

North American LNG Construction Whitepaper:

Navigating Additional Uncertainty

Plus

Comprehensive LNG Export Project Tracker

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Introduction

The North American LNG industry continues its expansion, which remains concentrated on the US Gulf Coast, with progress also taking place in Canada and Mexico. In the US, some of the challenges for planned and under-construction projects are not new, but major obstacles have also emerged over the past year – on the regulatory side in particular. This has created additional uncertainty, especially for projects that have yet to reach the final investment decision (FID) stage.

Nonetheless, LNG developers continue to push ahead with plans, navigating their way around delays and cost overruns. In a September update, the US Energy Information Administration (EIA) estimated that North America's LNG export capacity was on course to more than double between 2024 and 2028, from 11.4 billion cubic feet per day in 2023 to 24.4 bcf per day in 2028, if projects currently under construction start on schedule. Over this period, the agency estimates that LNG export capacity will grow by 9.7 bcf per day in the US, 2.5 bcf per day in Canada and 0.8 bcf per day in Mexico. This expansion in capacity is expected to come from a combined 10 new projects across the three countries, the EIA said.

Notable milestones achieved over the past year include the FID on Canada's 3.3mn tonne per annum (mtpa) Cedar LNG project. However, no FIDs were announced in the US so far this year – despite various developers previously targeting them for 2024. This comes amid a move by the administration of

US President Joe Biden to pause approvals of applications to export LNG to countries with which the US does not have a free-trade agreement (FTA) at the start of the year. The pause was put in place to allow the US Department of Energy (DoE) to update the underlying economic and environmental analyses for export authorizations. It was subsequently challenged in court, and in July, a federal judge blocked the pause. However, the block is not expected to have a short-term impact on pending non-FTA export applications, as the ruling does not require the DoE to issue any specific approvals or stop the process of updating its analyses. As a result, various projects are facing delays in reaching FID, including expansions at existing facilities that are still undergoing permitting.

This is one of the most significant changes for the US LNG industry over the past year. "I think the main new thing is how rapidly the regulatory environment is shifting in the United States," says Jason Feer, the global head of business intelligence at Poten & Partners. "The pause on DoE export authorizations announced in January was a major shock as it appears likely it will affect nearly all US projects under development."

Other changes have been playing out over the longer term, such as cost escalation and a worsening shortage of manpower as the labor force on the Gulf Coast is stretched increasingly thin by a growing number of projects under construction. Mike Britton, an LNG consultant, points to a 40% increase

in costs between 2017 and 2022, with continued escalation from there. Meanwhile, according to Don Hill, the principal and owner of DKH LNG Consultants, one of the most significant trends is the recognition that direct labor costs are high and productivity is low, resulting in both schedule and budget overruns – though this is not specific to the past year alone.

These trends mean that risks are significantly higher for engineering, procurement and construction (EPC) contractors, illustrated most recently by Zachry Holdings filing for Chapter 11 bankruptcy protection while in the process of building QatarEnergy and ExxonMobil's Golden Pass LNG export terminal. Zachry claimed that by mid-2022, over \$2.4bn in additional funding was needed to complete the project on the schedule the Golden Pass partners wanted. In July 2024, a bankruptcy court approved a settlement that will allow Zachry to exit the project, while Chiyoda International and CB&I – the other two partners in the EPC joint venture building Golden Pass – complete construction. With EPC contractors more cautious about which new projects to take on in the face of increased risk, this is expected to lead to a wider variety of different contract terms being agreed to and a shift away from the lump sum turnkey (LSTK) model. With a reduced number of contractors available generally, and with their resources stretched by existing construction commitments, competition to secure contractors for new projects will be intense.

Decarbonization has also been a challenge for some time, and now looks more important than ever given closer regulatory scrutiny and ongoing efforts by environmental groups to block LNG projects via litigation. A notable recent setback for the LNG industry in this area has been NextDecade withdrawing the regulatory application to build a carbon capture and storage (CCS) facility to address future emissions from its under-construction Rio Grande LNG project. This move comes against the backdrop of a larger regulatory challenge for NextDecade, which saw its Federal Energy Regulatory Commission (FERC) authorization to build Rio Grande overturned by a court in August.

