global primary energy consumption in 2016. India accounted for 11% of the global coal consumption in 2016; for the second consecutive year, India remained the second largest coal consumer in the world. The country experienced its largest increase in oil consumption, increasing by 325 Kb/d in 2016; further, India was the third largest oil consumer in the world (4.6% of the global total). While energy use has doubled since 2000, the energy consumption per capita is only around one-third of the global average and ~240 million people still have no access to electricity, indicating significant growth opportunities. Increasing consumption of oil, coal, gas, and renewables in power far outweighs the declines in hydro and nuclear. Oil consumption in 2016 increased by 325 Kb/d thereby increasing its share in India's primary energy consumption for the third successive year to 29%, a record high. Coal remains the dominant fuel, accounting for ~60 per cent of India's energy consumption. India's gas consumption rose in 2016 after three consecutive years of decline. Renewables currently stands at by 29.2%, its largest increment ever. India is now the 7th largest renewable power generator in the world. India's crude oil imports rose to 4.8 Mbpd in 2016, the highest level ever. Natural gas imports rose from 21.4 BCM in 2015-16 to 24.7 BCM in 2016-17. Meanwhile, there has been a sharp growth in India's refining capacity and throughput, contributing 72% to the net growth in global refining capacity.

<http://www.mydigitalfc.com/deep-dive/india%E2%80%99s-energy-landscape>

## India to press for 'responsible pricing' at OPEC meet

Union Petroleum Minister Dharmendra Pradhan is set to press for 'responsible pricing' at a crucial meeting of oil producing nations set to be held in Vienna on June 22. With crude oil prices having risen steadily over the last year and India's current account balance beginning to show the strains of rising import costs, Union Petroleum Minister Dharmendra Pradhan is set to press for 'responsible pricing' at a crucial meeting of oil producing nations set to be held in Vienna on June 22. Pradhan will be India's representative at the Organisation of the Petroleum Exporting Countries (OPEC) meet, which will delib-

erate on whether to continue the production cuts decided by OPEC and other oil exporters in 2017. India is likely to leverage its position as one of the largest oil consumers in the world. Stating that the visit comes at a "crucial time when the global crude oil prices are at the highest since the peak of 2014", the government said, "India's engagement with OPEC is important as India sources about 82 per cent of crude oil, 75 per cent of natural gas and 97 per cent of LPG from OPEC member countries." Pradhan also pointed out that in official meetings with OPEC members, India has "told them that crude oil prices should be controlled, reasonable, responsible and should meet demand".

<http://www.newindianexpress.com/business/2018/jun/19/india-to-press-for-responsible-pricing-at-opec-meet-1830095.html>

## ONGC sells coal-bed methane at \$5.77-6.12 per million British thermal

Oil and Natural Gas Corp Ltd. has sold natural gas from three coal-bed methane blocks in Jharkhand for a price ranging between \$5.77 per MMBtu to \$6.12 per MMBtu. ONGC sold gas from its Bokaro CBM block to a private industry, HN Roy, for \$5.77 per MMBtu on a gross calorific value basis, sources with direct knowledge of the development said. State gas utility GAIL India Ltd. will buy gas found below coal-seams in the North Karanpura block at \$5.56 per MMBtu while private sector Positron Energy Pvt Ltd would offtake gas from Jharia CBM block at

\$6.12 per MMBtu. ONGC is to start production from the three blocks by next month with the peak volumes touching 3 million standard cubic meters per day. Sources said the company has already drilled six wells on Bokaro block and the seventh well was in progress. A total of 30 wells are planned to be drilled during 2018-19. Drilling in North Karanpur started this month and 30 wells are planned on the block before March 31, 2019, they said. The price realised by ONGC is less than the rate at which Essar Oil has sold its entire production of coal-seam gas or CBM from a West Bengal block to state-owned GAIL India Ltd.

GAIL in February bought 2.3 MMSCMD of coal-bed methane that Essar Oil and Gas Exploration and Production will produce from its Raniganj block in West Bengal for \$7.1 per MMBtu. The rate is more than double of the \$3.06 per MMBtu price set by the government for most of the domestically produced conventional natural gas. RIL's Sohagpur gas at today's oil price comes to \$7.15 per MMBtu on GCV basis. The formula used by RIL and Essar is the same at which Petronet LNG, a joint venture of public oil companies, whose chairman is the oil secretary, used to import long-term LNG from Qatar. Sources said gas from North Karanpura is due to flow from July but GAIL has sought an extension of gas offtake up to December to complete pipelines for evacuation. ONGC is, however, insisting that GAIL honour its commitment to lift gas from July by using truck-mounted cascades.

[Source: PTI/Indian Oil & Gas](http://www.pti.com/indian-oil-gas)

## India rethinks decision to split up gas utility GAIL

India is working on plans to enable gas utility GAIL to keep its marketing and pipeline operations separate without breaking up the company, India's oil minister said. The government had said in January that it wanted to split the company into two - one for laying pipelines and the other for marketing and petrochemicals - to encourage more transparency between the two operations. "My job is not to create more companies, my job is to create more accessibility through policy," Dharmendra Pradhan, India's oil minister said. Investors, private companies and consultants have said that GAIL's dominance in pipeline infrastructure across the country conflicts with its business of marketing and trading of natural gas. Pradhan said: "Gail must be seen to be transparent," adding that Gail was working on a model to keep its pipeline and marketing businesses independent of each other. "My job is to create more transparency and a neutral platform so that other companies can also utilise that infrastructure," Pradhan said. He did not give a reason for the government's change of position on splitting up the company, which was seen earlier as a move to raise money by selling its marketing arm to a state-owned oil refining and marketing company. The country's top two refiners Indian Oil Corp Ltd and Bharat Petroleum Corp Ltd had shown interest in integrating GAIL's marketing arm with their business. 'Unbundling' of GAIL was one of the three key steps towards creating a natural gas marketplace in India, the other two being forming a trading hub and open access to gas pipelines, the head of India's gas regulator D K Sarraf had told Reuters in April.

<https://energy.economictimes.indiatimes.com/news/oil-and-gas/india-rethinks-decision-to-split-up-gas-utility-gail/64787248>

## GAIL expects LNG prices to settle down as new projects start commissioning

As new LNG projects start commissioning, prices will settle down to normal level as supply increases, said BC Tripathi, Chairman & Managing Director, GAIL. India's state-owned natural gas utility, GAIL, has recently switched its focus to short-term and spot deals for the purchase of LNG to meet rising demand and hedge against price volatility. Speaking to CNBC-TV18, Tripathi said the company is not a beneficiary, when the prices are high for consumers as the increase is because of market moments based on supply-demand situations. However, the company is focusing on how to optimise the supply, and cut down the cost of procurement, shipping with various optimisation tools, so that prices are affordable to the consumers, Tripathi added. According to him, prices will remain at the current levels and expect to come down because of some global changes and increase in China's LNG demand. Tripathi said the pro-

posed hike in transmission tariffs is due to low capacity utilisation of the pipeline and any infrastructure projects cannot sustain longer if it's not given assured or reasonable rate of return. Discussions between government and Petroleum and Natural Gas Regulatory Board (PNGRB) is on and aim is to create a situation, where it balances for all the consumers and for the companies investing in the infrastructure, he said.

