IN IT FOR THE LONG-HAUL

Jon Ackerman from Vopak Moda Houston tells *Tank Storage Magazine* about the first greenfield terminal in the Port of Houston in more than a decade

IN DECEMBER 2021, Vopak Moda Houston, a terminal in the Port of Houston, US, announced that it was fully operational. But this was not any old terminal. Vopak Moda Houston was the first greenfield terminal developed in the Port for more than ten years, built to handle anhydrous ammonia and speciality pressurised gases.

The terminal is operated as a joint venture, set up in 2016 between Vopak and Moda Midstream. Moda Midstream was at the time barely a year old, having been set up in early 2015 with equity backing of US$750 million from EnCap Flatrock Midstream and the Moda management team. Including efforts at Moda and prior experience at Oiltanking, the management team has owned and developed almost US$10 billion (€10 billion) in liquid storage assets along the Gulf Coast.

'The joint venture brings together Moda's development expertise and market knowledge with Royal Vopak's more than 400 years of history to establish flagship infrastructure in the Houston Ship Channel. We are particularly proud to have developed the terminal here in Houston, our hometown and one of the most important markets in our industry,' says co-founder and CEO of Moda Midstream Jon Ackerman.

STATE-OF-THE-ART

Vopak Moda Houston is the only ammonia terminal on the Houston Ship Channel. It has two 15,000 tonne tanks for refrigerated ammonia storage and five pressurised bullet tanks with a total capacity of 14,285 bbl for the speciality gas stream. The waterfront has deepwater vessel and barge berths. The terminal has a marine parcel and an inland parcel and is adjacent to key ammonia, hydrogen and nitrogen pipeline corridors in the Houston Ship Channel industrial and petrochemical complex. Ammonia is received by vessel and barge before being stored in the tanks, and can be delivered directly to the petrochemical complex via pipelines. Speciality gas products arrive on the terminal's rail loop, which is served by all three main rail lines in the Port – Union Pacific, BNSF, and Kansas City Southern. This can be delivered directly to a nearby facility connected by pipeline.

Ackerman says that the terminal is 'exceptional in several aspects.' The terminal was designed and built with best-in-class technologies that prioritised its resilience for the future. It has access to the deepest draught on the Houston Ship Channel and is situated to the east of the Beltway 8 bridge, meaning it is away from the shallower water, vessel restrictions and congestion found to the west of the bridge.

'Because of its location and dock construction, Vopak Moda Houston is also the only ammonia facility that is designed to handle very large gas carriers (VLGCs). We expect that VLGCs will be increasingly used to transport green and blue ammonia to Asia and Europe. A VLGC can handle around 55,000 tonnes of ammonia. This capability will be particularly important for long-haul movements of low-carbon ammonia to new markets in Asia and Europe,' says Ackerman.

Vopak Moda Houston has state-of-the-art safety equipment, including fire suppression infrastructure with built-in redundancy and marine loading arms with emergency release systems for safe operation.

The terminal sits on land with a total area of 130 acres and Ackerman says that the existing infrastructure uses only a small part of the total acreage.

'There is substantial undeveloped land for additional expansion. Although there is a scarcity of real estate in the Houston Ship Channel area, there's ample space for Vopak and Moda to develop more refrigerated storage tanks and infrastructure at the site – in fact, we've already begun permitting activities to add additional tankage. Further expansions of the ammonia handling are ready to go, as Vopak Moda Houston already has existing operations and a dedicated, experienced team,' he says.

FOR THE ENERGY TRANSITION

Moda Midstream was one of the first private midstream and terminal companies in the US to publish a sustainability report, which along with its health, safety, security and environmental policy, is available publicly on its website. With the growing interest in ammonia for the energy transition, both as a fuel in itself and as a hydrogen carrier, Vopak Moda Houston plays into Moda's strategy.

'Moda is committed to building a sustainable business that is safe, reliable and incorporates best practices and processes for environmental, social and governance (ESG) excellence. We take pride in our ESG practices,' says Ackerman.

The terminal's customers are pushing this ambition further still.

'We are now seeing the twin motivations of energy security and the energy transition drive customer interest in storage and handling of lower-carbon products,' Ackerman says. 'We are


01

actively developing low-carbon import and export opportunities at the Vopak Moda Houston terminal.'

This includes the storage and handling of green and blue ammonia, for which Moda sees new markets both domestically and overseas, for power generation, ship bunkering, industrial and green steel markets, beyond the conventional petrochemical and fertiliser markets.

'In addition, ammonia has generated substantial interest as a long-haul energy carrier molecule for global sustainable energy supply chains. The nascent hydrogen economy will be limited by the challenges to store and transport pure hydrogen. Ammonia's advantaged chemical characteristics, such as energy density and liquefaction point, present an attractive energy carrier solution. Ammonia can by synthesised, transported, stored, and cracked when needed to produce hydrogen,' says Ackerman.

He believes the Houston area is ideally placed to become a major player in low-carbon ammonia and support development of a low-carbon ammonia market centre, including the chemical and industrial infrastructure supporting demand, CO_2 pipelines with nearby geology suitable for sequestration and the availability of cheap natural gas for production.