Other projects are prioritizing electrification as a means of minimizing emissions, but these efforts have also run into certain challenges, including backlogs of major equipment. Britton notes that most major electrical equipment – such as motors and transformers – is now considered to be long lead items that drive the execution timeline for a construction project and that require early definition and commitment. This is despite the fact that the long-term performance and benefits of electric drive (e-drive) motors are still largely unproven, he added.

Given the various and mounting challenges, some of the projects under construction are now expected to enter service later than originally expected. However, others have reached completion in recent months.

These include New Fortress Energy's Altamira Fast LNG project in Mexico, which shipped its first cargo in August 2024. Meanwhile, Venture Global LNG has been taking steps in preparation for the start-up of its Plaquemines export facility in Louisiana later this year. And Cheniere Energy expects to achieve first LNG from the Stage 3 expansion of its Corpus Christi terminal by the end of 2024, though construction of this expansion stage was only around 62.4% complete as of August.

Further new capacity is expected to come online in 2025, including Golden Pass LNG and more midscale trains at Corpus Christi Stage 3. LNG Canada on the British Columbia coast and Energia Costa Azul LNG in Mexico are also expected to enter production in 2025. More capacity still is scheduled to follow in the subsequent years.

Given the amount of capacity that is either planned or already under construction, a slowdown in some of the proposed projects would not be unusual, according to Hill. He

notes that the LNG industry has historically grown without experiencing some of the extreme swings from overcapacity to years of underinvestment as seen in other industries such as petrochemicals. However, if the record number of LNG project awards concentrated in short periods during the past decade becomes the trend, Hill cautions that the magnitude of swings between over- and under-supply could increase, which could deter investors.

Some of the most prominent challenges for the LNG industry – including cost inflation, EPC contracting, decarbonization and permitting and regulations – will be examined in more detail below. It is also worth bearing in mind that individual circumstances also play into how a specific developer can tackle the main obstacles for a particular project. What works for one may not work for another under different circumstances, but some of the more innovative approaches currently emerging can help prove the viability of certain paths forward and potentially offer a roadmap to others.



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"The pause on DoE export authorizations announced in January was a major shock as it appears likely it will affect nearly all US projects under development."

Cost inflation, delays and project design

The impact of cost inflation, coupled with schedule delays, on LNG construction is considerable and wide-ranging.

"In the last 4-5 years, LNG costs have increased from \$550/tonne to well over \$800-1,000/tonne, execution timelines have increased by 12-18 months due to extended equipment deliveries and labor availability, whilst at the same time buyers have been unwilling to increase LNG prices on a comparable basis," says Britton.

Developers and contractors alike have been looking at various options to address this, both in terms of the contracts they attempt to negotiate and in terms of project design. It is also the reason a number of developers are looking at debottlenecking their existing facilities.

Generally, debottlenecking can be achieved at around 25% of the cost of building new capacity, making it an attractive option. However, its impact is limited, with the process typically thought to have the potential to increase capacity by 7-15%. Relying on debottlenecking alone is therefore not enough to meet expected future increases in demand, so those developers pursuing it are still planning to build new capacity as well.

Modularization has been prominent as one of the approaches some developers have been taking to trying to minimize costs and schedules, while also reducing workforce requirements on the Gulf Coast, where labor

availability is stretched thin. Indeed, Hill sees the shift to modular designs as one of the main ways in which the LNG industry is trying to address workforce shortages. With a modular strategy, a large percentage of the workforce is provided in fabrication facilities with dedicated – and in most cases lower-cost – labor, according to Hill. He adds that this has also led to smaller capacity train sizes where the logistics are easier to manage.

Whether or not modularization succeeds in achieving these cost, schedule and workforce goals has been subject to debate. However, Feer believes that Venture Global's experience as it prepares to bring a second modularized facility into production has served to boost confidence in this approach, at least in terms of its impact on schedule.

"I think Venture Global has proven the modular approach to construction," says Feer.

"They've had some cost overruns on Calcasieu Pass, but they were able to recover that money by selling their own commissioning cargoes." Venture Global began exporting LNG from Calcasieu Pass ahead of schedule – going from FID to LNG production in 29 months – whereas it typically takes around four years to build an LNG plant according to Feer.

