HYDROGEN + AMMONIA
ENGINEERING & CONSTRUCTION

Hydrogen & Ammonia Whitepaper:

Challenges and opportunities in hydrogen, ammonia engineering and construction

Plus Comprehensive Hydrogen & Ammonia Project Tracker

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Introduction

The clean hydrogen industry – and the clean ammonia industry alongside it – continues to develop. According to the International Energy Agency's (IEA) Global Hydrogen Review 2024, published in October, production capacity on which final investment decisions (FIDs) had been taken had doubled year on year to reach 3.4mn tonnes per annum (mtpa). This represents a fivefold increase on current production by 2030 and is split roughly evenly between green hydrogen, produced via electrolysis using power from renewable sources, at 1.9 mtpa, and blue hydrogen, produced from natural gas requiring carbon capture and storage (CCS), at 1.5 mtpa.

Clean ammonia projects have gained momentum alongside low-carbon hydrogen projects.

"Ammonia has gained attention for its potential role as a hydrogen carrier and as a clean fuel, especially for sectors like maritime shipping, where its energy density makes it an attractive alternative fuel," professional services firm GHD's senior technical director for future fuels, Hassan Modarresi, said.

The IEA cautioned, however, that while low-emissions hydrogen had seen "noteworthy" progress for a nascent industry over the past year, most of the potential production was still in planning or at even stages. This was echoed by an analyst at emerging technologies research firm IDTechEx, commenting on green hydrogen progress in particular.

"Out of the 600GW or so electrolyzer project capacity that has been announced globally, the vast majority is still in the concept and feasibility study stages," the IDTechEx analyst said. "Only around 13GW is at the FID and construction stages."

The progress made thus far – both on a global basis and specifically in the US, where the Gulf Coast in particular is emerging as a low-carbon hydrogen hub – is nonetheless still significant.

"Overall, the US has made meaningful progress in advancing clean hydrogen and ammonia projects, with both the private sector and government initiatives," Modarresi said. He cited examples of projects that have moved forward including Plug Power's electrolyzer manufacturing plant and CF Industries' ammonia production facility in Louisiana.

However, developers have no time to waste if they are to meet a national target of scaling up clean hydrogen production in the US to 10 mtpa by 2030, 20 mtpa by 2040 and 50 mtpa by 2050. And there are various challenges that will need to be overcome in order for the low-carbon hydrogen and ammonia industry to reach its full potential.

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Regulatory and policy landscape

One key government initiative highlighted by Modarresi is the advancing development of clean hydrogen hubs by the administration of US President Joe Biden as part of an $8 billion initiative, which aims to foster innovation in hydrogen and ammonia production and use.

On top of this, there are tax credits that will be on offer to producers of low-carbon hydrogen under the Inflation Reduction Act (IRA).

"The IRA will be important for improving the economic viability of electrolytic/green hydrogen projects, offering a subsidy for low carbon hydrogen (green or blue), and therefore making the US attractive for investment," said the IDTechEx analyst.

However, Modarresi attributed slower-than-expected progress for new projects in reaching FID primarily to uncertainty surrounding the US guidelines for tax credits under the IRA. He suggested, for example, that ExxonMobil could be holding off on an FID on its blue hydrogen project at its Baytown refining and petrochemical facility in Texas in part because of unclear IRA guidelines.

"The delayed finalization of key tax credit regulations, particularly for hydrogen production, has created hesitation among investors and developers," Modarresi said. "This lack of clarity has delayed decision-making for many large-scale projects."

The Internal Revenue Service (IRS) is currently working to finalize the 45V guidance by the end of 2024, which is expected to provide much-needed clarity on what projects will qualify for the tax credits.

"The key issues involve unclear definitions of 'clean hydrogen', especially regarding carbon intensity thresholds and lifecycle emissions calculations," Modarresi said. In his view, the stringent requirements in the proposed guidance can complicate compliance.

This was echoed by the IDTechEx analyst, who noted that requirements relating to lifecycle emissions could make it difficult for electrolyzers relying on an average US grid mixes to capture the value of the tax credits. "Accurately calculating the emissions from electrolyzer operation will itself likely be challenging and require clear guidance on accounting practices," the IDTechEx analyst said.