'Our ambition is to become a hub for ammonia trading, including the lower carbon varieties. We believe that Houston will be a key ammonia trading market similar to Henry Hub for natural gas, or Cushing for crude oil, which will provide customers significant trading liquidity,' says Ackerman.

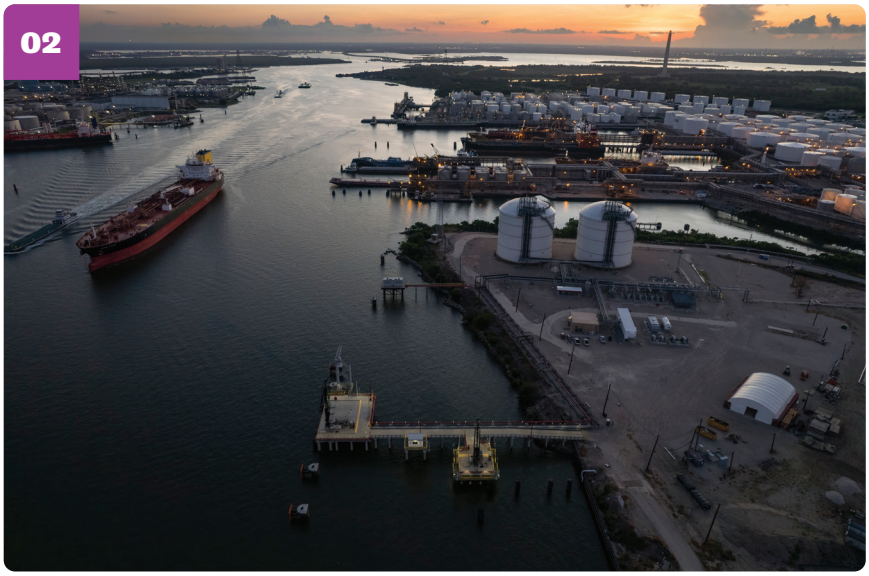
As well as seeking to become an ammonia hub, Vopak Moda Houston is actively investigating other low carbon bunkering options, for fuels such as responsibly sourced LNG and renewable LNG from landfills and farms.

KEEPING TRACK OF GLOBAL TRENDS

Ackerman says that a number of macroeconomic trends are affecting the global terminals industry beyond the looming energy transition, including residual effects from the COVID-19 pandemic, Russia's war on Ukraine and ongoing supply chain problems, but he is positive about the future.

'Against a backdrop of volatile global energy markets, we continue to believe that Gulf Coast marine terminals will play an integral role in balancing global supply and demand,' he says.

He sees three main specific trends affecting the tanks and terminals industry. Firstly, customers are increasingly looking



for more resilient supply chains with multiple avenues to get their products to market, which means modern terminals need greater flexibility and optionality, with multiple modes for product movement and more buffer storage.

The second trend is for more automation and data analytics. Vopak Moda Houston uses Vopak's MyService terminal management system to provide real-time operational data and insights.

The third trend is the continual demand for lower emissions and sustainable practices.

'Customers are increasingly focussed on their scope 1, 2 and 3 emissions. We expect that terminals will be able to differentiate on the ability to reduce or minimise emissions. Over time, the technology to manage emissions will become more and more advanced, which will allow Moda's terminals and other terminalling operations across the industry to achieve even greater emissions reductions,' says Ackerman.

He adds that the terminal is currently analysing how to reduce emissions for current and future operations, including baseload and backup power and utilities sources.

'We expect to continue to grow the terminal to make it a key link in the global supply chain for the products it handles,' says Ackerman. 'Current expansion projects include additional ammonia storage and handling infrastructure. Longer term, Vopak Moda Houston looks to be an important part of the supply chain for liquids products.'

TEAM SPIRIT

No terminal could function without a good group of employees to run it.

'We hire the best and foster an inclusive, collaborative environment where everyone can flourish. Regarding workforce diversity, we are committed to a diverse workplace where employees feel valued and know their contributions are appropriately recognised. We believe employing people with different backgrounds, experiences and perspectives makes Moda a stronger business,' says Ackerman. 'One area, in particular, where we have been proud of our achievements is in hiring veterans of the US armed forces.'

And the recruitment tactics have paid off. Ackerman is very pleased with what everyone at Vopak Moda Houston has achieved so far, including operating the terminal in a safe and reliable manner, and building a culture that rewards problem solving.

'What I am most proud of at Vopak Moda Houston is the team we have assembled. We have recruited a deep, diverse and experienced team across management, operations, safety, commercial and project development. Team members have come from supermajors, independent energy companies and large terminalling companies. These talented team members have come to a company that has been built from the ground up with excitement and drive to create a meaningful and enduring business. The team has laid the foundation to become a key hub for the products we handle.'

For more information:

www.modamidstream.com/terminals/vopak-moda-houston

01 Tank mound and pipe headers

02 Vopak Moda Houston