"I think the modular approach seems to have some promise, if not to cut the cost – although I assume over time, people will get better at it, and you won't have the same

kind of cost overruns – but to at least get you up and running faster, and that means you're generating revenue faster," he says.

Venture Global's approach has run into controversy, however, as despite achieving LNG production in record time, Calcasieu Pass went on to have the longest commissioning period for an LNG project, which is still ongoing. The time spent in commissioning has now exceeded 29 months – the same amount of time it took to bring Calcasieu Pass to production and exports in the first place.

During this time, cargoes from Calcasieu Pass have been sold on the spot market. This has led to disputes with some of the facility's long-term customers, who have accused Venture Global of holding back on servicing their contracts in order to sell cargoes on the spot market at higher prices. Long-term customers including Shell are now in arbitration against Venture Global, which has pushed back against their claims, arguing that it is not breaking any contractual obligations.

This dispute notwithstanding, Venture Global's record could help encourage others as they also increasingly opt for modularization. Feer cautions, however, that for companies with permits for stick-built projects already in hand, it would likely be easier to stick with existing plans given the time and money required to re-permit proposed facilities with a new design. Whether developers are opting for the stick-

built or the modular approach, they are all looking for ways to keep a lid on rising costs. However, with some of the costs involved, that may not be possible in the near term. For example, Feer points to wages in the US, which are rising faster than inflation.

"Given a shortage of skilled laborers, it's hard to see how you can keep your labor costs down," he says. "The cost of good-quality labor is rising and there just doesn't seem to be a whole lot you can do about that."

What developers and EPC contractors can do under these circumstances is aim for maximum efficiency with their workforce, according to Feer. He points to the example of Cheniere, which aims to retain its workforce by keeping projects rolling, one after another, so that skilled craft workers can be immediately redeployed.

"I think there's a real effort to make sure that as one project is completed, another one comes in so that you keep your work crews intact," says Feer.

Looking ahead, though, workforce shortages are still looming. Britton points to the fact that the average age of the workforce continues to increase, which "suggests that the clock is ticking". And EPC contractors are also "having to work harder to accommodate the needs and wants of their workforce, not to mention their skills and experience level", adds Britton.

"Having said this, projects will get done, it just might take a bit longer and cost a bit more," he says.

EPCs and contracting

These challenges have translated into a significant rise in risk for EPC contractors, particularly under the traditional LSTK model. Hill notes that in the US, many projects are being led by project developers that are new companies with limited or no balance sheets. When such developers look for financing but banks are unwilling to take on greater risk, this forces the developers to insist on full lump-sum EPC contracts. This, in turn, creates a situation where contractors are in danger of taking on too much risk.

The pressures EPC contractors have found themselves facing have translated into a number of bankruptcies, with Zachry being the latest. Labor dynamics have exacerbated the situation. Under these circumstances, it increasingly looks like aside from Bechtel, contractors increasingly do not consider LSTK to be a viable model. This trend is not new, and a shift was

already underway, with contractors and operators exploring more balanced risk-sharing arrangements, including hybrid and reimbursable contracts, in an attempt to ensure a smoother path forward for LNG construction projects. There is no consensus as yet about what contracting will look like in the future, but some of the emerging options include forming strategic partnerships across the project value chain where risk is shared more equally, incentivizing contractors with a cut of the project returns and going lump sum for the engineering and procurement while using an alternative model for construction.

"I think the days of full-scope, lump-sum EPC contracts is gone," says Britton. "Owners are going to have to be willing to accept some limited commercial risks on both some procurement items and labor." Britton expects the lack of full-scope EPCs

to result either in slower development or in more first-time joint venture relationships amid a dwindling pool of contractors, which come with larger execution risks,.

"Currently, here in the US you only have Bechtel and maybe Kiewit that are full-scope contractors who will self-perform that job without major sub-contracting and JV partners," he says. "Neither Chiyoda or JGC will accept US labor risks, so they require a US-based construction contractor. JGC has partnered with Fluor in the past and more recently on LNG Canada, but they will be stretched with Phase 2. Technip will only do modular projects and primarily focus on E, P & F, so they need a US partner to do construction and will seek to limit their liability for US-based construction, which leaves their partner holding all of the construction-related risks."

Operator options

Faced with these market conditions, some developers have sought to bring in deep-pocketed equity partners to help shoulder the burden.

