



SNAPSHOT

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11th CGD round launched:

One of the most important highlights of the year was the 11th CGD round. PNGRB offered 65 geographical areas (GAs) spread across 215 districts in 19 states and 1 Union Territory covering 26% of India’s population and 33% of its area. The round attracted an overwhelming response and received more than 430 bids in 61 GAs. The round is expected to bring in an investment of more than Rs 80,000 crores.

Over 50 city gas distribution areas planned to be put under common carriers list:

PNGRB invited comments from companies in September 2021 for listing more than 50 city gas distribution licensed areas, including Delhi, Mumbai & large parts of Gujarat, as common carriers. The exclusivity period of some of these areas expired in 2012.



AG&P inks MoU with Government of Tamil Nadu:

Atlantic, Gulf & Pacific Company (AG&P) & the Government of Tamil Nadu signed an MoU according to which AG&P would invest Rs 2,700 crores to build CGD networks in Kanchipuram, Chengalpattu, Vellore, Ranipet, Thirupathur & Ramanathapuram districts of Tamil Nadu.

KEY APPOINTMENTS IN 2021



Sh. Hardeep Singh Puri took charge of the Ministry of Petroleum and Natural Gas.



Sh. Pankaj Jain, took charge as the new Secretary, Ministry of Petroleum and Natural Gas in December 2021.



Sh. Gajendra Singh joined as the Member, PNGRB.



Sh. Anjani Kumar Tiwari joined as the Member, PNGRB.



Sh. Subhash Kumar took the additional charge of the post of CMD of ONGC.



Sh. Akshay Kumar Singh took charge as the MD & CEO of Petronet LNG Limited.



Sh. JP Singh took the charge as MD in Green Gas Limited.

Japan’s Osaka Gas enters India’s urban gas distribution market:

Osaka Gas Co, Japan’s second-largest city gas supplier, announced in December 2021 that it had joined India’s urban gas distribution market by investing in the Indian business of Singapore-based AGP International Holdings (AG&P). The company along with its partners aims to invest up to US\$120 million in AG&P’s Indian unit.

ISGF & NGS jointly launched India City Gas Distribution Forum:

India Smart Grid Forum (ISGF) & Natural Gas Society (NGS) have jointly promoted India CGD

Forum to create a collaboration platform between the CGD companies & electricity distribution companies (DISCOMs). The idea is to share the assets, both physical & digital since there are many similarities between the work of electricity & gas distribution companies.

City gas grid to get Rs 5,000 crore in six southern districts of Bengal:

Bengal Gas Company Ltd, a joint venture between GAIL & Greater Calcutta Gas Supply Corporation Ltd, would plough Rs 5,000 crore over the next five years into a CGD network in six southern districts of Bengal, including Kolkata.

MRPL pact with Adani Gas for CNG stations:

Mangalore Refinery & Petrochemicals Ltd (MRPL) signed an MoU with Indian Oil Adani Gas Pvt Ltd (IOAGPL) for setting up of CNG stations in northern Kerala & Karnataka.

Torrent Gas began gas supply in Gorakhpur, UP:

Torrent Gas with presence in 15 districts across Uttar Pradesh plans a further investment of Rs 3,300 crore in the state by FY26. The company inaugurated the



Gujarat: Natural gas supply goes 'virtual' in tribal areas:

Gujarat Gas began supplying natural gas to consumers in the tribal areas of Narmada district. This is for the first time in the country where this new system is used in a tribal belt.



Ashvath: India's first CNG mobile refueling unit mounted on a truck:

Uttam Group of Companies in partnership with Mahanagar Gas Limited, launched 'Ashvath', the first mobile compact CNG filling station mounted on a moving truck.

Phase 1 of Gorakhpur CGD network and began gas supply in the area.

Confidence Petroleum bags contract for setting up CNG-MRU:

Confidence Petroleum India bagged a contract for setting-up CNG MRUs from Aavantika Gas, the first MRU for doorstep distribution of CNG fuel in Indore, Gwalior & Ujjain on built & operate basis.

Punjab's first bio-CNG plant starts paddy straw collection:

Punjab's first stubble-based bio-CNG plant collected around 10,000 MT of paddy straw for their operations to produce biogas. The plant is one of the largest CBG plants that would produce more than 33 tonnes of CBG or bio-CNG per day.

BBMP (Bengaluru) signs pact with GAIL for biogas supply:

The Bruhat Bengaluru Mahanagara Palike (BBMP) signed an MoU with GAIL, that will give the company around 300 tonnes per day (TPD) of organic waste to generate compressed biogas (CBG).