On top of current uncertainty over what the final requirements under the IRA will look like, the US presidential election in November represents a further unknown. The outcome of the election could result in a change of the levels of government support on offer to the nascent low-carbon hydrogen industry.

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Technology readiness and scale

Industry calls for financial support from the government are closely tied to maturing the available technologies and making them scalable. Various technologies relating to low-carbon hydrogen and ammonia are at different levels of maturity, so some – notably when it comes to green hydrogen – have a longer way to go.

"The commercial readiness and scalability of green hydrogen technology are improving but still face challenges," said Modarresi. "Electrolyzer technology has made significant improvement with costs dropping due to advancements in efficiency and manufacturing. However, current electrolyzers are still expensive and require substantial renewable energy inputs. Currently, the total cost of a green hydrogen plant exceeds $1,500 per kW, significantly higher than below $1,000 per kW perceived by many project developers."

Within the sphere of green hydrogen production, there are different types of electrolyzer technologies, including polymer electrolyte membrane (PEM) and anion exchange membrane (AEM) electrolysis, as well as solid oxide electrolysis cell (SOEC) technology.

"Alkaline electrolyzers (and to a lesser extent PEM) are commercial and relatively mature technologies in 2024, but there has been limited demonstration of large, hundred-MW to GW-scale electrolyzer projects, adding risk to many of the larger projects that have been announced over the past few years," said the IDTechEx analyst. "In addition, manufacturing capacity outside of China does remain comparatively limited and so we do expect some cost savings to become available alongside increasing scale and know-how along the electrolyzer supply chain and industry," the analyst continued. "Technological innovations are also ongoing and likely to play a role in reducing capital costs, particularly for PEM electrolyzers, as well as SOEC and AEM-type systems."

The analyst added that it was important to note that capital cost was only one aspect of producing cost-effective electrolytic hydrogen.

"The availability – and ability – to use low-cost electricity is critical to producing low-cost green hydrogen," the analyst said.

For blue hydrogen production, there are also different technologies that are at varying levels of maturity, with some now considered mature.

"Pre-combustion carbon capture for blue hydrogen production is a mature, commercially viable technology," said Modarresi. "It is important to note that the latest blue hydrogen and ammonia technologies no longer rely on post-combustion carbon capture, which is still evolving and not at TRL [Technology Readiness Level] 9. Leading blue hydrogen and ammonia technology licensors – such as Topsoe, KBR and Air Liquide – predominantly offer auto-thermal reforming (ATR) processes integrated with pre-combustion carbon capture. These processes capture CO_2 before combustion, allowing for reliable and more efficient capture rates (>99%). These technologies have been proven in large-scale commercial plants for over two decades."

Modarresi went on to say that unlike green hydrogen technology, ammonia production technology has a high level of maturity, corresponding to TRL 9.

"This means the technology is fully developed, proven and commercially available at scale," he said. On top of this, global shipping networks and ammonia terminals are already in place, which make it a viable solution for long-distance energy transport, according to Modarresi. As the low-carbon hydrogen industry grows, this existing infrastructure presents opportunities for lower project costs and accelerated project timelines. Indeed, in a recent interview with the Energy Projects Conference, green technology company ACME USA's CEO, Daniel Dus, said existing ammonia infrastructure was one of the factors his company looks for when selecting a site for a hydrogen/ammonia project.

Economies of scale also present opportunities for lowering costs, but these, too, are uneven across the different technologies involved.

"As production scales up, economies of scale are expected to significantly reduce costs, particularly in areas like electrolyzer manufacturing, renewable power integration and CCS infrastructure," Modarresi said. However, he added that the impact of scaling is likely to be more pronounced for green ammonia and blue hydrogen/ammonia projects than for green hydrogen projects.

"This is because the modular nature of electrolyzers causes costs to scale more linearly with production capacity, limiting the extent of cost reductions as capacity increases," Modarresi said.