<https://www.cnbctv18.com/videos/energy/gail-expects-lng-prices-to-settle-down-as-new-projects-start-commissioning-187151.htm>

## LNG may fuel a boom in Gujarat's ports

Riding on a high growth trajectory, Gujarat's ports sector is set to undergo a major transformation with surging demand for imported liquefied natural gas (LNG) in the country. The growing need for energy across sectors mainly in the city gas distribution (CGD) and other consuming industries, has prompted a shift in the

pattern of cargo handling at Gujarat ports from dry bulk cargo to LNG. Known for its numero uno position in the LNG space with two operational LNG terminals with combined handling capacity of almost 20 MMTPA, Gujarat is aggressively ramping up its capacities with one more 5 MMTPA LNG terminal being set up by GSPC LNG Ltd — a joint venture between State-run Gujarat State Petroleum Corporation (GSPC) and Adani Group — at Mundra in Kutch. The State will be the first in the country to set up a floating regasification unit (FSRU) at Jafrabad in Amreli district by Swan Energy Ltd (SEL) in association with Exmar NV of Belgium. While the GSPC LNG terminal is likely to be commissioned soon, the FSRU for Jafrabad is currently under construction at Hyundai Heavy Industries (HHI)'s shipyard in South Korea. The unit is expected to be delivered by end-2019 and will become operational by early 2020.

<https://www.thehindubusinessline.com/economy/macro-economy/lng-may-fuel-a-boom-in-gujarats-ports/article24282201.ece>

## TECHNOLOGICAL DEVELOPMENT FOR CLEANER ENVIRONMENT/BIO-METHANE

### Solaris prepares next generation hydrogen bus

Solaris Bus & Coach has extended its range of environmentally friendly buses by debuting the Solaris Urbino 12 hydrogen, a new generation vehicle deriving power from a hydrogen fuel cell. The official premiere of the vehicle is slated for 2019. Solaris says adding this model is a response to growing interest of the European market in emission-free public transport vehicles. Energy needed to power the driveline of the bus will be obtained from hydrogen which will be processed in a fuel cell to electric power. Thanks to the technology used in the hydrogen buses, these will be able to cover a record-long distance on a single refuelling — over 350 km. The vehicle will be also fitted with one of Solaris' small High Power traction battery of 29.2 kWh which is to support the fuel cell when the demand for energy is biggest. The battery will be charged with hydrogen energy. The bus will be equipped with cutting-edge fuel cells of the latest generation, boasting a power of 60 kW. Composite hydrogen tanks will be stored on the bus roof, reducing their mass by about 20% compared to previous models. In order to optimally reduce energy use in the vehicle, it will feature a climate comfort system with a CO<sub>2</sub> heat pump; the system will harness waste heat from the fuel cell. This solution increases efficiency while significantly improving the driving range of the bus.

<http://www.ngvglobal.com/blog/solaris-prepares-next-generation-hydrogen-bus-0620>

### University of Birmingham presents UK's first operational hydrogen train

The Birmingham Centre for Rail Research and Education (BCRRE), the largest university-based centre for railway research in Europe, has unveiled the UK's first fully operating hydrogen train at Rail Live 2018, an annual event that brings the entire industry together to showcase rail expertise. The train, named 'Hydrogen Hero', has been completely designed and engineered in the UK, and is currently a scaled-down version using technology that is ready to be brought to market with BCRRE industry partners in the coming months. Transport currently accounts for around a quarter of the UK's greenhouse gas emissions and the Government has committed to reduce its carbon emissions by at least 80%, against 1990 levels, by 2050. In February 2018, Minister of State for Transport Jo Johnson called for diesel-only trains to be phased out as part of a new vision to decarbonize the railway by 2040. Hydrogen trains are expected to form a key part of the UK's plan to tackle climate change and to improve air quality, particularly in city centre stations such as Birmingham New Street which was recently found to suffer from very poor air quality at platform level. The development of this demonstration model brings the UK one step closer to seeing fully functioning hydrogen trains on the tracks within four years and helping to significantly reduce the railway's carbon emissions. Dr Stuart Hillmansen, Senior Lecturer in Railway Energy and Power Systems at BCRRE, said: "Hydrogen fuel cell technology is ready for the railway. With our 'Hydrogen Hero' train, we want to demonstrate that hydrogen is viable right now for use on the UK railway as a realistic alternative to diesel. At BCRRE we are actively innovating and developing practical, market-ready technologies that can transform the UK railway."

<http://www.ngvjournals.com/s1-news/c7-lng-h2-blends/university-of-birmingham-unveils-uks-first-operational-hydrogen-fueled-train/>

## US oil, gas industry emits 60% more methane than thought: Study

The climate impact of these leaks in 2015 was roughly the same as the climate impact of carbon dioxide emissions from all US coal-fired power plants operating in 2015, researchers found. The US oil and gas industry emits 13 MMT of the potent greenhouse gas methane from its operations each year, 60% more than estimated, scientists say. A study, published in the journal *Science*, found that most of the emissions came from leaks, equipment malfunctions and other “abnormal” operating conditions. The climate impact of these leaks in 2015 was roughly the same as the climate impact of carbon dioxide emissions from all US coal-fired power plants operating in 2015, researchers found. Researchers including those from University of Colorado Boulder and University of Texas Austin in the US assessed measurements made at more than 400 well pads in six oil and gas production basins and scores of midstream facilities; measurements from valves, tanks and other equipment; and aerial surveys covering large swaths of the US oil and gas infrastructure. The new study estimates total US emissions at 2.3% of production, enough to erode the potential climate benefit of switching from coal to natural gas over the past 20 years. The methane lost to leakage is worth an estimated USD 2 billion, according to the Environmental Defense Fund, enough to heat 10 million homes in the US. The assessment does suggest that repairing leaks and addressing other conditions that result in the accidental release of salvable methane could be effective. “Natural gas emissions can, in fact, be significantly reduced if properly monitored,” said Colm Sweeney, an atmospheric scientist in NOAA’s Global Monitoring Division.

<https://www.moneycontrol.com/news/business/economy/us-oil-gas-industry-emits-60-more-methane-than-thought-study-2627401.html>

## Coal is being squeezed out of power industry by cheap renewables

Coal will be increasingly squeezed out of the power generation market over the next three decades as the cost of renewables plunges and technology improves the flexibility of grids globally. That’s the conclusion of a report by Bloomberg New Energy Finance, which estimated some

\$11.5 trillion of investment will go into electricity generation between now and 2050. Of that, 85%, or \$9.8 billion, will go into wind, solar and other zero-emissions technologies such as hydro and nuclear, the London-based researcher said. Better batteries, which allow grid managers to store power for times when it’s neither breezy nor sunny, will allow utilities to take advantage of plunging costs for solar panels and wind turbines. The ability of natural gas plants to work at a few minutes notice means the fuel will become the choice for most utilities wanting guaranteed generation capacity. “Coal emerges as the biggest loser in the long run,” said Elena Giannakopoulou, head of energy economics at BNEF. “Beaten on cost by wind and PV for bulk electricity generation, and by batteries and gas for flexibility, the future electricity system will reorganize around cheap renewables.” Gas will keep much of its market share, BNEF says. The nature of plants being built in the future will shift to peaker units that utilities can switch on and off quickly and away from the baseload plants that tend to operate around the clock. The chart below shows BNEF’s forecast that utilities will burn much less coal over time. The

decline of coal won’t be enough to dramatically alter the picture for a gradual increase in global temperatures in excess of the threshold of 2 degrees Celsius since pre-industrial times that has become the United Nations climate target. “Even if we decommission all the world’s coal plants by 2035, the power sector would still be tracking above a climate-safe trajectory, burning too much unabated gas,” said Matthias Kimmel, energy economist at BNEF. Even without tighter environmental rules, renewables will be increasingly attractive to utilities if only because of their falling costs. Building wind and solar farms will become much cheaper by 2040, according to the BNEF estimates, while traditional nuclear and coal projects become more costly. With solar energy, the amount of capacity being installed is rising as overall capital costs decline, BNEF estimates. The chart below shows investment in photovoltaics peaking in the 2030s and declining in the decade after, while the capacity that investment buys remains strong.