Policy Matters/Gas Pricing/Others

India increases domestic production of gas in 2021:

India's natural gas production increased by 22.7% YoY in April 2021, as Reliance Industries and its partner, BP increased production in the KG-D6 block on the east coast.

OIL discovers thermogenic gas reserve in Meghalaya's East Khasi Hills:

Oil India Limited (OIL) found a thermogenic gas reserve with high methane content in Umphniang village, near Dholai, Dangs in Meghalaya's East Khasi Hills District.

Kochi-Mangaluru Natural Gas Pipeline was inaugurated during the year:

The event marked an important milestone towards the creation of 'One Nation One Gas Grid'.

ONGC floats subsidiary to buy its own gas:

ONGC formed a new subsidiary for gas business to bid & buy gas from the firm's own fields. The government fixed a price of USD 1.79 per MMBtu for ONGC's fields.

MEIL makes India's first hydraulic rigs:

Megha Engineering & Infrastructures Limited (MEIL) announced that India's first rigs designed with advanced hydraulic technology began operations in the Kalol oil field near Ahmedabad, Gujarat. The rigs made with 1,500 HP capacity can easily drill upto depth of 4,000m from the surface.



Policy Matters/ Gas Pricing/ Others

Draft LNG Policy circulated:

Ministry of Petroleum and Natural Gas prepared a draft LNG policy and circulated it in 2021. The policy aims to set up a framework for the promotion of gas and find ways for LNG adoption in sectors that currently does not use it as a fuel. To make LNG the fuel of the future for heavy transport, the policy targets to convert 10% of long-haul heavy-duty trucks to ply on LNG. The timeline to achieve the target has not been specified in the draft document. The policy aims

to create LNG terminals with more than 100 million tonnes per annum (MTPA) along the coastal regions. The policy also aims to create 70 MTPA of regasification terminals by 2030 and 100 MTPA by 2040.

100% FDI allowed in oil and gas:

In July 2021, the government allowed 100% Foreign Direct Investment under automatic route for oil & gas PSUs.

The Commission for Air Quality Management (CAQM) issued directions to Delhi, Haryana, Uttar Pradesh & Rajasthan in August to make industrial units in NCR switch to a cleaner fuel like PNG. Only Rajasthan has given an action plan to comply with the CAQM directive, Uttar Pradesh & Haryana have not provided any such timeline.



India's sixth licensing round for 21 blocks launched:

Under the sixth licensing round, ONGC bid for 16 blocks & OIL was the only bidder in the two areas it sought for and the Sun Petrochemicals bade for the three blocks.

Delhi approves policy for allotment of CNG station sites:

The Delhi Development Authority (DDA) approved a policy for e-auction of CNG station sites, under which it would allow sites to individuals or gas distribution companies. This has been done to bring transparency & increase efficiency in the process of allotment of CNG station sites' plots.

Draft access code circulated:

PNGRB also floated a draft access code for common carrier or contract carrier natural gas pipelines in June 2021 as the government has been keen on allowing open access to CGD pipelines in order to increase the competition in the market.

Investments Plans for Gas sector

- Government plans to invest US\$2.86 billion in the upstream oil and gas production to double natural gas production to 60 Billion Cubic Metres and drill more than 120 exploration wells by 2022.
- ONGC plans to spend Rs. 300 billion (US\$4.03 billion) in FY22 to boost the oil & gas output.
- Government approved oil and gas projects worth Rs. 1 lakh crore (US\$13.46 billion) in northeast India in September 2021.
- Government plans to set up around 5,000 compressed biogas (CBG) plants by 2023.

**LNG
Development/
Contracts/
Utilisation**

Kolkata inks Kukrahati LNG Terminal deal:

The Syama Prasad Mookerjee Port (SMP), Kolkata, signed an MoU with the Hiranandani Group of Companies in February for a jetty-based LNG Terminal along the River Hooghly at Kukrahati in East Midnapore. The total project cost is about Rs 3,900 crore with an economic value of about Rs 6,000 crore.

Gazprom ships first LNG to India via Northern Sea Route:

Russia's Gazprom's Marshal Vasilevskiy vessel passed through the Northern Sea Route (NSR) with a cargo of LNG for the first time ever under long-term contract with GAIL.

Total signs deal to supply LNG to ArcelorMittal's plants in Gujarat:

French energy giant Total signed a deal to import LNG to ArcelorMittal Nippon Steel's (AMNS) steel & power plants in Gujarat. Total would supply up to 0.5 million tonnes of LNG per year until 2026.