Additionally, challenges could arise from the domestic content requirement in the IRA.

"To benefit from the full tax credits under 45V, the IRA mandates that a portion of the project components, such as electrolyzers, must be sourced from US-based or qualifying international suppliers," Modarresi said. "This is a problem for developers considering cheaper Chinese electrolysers, as using equipment manufactured outside the allowed regions could disqualify them from receiving the maximum credit. Although Chinese electrolyzers are much cheaper and attractive from a cost perspective, relying on them could mean losing the tax incentives, which are crucial for making clean hydrogen economically viable."

Risk mitigation

An additional challenge for developers is the need to achieve robust warranty agreements and performance guarantees for mitigating project risks, given the relative newness of some of the technologies involved and the unknowns over their longer-term performance.

"Anecdotally, we have heard that while long lifetimes may be advertised in spec sheets by electrolyzer manufacturers, translating this into a contract has proven more difficult," the IDTechEx analyst said. "This probably does highlight the relatively early stage of large-scale electrolyzer system deployment, as well as the comparative lack of data on electrolyzer degradation under real usage patterns, especially if operated somewhat flexibly to capture periods of low-cost electricity or to follow renewable production output."

Modarresi agreed that original equipment manufacturers (OEMs) were still refining their systems to optimize for cost, efficiency and durability.

"This makes OEMs cautious in offering comprehensive warranties, especially when scaling up production for larger projects," he said. "Concerns around system longevity, maintenance costs, and variability in renewable power inputs (e.g., intermittent solar or wind energy) further complicate warranty agreements."

Warranties and performance guarantees are often based on historical data, Modarresi continued, but for large-scale electrolyzers or new types of electrolyzers, there are limited long-term operational data at scale.

"Without this data, OEMs struggle to provide confident guarantees," he said, and they may opt instead to offer limited warranties or conditional performance guarantees. "This puts more of the risk on developers and investors, who must then find other ways to manage these risks."

Options for mitigating this include the use of third-party insurance, implementing projects in phases and partnerships between developers and OEMs, through which both parties can share risks and rewards.

"In this model, OEMs might agree to more favorable warranty terms if developers offer co-development opportunities or future revenue-sharing based on project performance," said Modarresi.

Capital costs

On top of costs relating to emerging technologies and to power supply, there are other factors adding to the cost pressures for developers of low-carbon hydrogen. Indeed, this is a broader trend across different types of energy projects, including renewables and LNG, which have seen supply chains come under pressure in the US and elsewhere.

"Hydrogen and ammonia project developers face the same challenges of renewable energy projects – long development timelines, high capex and frequent delays in securing permitting," said the IDTechEx analyst. "Additional challenges are a still maturing market in terms of demand (willingness to offtake hydrogen), high capex for electrolyzers and expensive renewable electricity (can account for up to 80% of the total cost)."

This, the analyst noted, was on top of slow-moving regulation – and perhaps unsupportive regulation in certain cases – that could be seen as hindering development.

"Hydrogen and ammonia project developers are facing significant supply chain challenges (probably more than LNG projects), particularly when it comes to long lead times for critical infrastructure components such as high-voltage switch gears, transformers and compressors," said Modarresi. "These pieces of equipment are essential for large-scale green hydrogen and ammonia projects but are currently subject to global supply bottlenecks. The wait times for these components (> 2-3 years) can stretch project timelines and inflate costs, posing substantial hurdles for developers."

Modarresi views green hydrogen projects as being especially vulnerable to supply chain delays.

"The need for extensive grid upgrades and reliable, large-scale power conversion equipment exacerbates the situation, making it harder to meet project deadlines," he said. "While many large-scale electrolyzer production facilities have been announced globally, few have reached full-scale realization and investment. This limits the availability of electrolyzers, creating bottlenecks for green hydrogen and ammonia projects that rely on them for production. The slow ramp-up in manufacturing capacity has contributed to longer lead times, making it difficult for project developers to secure the necessary equipment within predictable timelines. This also increases cost uncertainty, as demand for electrolyzers continues to outpace supply."