“Since most US LNG projects are being progressed by private individuals or venture capital companies (not major IOCs with large balance sheets), this has forced owners to either look for other equity partners with large wallets or wait for supplies of equipment to improve to where project costs come down, where the project is more

affordable and able to attract the required investment capital,” says Britton. “Owners don’t have many levers to pull, about all they can do is try to find equity partners that also want to be a major buyer of the LNG product as a means of balancing their future supply risks.”

Another option for buyers in some cases is attempting to renegotiate LNG prices under existing offtake agreements – especially if operators propose modest price increases that would still ultimately be cheaper than

what a buyer would likely be offered if entering into new discussions with different developers. This approach still runs the risk of driving customers away, however, if the increase proposed is seen as too high. With different companies having varying levels of pricing and profit margins, whether they should attempt a price renegotiation should be considered on a case-by-case basis.

Regulatory hurdles

The main area of uncertainty for the US LNG industry, however, is the regulatory and policy sphere. This is especially the case for pre-FID projects, whose timelines to FID are based in part on receiving all necessary regulatory approvals on a predictable schedule.

With the DoE largely expected to keep holding off on non-FTA export authorizations until after the upcoming presidential election, expectations for Gulf Coast LNG volumes over the coming years are shifting somewhat. For those developers that are still seeking offtakers, this process could become more challenging, for example. “Without the permits, offtakers may be reluctant to commit to US projects and

lenders are unlikely to commit until volumes are sold,” says Feer. “For some offtakers, the current crop of issues is too much and we have heard that several that have sale and purchase agreements with US projects that have not gone to FID are looking at alternatives.”

On top of this, delays to project schedules make it difficult to accurately predict construction costs, given that quotes for major equipment and materials only have limited validity periods – often up to six months. This can result in repricing – further contributing to cost escalation – and schedule delays if equipment deliveries have to be pushed back at a time when demand for such equipment is rising.

Feer points to previous expectations that surpluses of LNG volumes would emerge in 2027-29 on the Gulf Coast if all the projects there targeting FID in 2023 and 2024 were built as planned and on schedule.

“But now, if you look at the potential for surpluses, given that you’re seeing delays throughout the pipeline, those possible surpluses look a lot less pronounced than they did,” he says.

The pause on issuing non-FTA export approvals is not the only cause for concern for LNG developers as far as policy goes. In late June 2024, the US Supreme Court overturned what is known as the Chevron doctrine, in place since 1984. The move

significantly curtails the authority of federal regulatory agencies. Under the Chevron doctrine, judges previously had to defer to agencies' interpretation of the law. Now, though, explicit congressional delegation of authority to agencies will be required. In cases where it is absent, delegation to agencies will not be inferred, and instead the power to interpret and apply regulations will be in the hands of federal judges.

This potentially paves the way to numerous new legal challenges and makes it significantly easier to block new regulations via a sympathetic court. Environmental regulations have been highlighted as one set of regulations that stands to be affected.

"That adds scope to the possibility of delays and court cases that people will have to work through," says Feer. He goes on to note that this comes at the same time that the environmental movement has grown increasingly hostile to LNG, having been willing to accept natural gas as a bridge fuel, but not as a long-term energy source. Feer adds that he believes the US is the only major gas-producing country where environmentalists can effectively challenge LNG project via litigation.

"I expect that's going to make environmentalists more aggressive about trying to go after LNG projects in the US," he says. "I think the whole regulatory environment has really shifted because of these various factors. It's going to have a tendency to push a lot of things back."

Against this backdrop, there have also been individual legal setbacks for specific projects. Both NextDecade and Texas LNG had their FERC authorizations revoked by the same court in early August 2024, with the court ruling that the agency had needed to issue supplemental environmental impact statements (EIS) when it had reapproved those projects in 2023.

In NextDecade's case, this was in large part linked to its inclusion of a CCS system in its regulatory application for Rio Grande LNG. The company has attempted to address this by withdrawing its FERC application for the CCS facility. However, it appears that Rio Grande will still require a supplemental EIS. In mid-September 2024, the FERC announced that it would carry out additional environmental reviews for both projects, preparing supplemental EIS statements for each by the end of July 2025 and then using those to decide whether to re-approve the

projects in line with the points raised in the court decisions.