India's 1st Floating LNG Storage and Regasification Unit arrives in Maharashtra:

The FSRU arrived at H-Energy's Jaigarh terminal in Maharashtra. Meanwhile, H-Energy also inked MoU for long-term supply of regasified LNG to Petrobangla, Bangladesh through a cross-border natural gas pipeline.





L&T secures LNG tank order for Dahej LNG project:

L&T Hydrocarbon Engineering (LTHE) secured an order from Petronet LNG for commissioning of

two LNG storage tanks with a capacity of 170 000 m3 each for the Dahej Expansion Project in Dahej, Gujarat, India.

Coal India to replace diesel with LNG in earth movers:

Coal India Ltd has begun the process of retrofitting LNG kits in its dumpers - big trucks engaged in transportation of coal in mines.

KSRTC to ply LNG buses for inter-city operations: In a bid to reduce the dependence on costly diesel, Kerala State Road Transport Corporation started its first bus service that runs on LNG. The buses will run in Thiruvananthapuram-Ernakulam & Ernakulam-Kozhikode routes.

Electric Mobility/ Hydrogen/Bio- Methane/Others

India extends FAME scheme by two years:

The Faster Adoption & Manufacturing of Hybrid & Electric vehicle (FAME) scheme has been extended by two years to March 31, 2024. The scheme, started in 2019 for promoting sales of electric vehicles, was supposed to end by 2022.



Costly fuel pushes up demand for more EV charging stations on highways:

Bangalore Electricity Supply Company (Bescm) installed charging stations in Bengaluru & has so far installed 136 charging units at 74 locations in the city. Bescm's plan is to have a charging station for every 5 km in the city.

TVS Supply Chain Solutions, Switch Mobility to operate 1,000 electric LCVs:

TVS supply chain solution (TVS SCS) tied up with Ashok Leyland subsidiary switch mobility to establish a 'sustainable logistic network'. Under the arrangement, TVS SCS will operate 1,000 electric light commercial vehicles provided by the switch.

Greaves Electric Mobility launches its largest EV plant in Tamil Nadu:

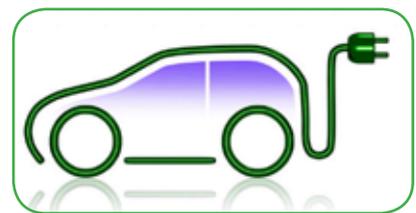
The largest e-vehicle production facility located in Ranipet, which is part of the Rs 700 crore investment roadmap laid by Greaves Electric Mobility was inaugurated.

IndianOil to build India's first green hydrogen plant at Mathura Refinery:

Indian Oil Corporation (IOC) announced in July to establish India's first green hydrogen plant at Mathura refinery to introduce green hydrogen activities and projects in oil and gas sector in the country.

Odisha Government announced Odisha Electric Vehicle Policy:

Under the policy guideline, the state government proposed to extend in-



centives for both consumers and manufacturers in an attempt to boost demand and manufacturing for EV vehicles. It will completely exempt motor vehicle (MV) tax and registration fees for electric vehicles and the exemption will be applicable during the whole period of the state's EV policy, till December 31, 2025.

Gujarat CM launches 50 JBM electric air-conditioned buses in Ahmedabad:

Former Chief Minister of Gujarat Vijay Rupani launched 50 JBM ECO-LIFE electric buses, the first batch, out of a total of 180 buses that JBM Auto will be supplying to Ahmedabad city.



Government approved Production Linked Incentive (PLI) scheme for manufacturing of Advanced Chemistry Cell (ACC) to bring down prices of battery in the country:

The PLI plan for Automobile and Auto Components, which was authorised with a budgeted allocation of Rs 25,938 crore (US\$ 3.43 Billion) for a five-year term, covers electric vehicles. The GST on electric vehicle chargers/charging stations has been reduced from 18% to 5%. The Ministry of Road Transport & Highways (MoRTH) announced that battery-operated vehicles will be given green license plates and be exempted from permit requirements. MoRTH also issued a notification advising states to waive road tax on EVs, which in turn will help reduce the initial cost of EVs.

Gujarat too announces new EV policy:

Gujarat government in June announced its new EV promotion policy with the most generous subsidy roll out on the purchase of EVs announced by any state so far. The



subsidy works out to about Rs 29,000 for the Ather 450, Rs 20,000 for the Hero Electric Optima, and as much as Rs 3 lakh for the Tata Nexon EV.