By contrast, blue hydrogen and ammonia projects face fewer supply chain challenges as they typically use well-established technologies that are less dependent on the types of electrical equipment that are currently experiencing the most severe bottlenecks, according to Modarresi.

"Much of the necessary infrastructure for blue hydrogen production has been in place for decades, allowing for quicker project execution and lower exposure to current supply chain issues," Modarresi said. He added, however, that compressors used in blue projects could be vulnerable to supply chain pressures.

There are mitigation strategies that hydrogen and ammonia project developers can pursue. Modarresi highlighted steps including securing early procurement contracts and supplier diversification – though early procurement could be challenging ahead of FID, while developers seeking IRA tax credits may be limited in how much they can diversify their supplier network.

On top of this, policy support could make a difference to developers as they seek to optimize their supply chains.

"Encouraging domestic manufacturing of critical infrastructure components, or providing financial support for supply chain management, can alleviate some of the strain," Modarresi said.

Offtake agreements

Another important consideration for low-emissions hydrogen projects is offtake agreements. Indeed, according to a 2023 commentary from law firm Norton Rose Fulbright, it is the most important component of developing hydrogen projects as long-term hydrogen offtake agreements will likely be required to finance those projects. This is echoed by the IEA, which said in its 2024 report that owing to the absence of a hydrogen market, securing offtake with a suitable price point, for the entire capacity of a project and over the longest possible term, was the "most critical measure for addressing the volume and price risk".

There are various factors for developers and offtakers to consider when negotiating these agreements. One challenge is that there is no single dominant approach for pricing hydrogen on a global level. Against this backdrop, different offtake models have emerged, including index-linked, fixed price and volume-based agreements. Different models allow for different breakdowns of risk-sharing, and what model is likely to be negotiated depends on various project-specific circumstances.

Complicating this further still is the uncertainty over what long-term demand for low-carbon hydrogen will look like.

Modarresi said that while his exposure to offtake agreements in the clean fuels sector has been limited, he has observed that fixed-price models are more commonly used.

"However, I anticipate that indexation-based contracts will become the dominant strategy in the future," he said. "This shift is likely once producers gain better visibility into production cost uncertainties and develop financial hedging strategies to manage scenarios where market prices fall below production costs."

In this area, like in others, there is currently a lot of uncertainty, but with more clarity expected in the coming months and years, both from regulators and from early movers among developers as their experiences show what may work well and what may not.

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HYDROGEN + AMMONIA ENGINEERING & CONSTRUCTION

This tracker covers hydrogen, ammonia, and methanol projects across the Gulf region, providing valuable insights into project status, timelines, and key players.

The content is made in conjunction with the Hydrogen, Ammonia & Methanol Engineering & Construction ConfEx taking place at the George R. Brown Center, in June 11-12.

Developers	Location	Production	Cost	Capacity	Technology	FID Expected / Development Stage	Offtake	Link	Expected Start up	Solution / Service Providers
Woodland Biofuels, Port of Louisianna	Globalplex multimodal facility at the Port of South Louisiana	Renewable Natural Gas and Green H2	$1.35 billion	Unknown	Waste Biomass	FEED to conclude in 2025	Unknown	Link	2028	Unknown
CF Industries	Donaldsonville Complex, Louisiana	Blue NH3	$200 million	1.7 Mmtpa	Addition of carbon dioxide dehydration and compression facility at the Donaldsonville Complex	Ongoing	Unknown	Link	2025	Storage - ExxonMobil Storage &, Transport - ExxonMobil in partnership with EnLink Midstream
Fairway Methanol LLC (Mitsui and Celanese Corp JV)	Clear Lake, Texas	Methanol	Unknown	1.63 million metric tons	Carbon Capture	Operational 2024	Unknown	Link		Unknown
CF Industries	Donaldsonville Complex, Louisiana	Green NH3	$100 million	20,000 tons green ammonia annually	20 MW alkaline water electrolyzer (TSK)	Underway	MOU signed with JERA for Supply of Clean Ammonia	Link	2023 - End	EPC - thyssenkrupp, Electrolyzer - thyssenkrupp
CF Industries, Mitsui & Co, LOTTE Chemical	Blue Point Complex, Louisiana	Blue NH3	$2 billion	1 - 1.4 Mmtpa blue ammonia	Steam methane reforming (SMR) & CCS	FID 2023	Lotte Chemical	Link	2027 - 28	Technology provider - thyssenkrupp
CF Industires, LOTTE Chemical	Blue Point Complex, Louisiana	Blue H2 & NH3	Unknown	Unknown	Unknown	MOU	Unknown		Unknown	Unknown
CF Industries, ExxonMobil, EnLink	Vermillion Parish, Louisiana	Blue H2 & NH3	Unknown	2 million tonnes carbon captured annually	ExxonMobil CO2 Storage	Project Underway	Unknown	Link	2025	CCS - ExxonMobil, CO2 Transport - EnLink Midstream
CF Industries, POSCO	Blue Point Complex, Louisiana	Blue H2 & NH3	$2 billion	Unknown	Autotermal reforming (ATR) & CCS	FEED to conclude H2 2024	Unknown	Link	2028 - 29	Unknown