<https://www.hellenicshippingnews.com/coal-is-being-squeezed-out-of-power-industry-by-cheap-renewables/>

## U.S. and Russia to dominate world’s oil & gas pipeline spending

The U.S. shale boom and the massive Russian expansion of natural gas pipelines will make the United States and Russia the dominant spenders on oil, petroleum products, and natural gas pipelines through 2022, data and analytics company GlobalData says in a new report. The other big spenders between 2018 and 2022 will be Canada, China, and Nigeria, according to the analytics firm. The U.S. will be leading the capital expenditure (capex) on oil and gas pipelines, with an estimated US\$88.4 billion on new pipelines by 2022, while Russia is seen spending US\$78.8 billion. In the United States, spending on natural gas pipelines will account for around 40% of the total planned pipelines by 2022, with crude oil and natural gas liquids (NGL) expected to have 31% and 24% shares of expenditure, respectively. In Russia, the spending is mostly focused on natural gas pipelines, which will account for 88 percent of the planned pipelines expected to come online by 2022. Petroleum products pipelines and oil pipelines are the next major planned pipelines with capex share of 7% and 4%, respectively. Russia is further expanding its massive natural gas pipelines network for exports. The country is building pipelines to transport natural gas from its production centres to demand centres such as China, Japan, India and Europe,” Tejomoortula noted. While U.S. spending on pipelines will surge through 2022, currently, the fastest-growing oil producing region in the United States, the Permian, is nearing the limits of its pipeline takeaway capacity and some producers may be forced to shut in wells within months, according to the chairman of one of the biggest U.S. shale producers, Pioneer Natural Resources.

<https://oilprice.com/Latest-Energy-News/World-News/US-And-Russia-To-Dominate-Worlds-Oil-Gas-Pipeline-Spending.html>

## Russia-Saudi Plans for Super-OPEC could reshape global order

When the group overseeing the so-called OPEC+ deal met, proceedings were dominated by two nations: Saudi Arabia and Russia. It was probably a snapshot of the oil market's future. Beyond the drama of this week's diplomatic efforts to agree to an increase in oil production, the more significant longer-term development may be moves to make Russia's role in managing global supply permanent, bringing together the two largest oil exporters. Russia isn't a member of OPEC, but for the last two years has led a group of countries outside the group lending support to the cartel, creating a coalition of 24 producers that's been dubbed OPEC+. Russian Oil Minister Alexander Novak said in a speech yesterday that "we need to build upon our successful cooperation model and institutionalize its success through a broader and more permanent strategically focused framework." His Saudi counterpart Khalid Al-Falih echoed those comments and OPEC President Suhail Al Mazrouei today said a charter for the enlarged group had been circulated with a view to an agreement by the end of the year. The countries are considering inviting all 24 countries to join a permanent body with its own constitution and secretariat, according to people familiar with the matter, asking not to be identified because the discussions are private. It would mark a seismic shift in oil's world order and while it probably won't supplant OPEC in the short term it would create a rival for the organization that's sought to manage supply for six decades. It's possible the new body would have a different structure to OPEC's principle of one member, one vote. Larger producers such as Saudi Arabia and Russia might be given more weight in the new body, the people said. The wider group risks turning into little more than a talking shop, not least because, unlike OPEC, Russia has traditionally seen supply management as a tactic rather than a strategy, to be deployed in cases of extreme market imbalance. In 2008, Russia helped found the Gas Exporting Countries Forum, something many expected to become an OPEC-style organization for the global gas market. Despite having a permanent secretariat and annual meetings, it's had little impact on supply.

The super-OPEC grouping might merely formalize current relationships. Falih and Novak have formed a close working relationship over the past two years, one that often seems to bypass OPEC's more traditional decision-making process. They often brief the media together on policy, outside the cycle of formal meetings.

Saudi Arabia and Russia together pump about 21 million barrels a day -- or one fifth of global supply. Without Saudi Arabia, the rest of OPEC produces about 20 million barrels, International Energy Agency data show.

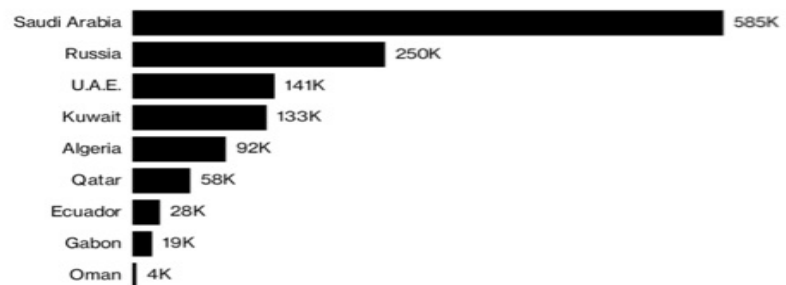
For Saudi Arabia, the new group would have the advantage of diminishing the influence of Iran, the kingdom's main rival in the Middle East. At this week's meeting, Iran had threatened to block Saudi Arabia's plan to increase output, something it could do under the current rules even if every other member of the group backed the proposal.

[Source: LNG Global/Bloomberg](https://www.bloomberg.com/news/articles/2020-03-06/russia-saudi-plans-for-super-opec-could-reshape-global-order)

### Who's Got the Juice?

Saudi Arabia and Russia could potentially return the most oil to the market.

■ Size of output cut since 2016 in barrels a day



Note: Excludes countries the IEA says aren't capable of rolling back their output cuts  
Source: IEA, OPEC

Bloomberg

## China takes gas crown as clean-air push powers it past Japan

China's drive for cleaner skies has pushed it past Japan to become the world's largest buyer of natural gas, a milestone for a nation that wasn't even importing the fuel 15 years ago. The development underscores how rapidly China is boosting natural gas use at the expense of dirtier fuels like oil and coal to meet President Xi Jinping's pollution-cutting goals. Governments, especially in the country's northern regions, have forced millions of homes and factories to replace coal boilers with gas burners. China imported 7.41 million metric tons of natural gas through pipelines and seaborne tankers in May, according to data released Saturday by the General Administration of Customs. That puts it at 34.9 million tons for the first five months of the year. Japan's imports during that period total 34.5 million

tons, according to its Ministry of Finance. China bought more than Japan in some months last year, but this is the first time its cumulative imports during a year have been higher. The nation's soaring natural gas demand has been a boon for the global liquefied natural gas market. China's on track to become the world's biggest LNG importer by 2021 as growth in domestic production and pipelines won't be able to keep pace with needs, analysts at JP-Morgan Chase & Co. said in a report June 15. LNG became the biggest source of China's overseas gas supply most months over the past year. The nation imported 4.15 million tons of the fuel via tanker last month, compared with 3.27 million tons by pipeline, Saturday's data show. Piped gas supplies could get a boost late next year when Russia starts up its Power of Siberia pipeline.

<https://www.businesstimes.com.sg/energy-commodities/china-takes-gas-crown-as-clean-air-push-powers-it-past-japan>

## Japan's Osaka Gas to take part in U.S. shale gas project

Japan's Osaka Gas says it has agreed with Sabine Oil & Gas Corp and its subsidiary to buy a working interest in a shale gas project in Texas for about 16 billion yen (\$144.53 million). Osaka Gas will acquire a 30 percent stake in the formations in the shale assets in East Texas, a company spokesman said, marking a second acquisition of a U.S. shale gas stake. The project participants plan to continue developing the project and increase gas production from the current level of about 300,000 tonnes per year of liquefied natural gas (LNG) equivalent, it added.