Maharashtra announces new EV policy:

The Maharashtra Government in July announced a new EV promotion policy that provides subsidies to buyers to drive up demand for EVs in the state. The Maharashtra EV Policy 2021 provided incentives of Rs 5,000 per kilowatt-hour of battery capacity to buyers of all types of electric vehicles. The subsidy will be directly transferred to the beneficiaries within 30 days. The scheme is valid till 31 March 2025 and by then aims to convert 10% of all new vehicles sold in the state to electric. It also aims to convert 25% of all last-mile logistics vehicles to electric. The policy also includes waiver of road tax and registration charges for vehicles sold under the policy.

Swiggy inks pact with RBML to build EV ecosystem in India:

Swiggy, a food ordering and delivery platform, formed an agreement with Reliance BP Mobility Ltd. (RBML) to develop an electric vehicle ecosystem and battery-swapping stations for its delivery partners across India. Making deliveries using EVs is expected to reduce vehicle operating costs by up to 40%.



Natural Gas/ Transnational Pipelines

Energy-starved Bangladesh discovers new gas field worth over \$148mn:

The field discovered by state-run Bangladesh Petroleum Exploration Company (BAPEX) in Sylhet region contains a probable reserve of about 68 billion cubic feet worth over USD 148 million.

Egypt constructs gas pipeline in Western Desert:

Egypt reportedly commenced the construction of a gas pipeline in October with an estimated capacity of 15 million cubic feet of gas per day in the Western Desert. According to the state's Ministry of Petroleum & Mineral Resources, it would drill a total of 23 new wells across both seas & would have reached a total of 12 agreements.

China bets on natural gas for clean transport:

The Chinese government said in October that the use of natural gas in the transportation sector was one of its focal points in the energy transition. The government issued a white paper titled "Responding to Climate Change: China's Policies & Actions" outlining measures it would take to green its economy.

Romania: OMV Petrom launches gas sales platform: The Romanian arm of Austria's OMV, OMV Petrom is establishing a new digital platform for gas sales to small- & medium-sized enterprises, consolidating its position in the Romanian gas market. In another move to expand its gas business, the company has secured a licence to commercialize LNG in Romania.

Natural Gas/ LNG Utilization/ Biomethane

Norway's Norsk Hydro to buy LNG for Brazil plant:

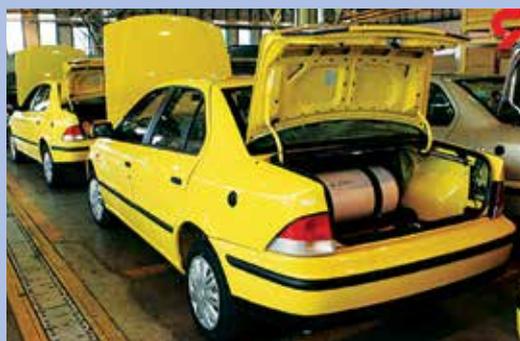
Norwegian metals maker Norsk Hydro made a 15-year deal with New Fortress Energy to buy LNG for its Alunorte alumina refinery in Brazil, switching from fuel oil.

Spain: HAM pioneers project to develop & sell biomethane for vehicles:



HAM Group developed the first 100% biomethane for vehicles project in Spain, which would allow

customers to enjoy biofuel at the company's service stations.



Iran - Over 130,000 public transport vehicles to become dual-fuel:

Around 132,000 public transport vehicles became dual-fuelled across Iran under a CNG program launched in May 2020. Iran's CNG consumption was 19 mmscmd before the implementation of the fuel rationing scheme & has now reached 21 mmscmd.



Finland: Finnish government supports growth of biomethane as vehicle fuel:

Gasum's new biogas plant has been opened in Munkkaa, Lohja. The new facility would process around 60,000 tons of biodegradable waste from the Helsinki region each year to produce 40 GWh of biomethane to be used as transport fuel. Gasum now has a total of 17 biogas plants in Finland & Sweden & is one of the largest biogas producers in the Nordic countries.

UK: Gasrec expands biomethane refueling infrastructure:

Gasrec completed the acquisition of 5 bio-LNG refuelling stations & 4 cryogenic trailers, following the withdrawal of another supplier in the UK LNG road transport market.

UTA now operates the largest LNG refuelling network in Europe:

Eight LNG filling stations of the Berlin-based station operator have been added to the UTA acceptance network in Germany. With



this, UTA's LNG refuelling infrastructure has grown to almost 170 service stations in 10 countries, making it currently the largest LNG network in Europe.