SunGas Renewables, Beaver Lake renewable Energy	Central Louisianna	Green Methanol	$2 billion	400,000 mtpa	Biomass, carbon capture	Construction late 2024	Maersk	Link	2027	CCS - Denbury Carbon Solutions
CF Industries, NextEra, Part of the HALO Hydrogen Hub bid	Verdigris Complex, Oklahoma	Green H2 & NH3	Unknown	100,000 mtpa	100 MW electrolysis plant, Powered by deadicated 450-MW Renewable Energy Facility (NextEra)	MOU	CF Industries	Link	Unknown	Unknown
Air Products, AKA Clean Energy Complex, AKA Darrow Blue Energy	Ascension Parish, Louisiana	Blue H2 & NH3	$4.5 billion	7.5 MMtpa	Autotermal reforming (ATR) & CCS	Project Underway	Unknown	Link	2026	Topsoe - SynCOR Technology, EPC - Wood EPC, Air Compressor Trains - MAN Energy Solutions
Air Products, CF Industries, NextEra Energy, LSB Industries, Baker Hughes, Cherokee Nation, GE, Woodside	HALO Hydrogen Hub, Arkansas/ Louisiana/ Oklahoma	Green, Blue & Pink H2	Unknown	Green, Blue, Pink H2	Unknown	Failed to secure DoE funding	N/A	Link	Unknown	Unknown
Air Products, AES	Wilbarger County, Texas	Green H2	$4 billion	200 Mtpd Green H2	1.4 GW Wind & Solar	TBC	Air Products (under 30 year contract)	Link	2027	Unknown
Air Liquide, Chevron, LyondellBasell, Uniper	Houston, Texas (TBC)	Blue & Green H2	Unknown	TBC	Unknown	Awaiting results of Joint Study	N/A	Link	TBC	TBC
Air Liquide, INPEX, LSB Industries, Vopak MODA, Exolum	Houston Ship Channel	Blue NH3	Unknown	1.1 Mmtpa blue ammonia	Autotermal reforming (ATR) & CCS	pre-FEED	Unknown	Link	2027	CCS - Air Liquide, ATR - Air Liquide, Air Seperation Unit (ASU) - Air Liquide, EPC & Operations: LSB, Sotrage, handling, Very Large Gas Carriers (VLGC) - Vopak Moda and Exolum
Clean Hydrogen Works, Denbury, Hafnia, MOL Clean Energy, AKA Ascension Clean Energy (ACE)	RiverPlex, Megapark, South Louisiana,	Blue H2 & NH3	$7.5 billion	7.2 MMtpa		FID 2024	Unknown	Link	2027	CCS & Transport, via pipeline infrastructure - Denbury, Shipping globally - Hafnia, Shipping solutions - Mitsui O.S.K Lines (MOL), Low Carbon Technology Provider - Topsoe
GTI Energy, Chevron, AES, Air Liquide, Mitsubishi Power, ExxonMobil, Orsted, Sempra Infrastructure,,	HyVelocity Hub, Houston	Green & Blue H2	$1.25 billion private finance, Up to $1.25 billion public funding		Unknown	Selected for funding by the DoE	Unknown	Link	Unknown	Unknown