<https://www.hellenicshippingnews.com/japan-osaka-gas-to-take-part-in-u-s-shale-gas-project/>



## Russian oil and gas sector grows despite sanctions

The Russian oil and gas industry is booming, riding a surge in prices and a weaker ruble, and encouraged by initial successes in the largely untapped Arctic, says Financial Times. It seems that the industry has proven its resilience amid Western sanctions and ever-increasing technical demands. Last month, Moscow Stock Exchange's oil and gas index surged to its highest ever level. Moody's rating agency expects "rated Russian oil and gas companies' operating cash flows to exhibit strong growth in 2018, which will bolster their already robust liquidity profiles and result from a combination of higher oil prices, a weak ruble and a favourable domestic taxation system for oil exports". Top Russian producers' financial results confirm Moody's opinion: Rosneft recently reported a sevenfold increase in its first-quarter net profit, while Lukoil showed a surge by 75% compared to last year's corresponding period. Both companies have announced plans to buy back their shares in the next years. Gazprom reported an increase in profit by 11% with a record rise in revenue. Investment in the sector is also blooming, confirmed by numerous agreements that state-controlled energy giants sign with international groups. In May, Total acquired a 10% stake of a new liquid natural gas project in the Russian Arctic, while UAE-based Mubadala Petroleum bought a 44% stake in a Russian oilfield. "In my opinion, the stability of Russian production was underestimated by the market," said CEO of Rosneft Igor Sechin. "In general, the Russian oil sector investments in ruble equivalent under the crisis conditions were increasing, and so did the production." The oil industry's financial cheer is largely a result of a December 2016 deal between Russia and OPEC to cut global crude output by 1.8 million bpd. The agreement helped to decrease oil glut and drag prices up from historical lows. In May, Brent crude hit \$80 per barrel, calling the current production cap into question. This month, Moscow and Riyadh will hold talks with other participants on easing the cap by 1 million bpd. In case of success, Russian producers are ready to ramp up output, as they have some spare capacity.

<https://www.hellenicshippingnews.com/russian-oil-and-gas-sector-grows-despite-sanctions/>

## Azerbaijan's Jan-May gas exports from Shah Deniz I fall 5.2 percent/yr

Azeri gas exports from the first stage of its giant Shah Deniz field fell by 5.2% to 3.031 BCM in the first five months of this year compared with the same period in 2017 according to the State Statistics Committee. Gas from Shah Deniz I is exported through the South Caucasus pipeline. Export volumes from Shah Deniz I operated by an international consortium led by BP were 7.314 BCM in 2017. Azerbaijan's gas exports through all pipelines totalled 9.897 BCM in January-May this year. The European Union is trying to reduce its dependence on Russian gas by developing the so-called Southern Gas Corridor, which is expected to bring about 16 BCM of gas a year to Europe by 2020. The gas would come from the Shah Deniz II field via the 1,850 km (1,150 mile) Trans-Anatolian Natural Gas Pipeline (TANAP) through Turkey, the South Caucasus pipeline extension through

Georgia and the Trans-Adriatic Pipeline (TAP) to Greece, Albania and Italy.

<https://www.hellenicshippingnews.com/azerbijans-jan-may-gas-exports-from-shah-deniz-i-fall-5-2-pct-yr-yr/>

## Germany says G20 countries must 'get out of coal', natgas can be bridge

Member nations of the Group of 20 "have to get out of coal" to reduce greenhouse gas (GHG) emissions and fight climate change, while natural gas can be a bridge fuel, Germany's director of energy policy Thorsten Herdan said on Friday, June 15. Speaking at a press conference at the close of the G20 meeting of energy ministers in Bariloche, Argentina, Herdan said he expected competition between pipeline gas and liquefied natural gas (LNG) to boost liquidity in the market and drive down prices.

<https://www.hellenicshippingnews.com/germany-says-g20-countries-must-get-out-of-coal-natgas-can-be-bridge/>

## China puts U.S. energy in the cross hairs of trade war

China has more options for oil, but would've shot itself in the foot by targeting LNG, analysts said. The U.S. energy market was dealt a significant blow by Chinese tariffs because it has few other outlets as big as China for oil exports, analysts said. China last week responded to U.S. trade decisions by saying it would strike back with duties on U.S. exports, including oil. Commentary published Sunday, June 17, in the official Xinhua News Agency criticized U.S. President Donald Trump for trade action it said would isolate the world's largest economy. "If Washington is unable to stop its capriciousness, which costs the interests of people of both countries, reciprocal tariffs are the leverage China has no choice but to use," it read. First quarter crude oil exports to China averaged around 300,000 barrels per day. The U.S. Energy Information Administration reported a four-week moving average for crude oil exports for the week ending June 8 of 1.9 million bpd, up 139% from the same period last year. Analysis emailed to UPI from consultant group Wood Mackenzie found China has alternative suppliers apart from the United States. "While China could secure the crude from alternative sources such as West Africa which has similar quality as the U.S. crude, the United States would find it hard to find an alternative market that is as big as China," Suresh Sivanandam, a senior manager for Asia refining at Wood Mackenzie, said in a statement. Xinhua that the Chinese industrial sector was accelerating. That growth resulted in an increase in energy consumption last month. The National Security Strategy unveiled last year by the U.S. president included energy as one of its central pillars. The Trump administration said in the doctrine it would promote energy exports, increased markets access and a competitive U.S. edge.

Congressman Ted Poe, R-Texas, the chairman of a terrorism subcommittee in the House of Representatives, said the United States could use its energy as a "force multiplier" for U.S. leverage overseas. Energy trade, meanwhile, could balance a trade deficit between the world's two largest economies. China did not, however, target LNG. Nicholas Browne, Wood Mackenzie's lead analysts on gas in the Asia-Pacific market, said trade restrictions on U.S. LNG would backfire for a Chinese economy looking to chart a greener future. "It would also have created logistical headaches for suppliers to optimize their portfolios to ensure they could meet Chinese demand while redirecting U.S. LNG to other markets," he said.

[Source: LNG Global](#)

## Nigeria targets 10% global LNG market

Nigeria has revealed a new approach to harness its tremendous gas resources with the aim to capture 10 per cent of the world's market share in traded Liquefied Natural Gas (LNG) as part of measures to derive maximum value from its abundant natural gas resources. Group Managing Director of the Nigerian National Petroleum Corporation (NNPC), Dr. Maikanti Baru, disclosed this while addressing the 27th World Gas Conference (WGC) in Washington DC, United States. Speaking at a session on 'The Role of Gas in Power Generation' under the theme 'Fueling the Future,' Baru said Nigeria has enormous gas potentials and their huge contributions to the nation's economy is great. "We are focused on jumpstarting and sustaining gas supply to support a rapid growth in power generation, re-positioning Nigeria as the regional hub for gas-based industries such as fertilizer, petrochemicals, methanol, Liquefied Petroleum Gas (LPG), as well as leveraging our enormous reserves position to strengthen our footprints in high value

gas export through LNG and regional gas pipelines," Baru told delegates at the triennial gas gathering. He said with emerging gas markets and the need to generate more power across Africa's Sub-Saharan region, there abound an unprecedented investment opportunity in the gas sector for the country. According to the GMD, Nigeria is focused on expanding its existing 22 million metric tonnes per annum (MTPA) Nigerian LNG plant with additional 8MTPA from its proposed Train 7, a development that will significantly increase global power generation capacity.