Global LNG Development/ Contracts/ Shipping

China becomes the world's largest LNG market:

China replaced Japan to become the world's largest consumer in the LNG market. Asian LNG demand firmly returned to growth in the first five months of 2021, with China the single biggest contributor. China imported more than 7 Mt of LNG that month, up 35% year-on-year.

Qatar orders new vessels for LNG expansion:

Qatar's state-owned Qatar Petroleum has ordered four new LNG carriers from China's Hudong Zhonghua shipyard, the first of several batches planned as part of a massive shipbuilding program to handle its coming gas capacity expansion. The order is worth more than \$770mn. Separately, Qatar Petroleum signed a 10-year sales & purchase agreement in June

with Shell to supply 1mn metric tons/year of LNG to China. Meanwhile, Qatar Gas Company has started with its \$29 billion project to build four new natural gas production lines in the city of Ras Laffan. It plans to increase LNG production capacity to 110 million tons per year from 77 million tons. Production is expected to start by the end of 2025, & total daily output is expected to hit around 1.4 million barrels of oil equivalent per day.

LNG exports to China reach record high:

For the first time, China became Australia's largest customer of LNG. Shipments to China jumped 7.3% to 30.7 million tonnes in the year. The trade with China contributed to a record 72.4 million tonnes of LNG exports by Australia to North Asia in 2020-21. It was worth about \$15.6 billion.

Australia: Regulator orders Shell's Prelude LNG to shut down:

Australia's National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) ordered Shell in December, to keep its massive Prelude LNG offshore gas facility shut down until it can prove that it has made safety improvements after a small fire in an electrical compartment knocked Prelude's power supply offline in November, forcing a shutdown and a rush to get generators back up and



running. According to NOPSEMA, that restart effort failed repeatedly, and Prelude's power kept shutting down for three days. Shell has not yet shown an ability to manage such a complex asset.



Thailand: Egat allocates 20bn baht for LNG terminal:

Thailand's state-run Electricity Generating Authority of Thailand (Egat) joined hands with national oil & gas company PTT to co-invest in a second LNG receiving terminal with a capacity of 7.5 million tonnes per year in Rayong as part of new gas supply management.



Vietnam: Stena tests jettyless LNG terminal:

Swedish shipbuilder Stena Power & LNG solutions completed the successful testing of a jettyless LNG terminal off the coast of Vietnam for Delta Offshore Energy's LNG-to-power facility in October.

Sardina Island: Air Liquide technology implemented at coast LNG depot:

Sardinia's first LNG storage facility is now complete & it features Air Liquide's Turbo-Brayton cryogenic technology.



Canada: Cheniere LNG inks 15-year gas supply deal with Tourmaline:

Corpus Christi Liquefaction Stage III, LLC, a subsidiary of Cheniere, signed an agreement with Tourmaline Oil Marketing Corp., a unit of Tourmaline Oil Corp, Canada's largest natural gas producer in July according to which Tourmaline would supply 140,000 MMBtu per day of natural gas.

US: Tellurian signs two 10-year LNG agreements for 3 MTPA each:

US LNG developer Tellurian Inc signed two 10-year, 3-MTPA agreements, one with commodity trader Vitol & the other one with commodity trader Gunvor Group. Each deal is worth about \$12 billion in revenue over the contract period.

Germany: New alliance encourages expansion of German bio-LNG fuelling network:

Liquid 24/7 & EnviTec Biogas signed an agreement for the sale of bio-LNG, being produced at a new liquefaction plant in Güstrow, Germany. Starting in autumn 2022 Liquid would be in charge of obtaining the bio-LNG, organizing its transport & distribution to heavy-duty customers at its truck fuelling stations in Germany.



Croatia: Floating LNG terminal on Krk becomes operational:

Funded by the European Union, the capacity of the terminal at 2.6 billion cubic metres per annum has been sold out for the next three years. The terminal could strengthen the European energy market & increase the security of gas supply to EU countries.

LNG as a Marine Fuel

Russia to build its first LNG-fuelled icebreaker:

Metals miner Nornickel would participate in the design & building of Russia's first dual-fuel LNG &



diesel icebreaker to prepare for more capacity in the environmentally sensitive Arctic region. Russia has long considered LNG-powered icebreaking ships to develop the Northeast Sea Route into an international shipping lane from Arctic waste.