OCI, Linde	Beaumont, Texas	Blue H2 & NH3	$1.8 billion	1.1 MMtpa (scope to double to 2.2 MMtpa)	Autotermal reforming (ATR) & CCS	Project Underway	OCI	Link	early - 2025	Synthesis technology - KBR, CCS - ExxonMobil, EPC & Operation - Linde
ConocoPhillips, JERA Americas, Uniper	Gulf Coast TBC	Blue H2 & NH3	Unknown	2 MMtpa (potential to expand to 8 MMtpa)	Unknown	MoU and HoA	Uniper	Link	2030	CCS - ConocoPhilips,
Yara, Enbridge	Corpus Christi, Texas	Blue NH3	$2.6 - 2.9 billion	1.2 - 1.4 MMtpa	Autotermal reforming (ATR) & CCS	FEED underway	Unknown	Link	2027/8	Unknown
Yara, BASF	Gulf Coast TBC	Blue H2 & NH3	Unknown	1.2 - 1.4 MMtpa	Unknown	Feasability study end of 23	Unknown	Link	2028/9	Unknown
St Charles Clean Fuels, (Co-owned by Copenhagen Infrastructure Partners (CIP) &, Sustainable Fuels Group (SFG),	St Charles Parish, Louisiana	Blue H2 & NH3	$4.6 billion	3 Mmtpa	Unknown	FEED underway - FID end of 2024	Discussions ongoing wtih buyers in Europe and Asia, particularly South Korea.	Link	2027	Topsoe SynCOR Technology, Storage & Handling - International-Matex Tank Terminals (IMTT)
ExxonMobil, ADNOC	Baytown, Texas	Blue H2	Unknown	1 billion cubic feet per day	Autotermal reforming (ATR) & CCS	FEED underway	Unknown	Link	2027/8	FEED - Technip Energies, CCUS Technology - Honeywell, Topsoe SynCOR Technology
Sempra Infrastructure, AVANGRID	Unknown	Green H2	Unknown	TBC	Unknown	Heads of agreement (HOA) framework	Unknown	Link	Unknown	Unknown
RWE, Lotte Chemical, Mitsubishi	Corpus Christi, Texas	Green & Blue H2 & NH3	Unknown	10 Mmtpa	Unknown	Joint Study Agreement (JSA)	Unknown	Link	2030	Unknown
G2 Net-Zero,	Southwest Louisiana	Blue H2 & NH3	$11 billion - for the full 'Energy Complex'	TBC	Unknown	Unknown	Unknown	Link	2027	FEED - McDermott, NET Power, Siemens
Green Hydrogen International (GHI), INPEX	Hydrogen City, South Texas	Green H2 & NH3	Unknown	280,000 tpa green H2 (phase 1) (producing 1Mmtpa green NH3)	3.75GW behind the meter renewable power, 2.2GW electrolyzer production plant (phase 1), Salt caven storage	Joint Study Agreement (JSA) - Construction penciled for 2026	Unknown	Link	2029	Unknown