<https://leadership.ng/2018/06/30/nigeria-targets-10-global-lng-market/>

## After Gazprom probe, EU investigates Qatar's long-term LNG contracts

The European Commission is investigating the bloc's biggest sea-borne gas supplier Qatar Petroleum over potentially restrictive 20-year supply agreements inhibiting development of a single gas market, its latest challenge to a major gas supplier. The bloc, having just wrapped up a seven-year market abuse probe into

Russian giant Gazprom, said it sought to determine if Qatar's LNG supply deals with European utilities barred them from diverting shipments within the region. So-called destination clauses are a fixture of long-term LNG deals that tie buyers to receiving shipments at a specific port, thereby preventing cargo diversions that could undercut Qatar in a third market. Qatar is the world's biggest LNG producer and its geographical location between Europe and Asia also allows it to swing supply to the most lucrative market, which causes periodic supply shortages particularly in northwest Europe. Roughly speaking, Qatar offers two types of LNG supply arrangements in Europe. The classic long-term deal prevalent across southern Europe forces the buyer to take or pay for a fixed annual quantity of LNG even if they do not need it. In such cases, diversion curbs may limit the benefit to Europe given that Italy's Edison, for example, couldn't freely send emergency supplies of Qatari LNG to plug potential shortfalls in southern France. The second contract type confined to northwest Europe leaves it largely up to Qatar as to how much LNG arrives at port. The world's biggest LNG importer Japan has led the backlash against destination curbs in LNG deals, a throwback to a time when producers held the upper hand, after its Fair Trade Commission last year banned the practice in any new deals. The probe into Qatar's LNG deals follows extensive consultation between the European Commission and Japan's Ministry of Economy, Trade and Industry in recent months exploring the impact of such curbs on gas market development and price transparency, workshop presentations seen by Reuters show.

EU anti-trust regulators ultimately decided against fining Gazprom after finishing the seven-year probe in May, but it did force Gazprom to reform its pricing structure and allow buyers in eastern and central Europe greater control over supply. Under EU rules, destination restrictions hold no sway once pipeline gas or LNG shipments arrive at European ports. While this has liberated piped gas flows across the region, LNG is more cumbersome to re-export from one port to another, heightening market divisions. Qatar supplied 43% of the EU's LNG last year at 16.81 MMT compared to 38.65 MMT in total, according to data from the International Group of LNG Importers. Nigeria and Algeria were the next biggest suppliers with just over 7 MMT.

[Source: LNG Global/Reuters \[Edited\]](#)

## Global LNG-Asian spot price sinks as ending outages boost supply

Asian spot liquefied natural gas (LNG) prices sank this week after a four year high, snapping a four-week rally as production outages in the United States, Qatar and Malaysia wrapped up and producers fed supply into the market. Spot prices for August LNG-AS delivery in Asia fell \$1.10 per MMBtu to \$10.60 per MMBtu, marking a rapid reversal in sentiment despite large purchase tenders in the Atlantic and Middle East. More than 40 cargoes were sought by buyers in Mexico, Argentina, Egypt and Pakistan for June-September delivery, adding to brisk weather-driven demand from China and northeast Asia. Some of the tenders were not fully filled, such as Egypt, due to either a lack of offers or high prices. Offers for Pakistan's July-August requirement were also thin on the ground. Yet the majority of demand was successfully filled, traders said. A source said one of two Qatari liquefaction trains, taken offline for two-weeks each, resumed output, while the other was not yet in full operation. In the United States, a month-long maintenance on the third liquefaction train at Sabine Pass ran its course, with gas inputs into the facility recovering to pre-outage levels. At the same time, traders said exports from Malaysia's 24 MMTPA Bintulu complex had recovered to normal levels, an assertion borne out by ship-tracking data which shows a weekly jump in exports. Chevron's Wheatstone project commenced exports from its second production train. "A large amount of supply was written off because of outages, but in the end how tight was the market really?" a trade source said. Soon after the tenders closed or were awarded, more supply was offered into the market from Russia, Australia, Cameroon. More maintenance is around the corner, including a planned outage for Angola LNG in July and Peru LNG will halt shipments for three-weeks from July 27. The APLNG plant on Curtis Island off the east coast of Australia will also undergo partial maintenance over July, August and September, affecting half of a train. Thick sea ice impeded shipments from Russia's Arctic LNG plant in Yamal this week but supplies appear to be moving toward Europe again. The Boris Vilkitsky tanker has left the Bay of Ob after a week of idling fully-laden in the area of the liquefaction plant, shipping data showed.

[Source: LNG Global/Reuters \(Reporting by Oleg Vukmanovic Editing by Toni Reinhold\)](#)

## Tokyo Gas, Britain's Centrica to buy LNG from Mozambique

Tokyo Gas Co and Great Britain's Centrica PLC on Friday said they had signed a basic agreement with the sales entity of Mozambique Area 1 joint venture partners for the long-term offtake of liquefied natural gas (LNG).

The two firms will buy about 2.6 million tonnes of LNG per year from the start-up of production expected in the first half of the 2020s until the early 2040s, they said in a statement.

<https://www.hellenicshippingnews.com/tokyo-gas-britains-centrica-to-buy-lng-from-mozambique/>

## ExxonMobil Papua New Guinea LNG export plant offers cargo for July: sources

ExxonMobil's Papua New Guinea liquefied natural gas (LNG) export plant has offered a cargo for July delivery, two industry sources said on Tuesday, June 19. The cargo is being offered on a delivered ex-ship (DES) or free-on-board (FOB) basis, one of the sources said. It will load from the plant around July 6-7 and will arrive in Japan or Taiwan over July 15-22, or into South Korea or China over July 16-23 or into Dahej, India on July 20, the source added. Bids are due by June 20 and will remain valid until June 22.

<https://www.hellenicshippingnews.com/exxonmobil-papua-new-guinea-lng-export-plant-offers-cargo-for-july-sources/>

## First Bangladesh onshore LNG terminal likely by 2024

The government is mulling the establishment of the first ever onshore LNG terminal at Maheshkhali in Cox's Bazar, making it the country's third LNG terminal. "Bangladesh is discussing the proposed construction with Petronet India Limited and China Huanqiu Contracting and Engineering Corporation (HQC), a subsidiary of China National Petroleum Corporation," said Zanendra Nath Sarker, joint secretary of the Energy and Mineral Resources Division. "Either of the two companies will be tasked with the project at Maheshkhali," he said. "The land-based terminal with a 1,000 mmfd capacity is expected to be built by 2024 or 2025." Energy experts and consumer rights activists have previously criticized the decision to import costly liquefied petroleum gas (LNG), claiming it would result in raised gas prices and distribution charges. Sarker made the remarks while addressing a

public hearing on the proposed hike of gas distribution charges. The Bangladesh Energy Regulatory Commission (BERC) heard the appeal of Karnaphuli Gas Distribution Company Limited (KGDCL) at the TCB auditorium in Karwan Bazar on Tuesday, June 19. The other two terminals are offshore LNG terminals. One was built by US-based Excelebrate Energy, while the other is being constructed by local conglomerate Summit Group. Discussing the delay in pumping LNG imported from Qatar to the national grid, the joint secretary said the pipeline installation work had gone badly because of heavy rainfall the country experienced during the middle of the year. As soon as the 42-inch diameter pipeline is constructed through Maheshkhali to Feni via Anwara and Fouzderhat in Chittagong, the LNG will be added to the national grid, Sarker said.

<https://www.dhakatribune.com/business/2018/06/19/first-bangladesh-onshore-lng-terminal-likely-by-2024>

## Novatek's Yamal LNG plant begins first eastward export to Asia

The Novatek-operated Yamal LNG production facility in northern Russia has begun its first exports eastward to Asia, with the Vladimir Rusanov currently at

sea headed east along the Northern Sea Route (NSR). According to S&P Global Platts trade flow software cFlow, the Vladimir Rusanov left the port of Sabetta on Monday, June 26.

The cargo marks the first time that Yamal LNG -- which began exports in December last year from its first 5.5 million m/year train -- has exported LNG directly eastward after Arctic ice-melt made sailings in that direction possible for Novatek's fleet of icebreaking LNG tankers. The cargo is understood to be destined for China, with a source close to the matter saying the cargo was marketed by Novatek to Petrochina on a spot basis.