While this looks like a step towards Rio Grande and Texas LNG getting back on track, the court cases nonetheless contribute to additional regulatory uncertainty, not just for those two projects, but for the broader industry.

"The 'pause' in DoE approvals earlier this year and more recent rescindment of FERC orders due to recent court decisions funded by NGOs is also undermining investor confidence and making it difficult for owners to progress their developments," says Britton.

The case of NextDecade having an approval overturned for an under-construction project is unusual and Britton expects it to be resolved. He notes that near-future expansion of LNG production in the US is underpinned by a number of projects that are either in construction or fully permitted.

And while the pause on non-FTA export licenses is contributing to additional uncertainty now, Industry expert Mehdy Touil is among those that are confident of its impact being relatively short-lived.



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"I think there's a real effort to make sure that as one project is completed, another one comes in so that you keep your work crews intact,"

"I don't see the politically driven regulatory obstacles being a challenge in the long run," says Touil. "The post-election phase will see a resurgence of applications for new projects."

Feer, for his part, points to the Democrats' track record in permitting most of the operational LNG projects to date.

"Democrats have actually been pretty good for LNG over the past couple of decades," he says. "But the question is, does that continue, especially with this concern about the impact of exports on domestic prices going forward?"

Feer also questions whether a win by Republican Donald Trump in the presidential election would automatically put an end to regulatory and policy uncertainty. He points to the fact that it was the Republican Supreme Court justices – including Trump appointees – that reversed the Chevron doctrine.

"They're the ones who are questioning the authority of regulatory agencies to do the

work that they've been doing for the past decade," he says.

In terms of the Biden administration's export license pause, meanwhile, the DoE has already made one exception, issuing a non-FTA export approval to New Fortress for its Altamira Fast LNG project in September 2024. In line with other Mexican projects, Altamira was designed to obtain its feed gas from the US, thus requiring it to also be permitted in the US.

The approval seems unrelated to the pause being blocked in court recently and appears to be more a case of exceptional circumstances. Britton points to the fact that the New Fortress LNG projects are located offshore on repurposed jack-up drilling rigs with a limited footprint and relatively low – "almost insignificant" – LNG volumes. On top of this, he adds, the project is already online, and located in Mexico.

Feer agrees that these circumstances worked in New Fortress' favor. "I think the grounds for not giving them a permit didn't

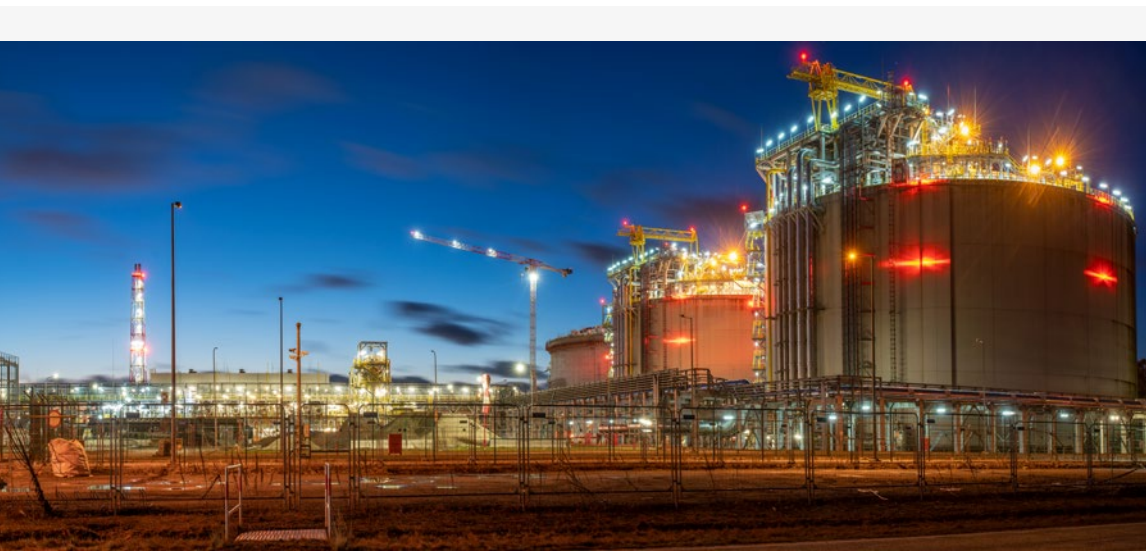
make sense because they were up and running," he says. "I think it's very much a one-off."