Japan: Sumitomo, Petronas partner on LNG bunkering:

Japanese trading house Sumitomo & Malaysia's state-owned oil firm Petronas signed an initial deal to jointly market & supply LNG as a bunker fuel in Tokyo bay in Japan & Malaysia. Separately, Mitsui O.S.K. Lines (MOL) signed a long-term contract with JFE Steel Corporation for long-term transport using an LNG-fuelled bulk carrier. Under MOL's operation, the vessel would provide reliable, long-term supply of cargos in Japan.

Singapore: Pavilion Energy imports carbon-neutral LNG cargo:

Carbon emissions associated with the LNG cargo from well to tank - including the extraction, production, transportation, & regasification - will be offset by retiring a corresponding amount of carbon credits sourced from the company's portfolio of carbon offset projects.

Taiwan: ENI sent carbon-neutral LNG to Taiwan:

ENI delivered carbon-neutral LNG from the Bontang terminal in Indonesia to CPC Corp in Taiwan via the Yung Ang receiving terminal on the island.

South Korea: Samsung Heavy Industries grabs \$710 mn LNG-fuelled container ship order:

South Korea's Samsung Heavy Industries Co. has bagged a 781 billion won (\$710 million) order to build five container vessels powered by LNG for a Hong Kong-based shipping company.



Technological Development for Cleaner and Greener Environment/ Electric Mobility/ Hydrogen

Saudi Arabia: Saudi to use \$110 billion natural gas project for blue hydrogen:

Saudi Arabia said a key focus of one of the world's biggest natural-gas projects would be on manufacturing blue hydrogen. A large portion of gas from the \$110bn Jafurah development would be used for blue hydrogen. The fuel is made by converting

natural gas & capturing the carbon dioxide emissions. France: French firms explore bio methane and boiling: French shipping & logistics company CMA CGM & French Energy Company ENGIE in November agreed to collaborate on ways to produce & distribute synthetic methane as well as bio-LNG. The French companies said they established a long-term partnership to support the development of methane for the shipping industry.



India, Italy to collaborate on green hydrogen, gas sector:

India & Italy agreed to explore development of green hydrogen, setting up renewable energy corridors, and joint projects in the natural gas sector as the two nations sought to strengthen partnership in the energy transition. A joint statement was issued after Prime Minister Narendra Modi held the first in-person meeting with his Italian counterpart Mario Draghi on the sidelines of the G20 Summit in Rome in October, the two leaders agreed to encourage joint investments of Indian and Italian companies in energy transition-related fields.

Norway to begin operating two \$24 million hydrogen fuel cell cargo vessels:

A year ago in 2020, the Wilhelmsen maritime group was awarded major funding by the Norwegian state, for the construction of its pioneering zero-emissions hydrogen vessels. Now, the EFTA Surveillance Authority (ESA) has approved the state aid, which means that the Topeka project has the green light to keep going. This is no ordinary project either, but one that hopes to transform Norway into a global hub for maritime hydrogen. They would be powered by hydrogen fuel cells, plus a 1,000 kWh battery, so that they could provide zero-emissions transportation.



Namibia eyeing emerging market for green hydrogen:

Namibia is positioning itself as a leader in the emerging market for green hydrogen and has already put up to \$45.3 million from Germany to use on feasibility studies and pilot projects related to green hydrogen. Several global players expressed interest after Namibia's government put out a request for

Scania launches new 13-litre natural gas engine:

Scania, a global OEM focused on heavy-duty transportation applications, has developed an all-new 13-litre



natural gas engine that can run on either CNG (including biogas) or LNG, along with new on-board CNG & LNG tank options. The new engine is currently available as an option on the recently introduced high-floor Scania K-chassis for coach buses.

proposals to develop two separate but adjacent sites, where it envisions massive desalination plants.

US government grants \$1bn for Nebraska hydrogen project:

The US Department of Energy guaranteed a \$1 billion conditional loan for a Nebraska based hydrogen project. The loan is the first of its kind to go to a non-nuclear project since 2016. It will convert natural gas into hydrogen. The loan signifies the reinforcement of the department, which plans to use over \$40 billion in loan authority to pave the way for clean-energy technologies.

US - United Airlines inked a deal for battery-powered electric aircraft through its new United Airlines Ventures investment fund, in collaboration with Breakthrough Energy Ventures, Mesa Airlines, and Heart Aerospace. The agreement calls for Heart to deliver 100 of its 19-passenger ES-19 battery-electric aircraft, which will have a range of up to 250 miles.



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