Since the start of the year, Novatek has been loading cargoes every four-eight days aboard its fleet of specialized icebreaker vessels for delivery into north-west Europe. A total of 33 cargoes have been shipped aboard the fleet of five specialized Arc7 LNG tankers since the start of operations. Some cargoes have remained in Europe, while others were loaded via transshipment onto traditional LNG vessels for onward sailing to more premium markets, particularly in the Middle East and Asia.

<https://www.platts.com/latest-news/natural-gas/london/novateks-yamal-lng-plant-begins-first-eastward-27004714>

## Panama joins ranks of LNG importers, trade hub for Central America

Panama has imported its first LNG cargo to commission the newly built \$1 billion Costa Norte facility and power plant at Colon, expected to be a launch-pad for LNG trade across Central America. Many utilities in Central America and the Caribbean remain reliant on burning oil to generate electricity, but LNG offers a cleaner, cheaper and more efficient alternative. Shipping data shows the Engie-chartered Provalys tanker arrived last week, carrying a cargo exported from the Sabine Pass plant in Louisiana in March. AES Panama, a unit of U.S. electric utility AES with a 50 percent stake in the facility, announced the delivery on Friday, saying the cargo will supply the 380 MW AES Colon gas-fired power plant as test flows commence. In 2017, Engie and AES established a joint venture to market and sell LNG to third parties in Central America, using the 1.5 MMTPA capacity Panama terminal as a distribution hub. According to the deal, Engie will supply up to 0.4 MMTPA to the power plant from 2018. The terminal's remaining capacity will be used as a hub for onward sales within the region, including up to 0.7 MMTPA sourced by Engie mainly from the Cameron LNG plant, which is due to start production in early 2019. Costa Norte can reload initially imported cargoes for onward export to regional markets, truck from the terminal, and supply LNG as a ship fuel from its location at the mouth of the Panama Canal. The AES-Engie JV in Panama builds on a separate deal between the two companies struck in 2016, whereby both groups will market LNG in the Caribbean from the AES Andres' import terminal in the Dominican Republic. That terminal has the capability to re-load initially imported cargoes, enabling broader regional distribution using small vessels and potentially containers. The combined import capacity of both terminals is roughly 3 MMTPA.

[Source: Reuters/LNG Global \(Reporting by Oleg Vukmanovic; editing by David Evans\)](https://www.reuters.com/lng-global-reporting-by-oleg-vukmanovic-editing-by-david-evans)

## Endesa will open its second public natural gas station in Paris

Endesa and SIGEIF (the inter-council association for managing gas and electricity in Île-de-France) signed in Paris the contract for the design, construction and operation of a new public natural gas station in Île-de-France, the metropolitan area of Paris. It will be located in the area of Wissous to the south of the French capital and will supply trucks passing through this major logistical hub. Endesa's facility is expected to open in June 2019 and is part of the company's growth strategy in France and Europe through NGV, a fuel that reduces particle emissions by 95% and NOx emissions by between 40% and 65%. BioCNG, or methane from renewable sources, also lowers CO2 emissions by 90%. The contract was awarded as part of the plan to tackle pollution in the city of Paris and its metropolitan area. Endesa and SIGEIF, which includes 185 municipalities in the metropolitan area of Paris, have been working to provide concrete solutions to pollution since 2016, when the contract to build the first Endesa natural gas refuelling station in Île-de-France was signed. The latest contract adds to the four existing natural gas stations put into service by Endesa in Vannes (2017), Saint-Etienne (2017), Paris (2016) and Lyon (2015), as well as the two currently under construction in Saint Vincent de Tyrosse and Sarregemines.

<http://www.ngvjournall.com/s1-news/c4-stations/endesa-will-open-its-second-public-natural-gas-station-in-paris/>

## DHL brings eco-friendly LNG trucks to its long-haul road freight

DHL Freight, one of the leading providers of road freight services in Europe, has purchased four IVECO Stralis NP 400 trucks in Belgium. These heavy-duty trucks have a driving range of up to 1,500 kilometers and enable a total weight of tractor and trailer of up to 40 tons. The new LNG-powered trucks will be employed to create a sustainable transport solution for one of the world's largest developers and sellers of athletic footwear and sportswear. With the group strategy in mind, to reduce all logistics-related emissions net to zero by 2050, DHL Freight was inspired to purchase the tractors as a way to expand its current service offering for the global sporting-goods manufacturer. The customer himself is

ambitiously working on minimizing his environmental footprint. A sustainable transport solution to foster the partnership was, therefore, the next logical step. The option to choose sustainable shipping has evolved in the last two decades, growing from a niche market mostly confined to local urban solutions to now being cost-effective and implementable for heavy loads over long distances. The trucks purchased by DHL Freight meet the strict Euro 6 emissions standards, making them an excellent choice for future operations.

<http://www.ngvjournall.com/s1-news/c3-vehicles/dhl-brings-eco-friendly-lng-trucks-to-its-long-haul-road-freight/>

## Bolivia-Gazprom initiative to fund massive public transport move to natural gas

Alexey Tyupanov, CEO of Moscow-based Russian Export Center Group EXIAR, and Luis Alberto Sanchez, Minister of Hydrocarbons and Energy of Bolivia, signed a Memorandum of Understanding mid-June to secure financing for supplies of gas-fueled machinery and equipment produced by Russian vehicle manufacturers. Within the framework of the Bolivia's policy for changing the vehicle energy matrix, the signatories arranged for the direct credit financing by EXIAR for the provision of up to 20,000 Russian vehicles powered by natural gas for the transport sector of Bolivia. In this regard, the Minister of Hydrocarbons, Luis Alberto Sanchez that since the policy was introduced, "400,000 gasoline vehicles have

been converted to Compressed Natural Gas (CNG). The second phase of this project is to convert diesel-powered public transport vehicles to Liquefied Natural Gas (LNG) and CNG and for this we are looking at a Russian credit for the purchase of 20,000 vehicles. The credit facility from EXIAR will pass to the carriers and thus they could acquire new CNG and LNG vehicles direct from the factory." The MoU was signed as part of a broad-reaching agreement that will also see USD 1.2 billion invested by Gazprom in new and existing gas production in Bolivia.

<http://www.ngvglobal.com/blog/bolivia-gazprom-initiative-to-fund-massive-public-transport-move-to-natural-gas-0621>

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## CNG refueling network program for Russia 2018 successfully completed

A Gazprom delegation led by Viktor Zubkov, Chairman of the Company's Board of Directors, visited a renovated CNG filling station of Gazprom in Aksai during a business trip to the Rostov Region. The facility in Aksai is among the refueling stations supplying natural gas to vehicles that carry the participants and guests of the 2018 FIFA World Cup Russia™. In preparation for the World Cup, Gazprom made extensive efforts to build state-of-the-art natural gas refueling infrastructure in all of the 11 host cities. The efforts involved 47 CNG stations, of which seven were built and four were renovated this year. "By the start of the World Cup, Gazprom renovated four stations here in the Rostov Region: two in Rostov-on-Don, one in Aksai, and one in Bataisk. The upgraded CNG stations supply natural gas to 50 large buses acquired for the event by the regional administration, as well as to gas-fueled taxi fleets," said Zubkov. "Overall, Gazprom's program for the construction and renovation of NGV refueling infrastructure prior to the global football championship is 100 per cent complete. Today, 47 facilities in 11 host cities provide vehicles with natural gas," added Zubkov.