However, Feer goes on to highlight one aspect of the approval that could be significant – New Fortress had applied for a non-FTA export license until 2050 but was only awarded a five-year permit with the option to seek an extension after two years.

"The DoE said when they granted the five-year permit that they weren't confident in the forecasting that they had on how exports would affect domestic prices, and so they didn't feel that they could grant a 25-year license without greater certainty," says Feer. "It's a very small project, and so the notion that this small project is going to be the tipping point isn't really particularly credible."

Feer sees this as a warning sign that the DoE could go on to cite the uncertain impact on domestic prices as grounds for only granting five-year permits to other developers as well.

"That would be a huge problem for most of the US projects that are in the regulatory pipeline, because it's hard to imagine a situation where banks are willing to loan you when your repayment periods are 11-14 years for a project, but you only have five years [to export]," he says. "That would seem to be a risk that banks would be reluctant to take on, that the DoE decides prices are too high, so you can't have an extension to your five-year permit. Then you run the risk of having these stranded assets."



LNG Export North America Project Tracker

CANADA

LNG Canada

Location: Kitimat, British Columbia

Status: Under construction, with Fluor, one of the joint venture EPC partners, saying in July 2024 that it had completed the final weld on the first production train. As of September 2024, LNG Canada had begun receiving natural gas and had started flaring activities.

Capacity under construction: 14 million tonnes per annum (mtpa) from first two trains

Capacity proposed: a potential second phase, consisting of an additional 14 mtpa from two further trains

Partners: Shell (40%), Petronas (25%), PetroChina (15%), Mitsubishi Corp. (15%) and KOGAS (5%)

EPC contractor: JGC-Fluor

Targeted start-up date: 2025

Notes: LNG Canada represents the largest energy investment in Canadian history. The project is relying on a combination of energy-efficient gas turbines and renewable electricity to emit less than half the greenhouse gas emissions of the average LNG facility currently in operation. If the partners proceed with Phase 2, they would initially build it with gas-powered turbines, switching to electric motors as more power becomes available, based on comments made by executives in 2023 and 2024.

Woodfibre LNG

Location: Squamish, British Columbia

Status: Under construction, with concrete pouring for piperack foundations underway as of August 2024. Construction of the 18 modules for the facility began in the summer of 2023 and all modules are scheduled to be delivered by late 2025.

Capacity under construction: 2.1 mtpa from two trains

Capacity proposed: n/a

Partners: Pacific Energy (70%), Enbridge (30%)

EPFC contractor: McDermott International

Targeted start-up date: 2027

Notes: Woodfibre aims to be a net-zero emission LNG project during both construction and operation and will be powered using renewable hydroelectricity. All of Woodfibre's planned output was committed to BP following a third offtake agreement in September 2023.

LNG Export North America Project Tracker

CANADA

Ksi Lisims LNG

Location: Pearse Island, British Columbia

Status: Proposed, undergoing regulatory review

Capacity under construction: n/a

Capacity proposed: 12 mtpa

Partners: The Nisga'a Nation, Rockies LNG Partners and Western LNG

EPC contractor: Black & Veatch, in collaboration with Samsung Heavy Industries (SHI), was awarded a front-end engineering design (FEED) contract for the project's nearshore floating LNG (FLNG) production facility in July 2023. There have been no subsequent updates about contractors, but a separate project announcement in January 2024 mentioned that Ksi Lisims would use FLNG production units built by SHI and an all-electric process technology developed by Black & Veatch.

Targeted start-up date: The project website shows this as targeted for 2029 now, pushed back from 2028 previously.

Targeted FID date: The project website shows this as targeted for 2025 now, pushed back from 2024 previously.

Notes: Ksi Lisims LNG is expected to be one of the most significant Indigenous-led infrastructure projects in Canadian history. The partners are also targeting net zero emissions from the project by 2030. The project's first offtake agreement, with Shell for 2 mtpa, was signed in January 2024. In June 2024, a joint venture between the Nisga'a Nation and Western LNG acquired the shovel-ready Prince Rupert Gas Transmission pipeline project, with the intention of connecting it to the LNG facility. Construction on the pipeline began in August 2024. No further announcements relating to progress on the LNG facility had been made as of September 2024.