Orsted,	Gulf Coast TBC		Unknown	300,000 tpa e-methanol for shipping (Maersk)	1.2GW new onshore wind & solar PV, 675MW Power-to-X facility	FID End of 2023	Support marine shipping fuel, or as an input in SAF or in chemical production.	Link	2025	Unknown
BP, Linde	Linde facilities Houston & GC	Blue H2	Unknown	CCS Storage to allow production of Blue Hydrogen from Linde's exisiting Hydrogren facilities - quantity unknown	Unknown	Unknown	Unknown	Link	2026	C02 capture & compress - Linde,
Monarch Energy	Louisiana, Ascension Parish	Green H2	$500 million	120,000 kgpd	300MW Electrolyzer plant	FID 2025	Not agreed	Link	2027	Renewable power & transmission infrastructure - Entergy
ACME Greentech Ventures,	Port of Victoria, Texas	Green H2 & NH3	Unknown	1.2 Mmtpa	Unknown	Unknown	Not agreed	Link	Unknown	Unknown
First Ammonia,	Port of Victoria, Texas	Green H2 & NH3	$250 million (potential $1 billion build out)	Green Ammonia	Solid oxide electrolyzer cells (SOEC)	FID 2023	Unknown	Link	2026	Offtaker - Uniper, Electrolyzers - Topsoe solid-oxide electrolyzers
IGP Methanol	Plaquemines Parish, New Orleans	Blue CH30H	$3 billion	3.6 Mmtpa	Unknown	Unknown	Unknown	Link	2026	Haldor Topsoe Blue Methanol Technology, Linde, Veolia, Entergy
Lake Charles Methanol (Morgan Stanley)	Port of Lake Charles, Louisiana	Blue CH30H	$4 billion	3.6 Mmtpa	Autotermal reforming (ATR) & CCS	Construction expected Q2 2024		Link	2027	CCS Services - Denbury, Topsoe SynCOR technology
Proman, Mitsubishi Corporation, Idemitsu	Lake Charles, Louisiana	Blue NH3	Unknown	1.2 Mmtpa	Unknown	Currently going through FEED	Aim to supply off-takers in Japan	Link	Unknown	Topsoe SynCOR technology, Advanced KM CDR Process developed by MHI in collaboration with Kansai Electric Power
Energy Allied International -, Sandpiper Chemicals	Bay Street (Land leased from Eastman Chemical)	Blue CH30H	Unknown	3,000 mtpd	Unknown	Construction expected 2025		Link	2027	Unknown

Sempra Infrastructure, Tokyo Gas Company, Mitsubishi	Gulf Coast (TBC)	Green CH4	Unknown	130,000 tpa	Unknown	Unknown	Tokyo Gas Company, Osaka Gas Company, Toho Gas Company., and Mitsubishi Corporation	Link	Unknown	Unknown
TES (Tree Energy Solutions), TotalEnergies	Unknown	e-NG	Unknown	100,000 - 200,000 tpa	1 GW electrolyzer, Biogenic CO2	FID 2024	Not agreed	Link	Unknown	Unknown
New Fortress Energy, Plug Power, Aka: ZeroParks	Beaumont, Texas	Green H2	Unknown	50 tpd	100MW electrolyzer	Unknown	Not agreed, targetting industrial companies naeerby	Link	2025	Electrolyzers - Electric Hydrogen
HIF Global	Matagorda County, Texas	e-Gasoline	Unknown	200 mgpa	Silyzer 300 electrolyzers	FEED Underway - Construction Q1 2024		Link	2027	FEED - Bechtel Energy, Siemens Energy, Topsoe, Electrolyzers - Siemens
8 Rivers, SK Materials, Aka: Cormorant Clean Energy	Port Arthur, Texas	Blue Ammonia	$1.2 Billion	880k tonnes of Ammonia	8 Rivers' proprietary 8RH2 technology	Q1 2025	Produce will be sold for power generation in South Korea	Link	2027	8 Rivers - 8RH2 technology
Woodside Energy, Aka H20k Project	Ardmore, Oaklahoma		Unknown	Green Hydrogen - 60 tonnes a day (200MW renewable power required from the grid)		FEED complete - FID expected 2023	Not agreed	Link		KBR providing all engineering services, Nel Hydrogen electrolysis equipment, Air Liquide Liquefaction units

Soon-to-close Houston refinery is part of DOE's $1.2B hydrogen hub plan in Houston (msn.com)
Apex, partners plan GW-scale green hydrogen hub in Texas (renewablesnow.com)
Mystery developer announces plan to spend over $3bn on blue-hydrogen-to-methanol plant | Hydrogen news and intelligence (hydrogeninsight.com)
Nueces Green Ammonia | Green Ammonia for Export – Avina Clean Hydrogen Inc. (avinah2.com)
Gulf Coast | E-Methanol – Avina Clean Hydrogen Inc. (avinah2.com)