<http://www.ngvjournall.com/s1-news/c4-stations/cng-refueling-infrastructure-program-for-russia-2018-successfully-completed/>

## UPS invests \$130M in more natural gas vehicles and refueling facilities

UPS announced plans to build an additional five CNG fueling stations and add more than 700 new CNG vehicles including 400 semi-tractors and 330 terminal trucks. This \$130 million dollar investment in CNG capacity for 2018 builds on previous UPS investments of \$100 million dollars in 2016 and \$90 million dollars in 2017. UPS will have invested more than \$1 billion in alternative fuel and advanced technology vehicles and fueling stations from 2008 through 2018. Building CNG and LNG capacity is an important enabler for increasing UPS's use of renewable natural gas. Biomethane yields up to a 90% reduction in lifecycle greenhouse gas emissions when compared to conventional diesel. Last year, UPS used 15 million gallon equivalents of biomethane. The company is the largest consumer of this biofuel in the transportation sector. The five new CNG stations will be in Goodyear, Ariz., Plainfield, Ind., Edgerton, Kan., Fort Worth, Texas, and Arlington, Texas. 400 semi-tractors will be supplied by Freightliner and Kenworth and 330 terminal trucks by TICO. UPS will deploy the new CNG vehicles on routes to utilize the new CNG stations as well as adding to existing natural gas fleets in other UPS locations including Atlanta, Ga., and, Salt Lake City, Utah. UPS currently operates more than 50 natural gas stations strategically located across the U.S., and, outside the U.S. in Vancouver, Canada, and Tamworth, United Kingdom. <http://www.ngvjournals.com/s1-news/c3-vehicles/ups-invests-130m-in-more-natural-gas-vehicles-and-refueling-stations/>

## Endesa introduces Europe's first high-powered natural gas trucks

The fleet transporting coal for Endesa, between the Port Terminal of Ferrol and the Thermal Production Unit of As Pontes (A Coruña), has added three new LNG trucks with high power and high ecological efficiency, the first of their kind to circulate on European roads. This improvement responds to Endesa's interest in continuing with its commitment to natural gas and its related-environmental improvements, a challenge that was joined by Pérez Torres Marítima, the company that provides the coal transportation service. It also means Endesa's commitment to LNG. The three new vehicles operated by Pérez

Torres Marítima are IvecoStralis NP 460, which are joining the existing IvecoStralis NP 400 also with LNG propulsion. With engines that develop 460 horsepower, these are the first LNG trucks with twelve-speed automated transmission that guarantees greater driving comfort and lower fuel consumption, with almost 40% cost savings over diesel. In addition, the new model can travel up to 1,600 kilometers without refueling, with the consequent saving of time and range before needing to be supplied at a service station. Likewise, maintenance intervals are increased to 90,000 kilometers. Thanks to LNG consumption, the trucks emit 10% less CO<sub>2</sub>, 60% less NO<sub>x</sub> and 80% less CH<sub>4</sub> than diesel trucks. The engine noise is also lower. These improvements in the environmental efficiency of transport are of great interest to Endesa, because the entire fleet has a daily average of 800 Ferrol-As Pontes trips, which amount to 150,000-180,000 per year.

<http://www.ngvjournals.com/s1-news/c3-vehicles/endesa-introduces-eu-ropes-first-high-powered-natural-gas-trucks/>

## Spanish agreement will help boost CNG and hydrogen as vehicle fuels

Enagás and the Spanish Confederation of Service Station Owners (CEEES) have signed an agreement to work together to promote and boost the use of natural gas and hydrogen as alternative fuels for transportation. The collaboration includes, among other elements, the performance of a technical viability analysis for the construction of refueling facilities for natural gas and hydrogen powered vehicles at some of the 5,000 service stations that make up the CEEES network in Spain. The agreement has an initial duration of one year and can be extended automatically for one-year periods. In addition, Enagás and the CEEES are working together on other courses of action to promote these energy sources as alternative fuels for transportation, in line with their commitment to contributing to the well-being of society and improving air quality. Enagás will participate in this project through Scale Gas Solutions, a start-up that emerged from within its Open Innovation and Corporate Entrepreneurship Program, Enagás Empeñe. <http://www.ngvjournals.com/s1-news/c1-markets/spanish-agreement-will-help-boost-cng-and-hydrogen-as-vehicle-fuels/>

## NGV Global leads new work under ISO's SC41 for gaseous fuels

Work has commenced on the development of a completely new set of ISO standards intended to certify personnel involved in the Gaseous Fuels industry. The task belongs to WG 9, one of seven active Working Groups under ISO TC22/SC41 Specific Aspects for Gaseous Fuels the Technical Committee dealing specifically with all fuel systems and tasks related to the use of Gas as a fuel for road vehicles. WG 9 is led by NGV Global. ISO specifies the Scope of subcommittee SC41 as "Specifications of construction, installation and test of components for vehicles using gaseous fuels, including their assemblies and the interface with refuelling systems". SC41 has 7 active working groups, 18 participating countries and 12 observing countries. It has 32 standards under development. Working groups 3 and 9 are under the leadership of NGV Global's Executive Director, Diego Goldin. WG 3 is carrying out the revision of the standards for CNG fuel system components (ISO 15500 series) following the receipt of comments from members during a ballot late 2017. Goldin has led WG 3 for ten years. Following receipt of a proposal in 2017 which was adopted last month, WG 9 is starting to develop a completely new set of standards intended to certify personnel involved in the Gaseous Fuels industry.

<http://www.ngvglobal.com/blog/ngv-global-leads-new-work-under-isos-sc41-for-gaseous-fuels-0616>

## Total and Pavilion Energy take a further step in developing LNG as a marine fuel in Singapore

Total and Pavilion Energy, through their subsidiaries Total Marine Fuels Global Solutions and Pavilion Gas, have signed Heads of Agreement (HoA) to jointly develop a LNG bunker supply chain in the port of Singapore. The agreement covers the shared long-term time charter of a new generation LNG bunker vessel (LNG-BV) to be commissioned by Pavilion Gas by 2020. It also includes an LNG supply arrangement between the two companies enabling Total to deliver LNG bunker to its customers. The HoA, signed on the sidelines of the World Gas Conference 2018, follows a Memorandum of Understanding (MoU) concluded by both companies in April 2017 on LNG bunkering cooperation in Singapore. The HoA is a significant step forward and contributes to the development of Singapore as an LNG bunkering hub. The move toward LNG as a bunker fuel is a suitable solution following the decision of the International Maritime Organization (IMO) to set limits on sulphur content in marine fuels from 2020. LNG bunker not only produces zero sulphur oxides, but it also represents an available and competitive solution, which contributes to IMO's long-term strategy on the reduction of greenhouse gas emissions from ships announced in April 2018. Pavilion Gas is committed to the development of Singapore as an LNG hub. In October 2016, Pavilion Gas was appointed as one of two importers to supply LNG to Singapore by the Energy Market Authority of Singapore. In January 2016, Pavilion Gas was awarded the LNG Bunker Supplier Licence to supply LNG bunker to vessels in the Port of Singapore.

<https://www.hellenicshippingnews.com/total-and-pavilion-energy-take-a-further-step-in-developing-liquefied-natural-gas-lng-as-a-marine-fuel-in-singapore/>

## BP seeks to lease LNG tanker for at least 9 months as day-rates rise

BP Shipping on Thursday notified the liquefied natural gas (LNG) market of its interest in leasing the British Ruby or its sister vessel for a minimum of nine months from Dec-Q1 2019, according to a note seen by Reuters. BP invites expressions of interest for the LNG tanker by Friday, June 22. LNG charter day-rates are at multi-year peaks amid growing incentives

to divert Atlantic-produced supply east as major consumers led by China ramp up imports, lengthening ship journey times and tightening availability of vessels. Daily charter rates in the Atlantic reached \$85,000 compared to \$65,000 in the preceding week.

<https://www.hellenicshippingnews.com/bp-seeks-to-lease-lng-tanker-for-at-least-9-months-as-day-rates-rise/>

## Angelikoussis' Maran Gas to build LNG carrier with Daewoo Shipbuilding

Daewoo Shipbuilding & Marine Engineering Co., the world's second-largest shipbuilder by orders, said Thursday it has clinched a deal to build a liquefied natural gas carrier for a Greek shipping company. The shipbuilder said it is set to deliver the carrier that can hold 173,400 cubic meters of LNG to Maran Gas Maritime by the second half of 2020. Daewoo Shipbuilding declined to disclose the contract price. The shipbuilder said it has received \$3.2 billion worth of ship orders for 26 vessels so far this year.

<https://www.hellenicshippingnews.com/angelikoussis-maran-gas-to-build-lng-carrier-with-daewoo-shipbuilding/>

## DongsungFineTec wins \$18.4 mn ship insulator deal from Hudong-Zhonghua

South Korea's cryogenic insulator manufacturer DongsungFineTec Co. has signed a 20 billion won (\$18.4 million) contract with China's Hudong-Zhonghua Shipbuilding to supply vessel insulators for liquefied natural gas (LNG) ships, the company said. Under the contract, the Korean company will provide vessel insulators for five units of 22,000 twenty-foot equivalent unit (TEU) LNG-fueled container ships that the Chinese shipbuilder will build for leading global container shipping company CMA-CGM Group based in France. The vessels for which DongsungFineTec will supply its materials are the world's first LNG ship orders that would meet the new environmental regulations set by the International Maritime Organization (IMO), DongsungFineTec said, adding that the company hopes that the latest deal can help it win more similar orders from home and abroad. Before the deal, the Korean company in March introduced an LNG Brick tank using the latest technology of France's GTT that is expected to help reduce ship construction time. It is also seeking to offer its materials for LNG bunkering ships.

<https://www.hellenicshippingnews.com/dongsung-finetec-wins-18-4-mn-ship-insulator-deal-from-hudong-zhonghua/>

## LNG preferred as transport fuel, but lack of infrastructure a barrier – Deloitte industry survey

Switching to LNG is the preferred solution for shipping companies to adopt in order to meet the International Maritime Organization's (IMO) stringent new international emissions standards for marine bunker fuels, according to the findings of a survey by Deloitte. However, a lack of refueling and bunkering infrastructure has been identified as the key barrier to the large scale adoption of LNG as a transport fuel. The survey of over 80 senior energy industry leaders from across the Asia Pacific region was conducted at the second annual Deloitte Energy Trading Summit in Singapore recently. Survey respondents cited the retrofitting and/or redesign of the existing shipping fleet to accommodate the LNG bunker fuel option as the second biggest barrier to adoption, followed by the price competitiveness of LNG versus liquid fuels. However, despite the challenges, over two-thirds (68 percent) said if the marine fuel market switches to LNG, it will have a positive effect on their overall business. Bernadette Cullinane, Deloitte Global LNG leader and Australia oil and gas lead said: "LNG is particularly well placed to benefit from the IMO's emissions legislation. Our survey results are clear recognition the stricter standards will open the door for cleaner marine fuels like LNG and low sulphur marine gas oil to displace heavy fuels. "Transportation is a terrific opportunity for LNG suppliers to tap into a growing market. By expanding the customer base, it's a play that will help underwrite and de-risk future supply developments."

<https://www.hellenicshippingnews.com/lng-preferred-as-transport-fuel-but-lack-of-infrastructure-a-barrier-deloitte-industry-survey/> [Edited]

### **Daewoo Shipbuilding delivers LNG ship with full re-liquefaction system**

Daewoo Shipbuilding & Marine Engineering Co. said Tuesday it has delivered a liquefied natural gas (LNG) carrier with a full re-liquefaction system (FRS) to a client, paving the way for additional orders for ships with the high-end system. It is a major achievement for the world's second-biggest shipbuilder by orders as the company now has the technology to build LNG ships with either the partial re-liquefaction system (PRS) or the FRS system, Daewoo Shipbuilding said in a statement. In 2016, Daewoo Shipbuilding delivered an LNG ship with the PRS system to a client for the first time in the market. Most of the LNG ship orders the company has received so far this year include the FRS system, the statement said. The company also has the technology to apply the FRS system to an LNG ship powered either by a high-speed ME-GI engine or by a low-speed X-DF dual-fuel engine, a spokesperson said. As the FRS technology allows an LNG ship to fully liquefy evaporated gas, shippers are increasingly placing orders for LNG ships with the advanced technology, he said.

<https://www.hellenicshippingnews.com/daewoo-shipbuilding-delivers-lng-ship-with-full-re-liquefaction-system/>

## **INTERNATIONAL: NG/LNG UTILISATION- ROADWAYS**

### **Clean Energy facilitates 168 near zero RNG truck grant applications**

Clean Energy Fuel Corp., provider of natural gas and renewable natural gas (RNG) fuels for transportation, has facilitated the filing of grant applications for 168 heavy-duty trucks equipped with the latest near zero engine technology and powered by Clean Energy's Redeem™ renewable natural gas. Using funding made available by the Carl Moyer Grant Program, the technology and fuel will contribute to lowering emissions on Southern California roads. The Program funds clean technologies aimed at improving air quality and are administered by the South Coast AQMD. With the support of Clean Energy, grant applications for 168 vehicles were submitted for a diverse array of trucking applications including port trucks that service the Ports of Los Angeles and Long Beach, regional delivery trucks, and concrete mixers. New trucks that receive Carl Moyer funding are taking advantage of Clean Energy's Redeem Dollar Deal Program, which is helping customers switch to a zero emissions solution, a combination of the new CWI natural gas engine and Redeem renewable natural gas (RNG) fuel. The first 250 qualifying trucks are locking in a \$1 per gallon rate on Redeem for one year, available at all Clean Energy stations throughout California. When near zero emission trucks are fueled by RNG, GHG emissions can be reduced by 60 to 400 percent. In 2017, over 67 percent of natural gas fleet fuel consumption in California was with RNG, and this number is expected to climb to about 90 percent by the end of this year.

<http://www.ngvglobal.com/blog/clean-energy-facilitates-168-near-zero-rng-truck-grant-applications-0620>

## **TECHNOLOGICAL DEVELOPMENT FOR CLEANER ENVIRONMENT/BIO-METHANE**

### **Canada's first retail hydrogen filling station opens in Vancouver**

Shell and Hydrogen Technology & Energy Corporation (HTEC) have launched the first retail hydrogen vehicle refueling station in Canada open to the public, and the first of three sites that both companies plan to open in Vancouver. Critical investment in the station comes from LGM Financial Services, along with funding from both the Provincial and Federal governments, through the BC Ministry of Energy, Mines and Petroleum Resources and Western Economic Diversification Canada's WINN initiative respectively. The launch of the Vancouver station follows similar openings in the UK, California, and in Germany, where Shell is part of a joint venture with the ambition to open a network of up to 400 hydrogen sites by 2023. Shell is also assessing the potential of future projects in the United States, Switzerland, Austria, France, Belgium, Luxembourg, China and the Netherlands. "HTEC is proud to be partnering with Shell to build three retail hydrogen stations as part of a six-station network in Greater Vancouver and Victoria," said Colin Armstrong, CEO of HTEC. "Refueling infrastructure must be in place to support hydrogen fuel cell vehicle rollouts and it's exciting to see Canada's first wave of retail hydrogen refueling stations being built here in BC."

<http://www.ngvjournal.com/s1-news/c7-lng-h2-blends/canadas-first-retail-hydrogen-refueling-station-opens-in-vancouver/>

**All news and features carried in this NGS NG/LNG Update  
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