Cedar LNG:

Location: Kitimat, British Columbia

Status: Under construction as of June 2024, when an FID was announced.

Capacity under construction: 3.3 mtpa

Capacity proposed: n/a

Partners: The Haisla Nation (50%) and Pembina Pipeline (50%)

EPC contractor: SHI and Black & Veatch selected for the design, fabrication and delivery of the project's FLNG production unit

Targeted start-up date: 2028

Notes: Cedar LNG is aiming to become the first Indigenous-majority-owned LNG export facility in Canada, the world's first electric-driven FLNG project powered by renewable energy, the first air-cooled FLNG facility and Canada's first FLNG export facility. The project will be powered by renewable electricity, which the partners say will make it one of the lowest carbon intensity LNG facilities in the world. Feed gas will be supplied from the recently completed Coastal GasLink pipeline, which will also supply the nearby LNG Canada project.

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MEXICO



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Energia Costa Azul LNG

Location: Baja California

Status: Under construction, with a further expansion stage proposed, and 85% complete as of August 2024.

Capacity under construction: 3.25 mtpa from one train under construction since late 2020

Capacity proposed: A potential second phase, consisting of an additional 12 mtpa from two further trains

Partners: Sempra LNG (41.7%), IEnova – Sempra's subsidiary in Mexico – (41.7%) and TotalEnergies (16.6%).

EPC contractor: TechnipFMC

Targeted start-up date: Pushed back slightly to 2025 for mechanical completion and first LNG, followed by commercial operations in the spring of 2026.

Notes: Phase 1 of ECA LNG is a brownfield project involving conversion of an existing regasification terminal to exports. Feed gas for the project would be shipped in from the US and re-exported from Mexico. Sempra said in August 2024 that it had been experiencing labor and productivity challenges at the ECA site in prior months.

Vista Pacifico LNG

Location: Topolobampo, Sinaloa

Status: Proposed, with authorization received in 2022 from the US Department of Energy (DoE) to re-export US-sourced gas to countries with which the US does not have a free-trade agreement (FTA).

Capacity under construction: n/a

Capacity proposed: 2-3 mtpa according to Sempra's second-quarter earnings presentation for 2024

Partners: Sempra Infrastructure, IEnova, Mexico's Federal Electricity Commission (CFE) and TotalEnergies, though as of August 2024, plans and partnerships for the project remained preliminary and non-binding, as noted in Sempra's second-quarter earnings presentation

EPC contractor: None yet selected

Targeted start-up date: Unclear, but DoE export authorizations have seven-year deadlines, meaning exports would have to start by 2029 at the latest.

Targeted FID date: Unclear

Notes: Little mention has been made of Vista Pacifico LNG since Sempra announced in December 2022 that it had obtained export authorization from the DoE. The project continues to be listed as being under development on a non-binding, preliminary basis in Sempra's quarterly earnings presentations, and comments made by executives in 2023 suggest the company is prioritizing projects that are already under construction. However, a media outlet reported in July 2024 that Sempra was seeking initial offers from shipbuilders to build an FLNG unit for the project. Feed gas for Vista Pacifico would be shipped in from the US and re-exported from Mexico.

LNG Export North America Project Tracker

MEXICO

Saguaro Energia LNG

Location: Puerto Libertad, Sonora

Status: Proposed, with a collaboration agreement signed with the state government of Sonora in July 2023, enough sales volumes to proceed to FIDs on the trains comprising the first phase of the project, according to a January 2024 announcement.

Capacity under construction: n/a

Capacity proposed: 15 mtpa from three trains, potentially expandable by an additional three trains and a further 15 mtpa in a future second phase.

Partners: Mexico Pacific

EPC contractor: Mexico Pacific's website lists Bechtel as a partner in the project and touts a fully wrapped lump-sum turnkey (LSTK) EPC contract as part of the company's construction approach, though no announcement on the award of an EPC contract has been made public.

Targeted start-up date: 2027

Targeted FID date: In January 2024, Mexico Pacific was targeting two separate FIDs – first on Trains 1 and 2 and then separately on Train 3 – for later in 2024. As of mid-September 2024, no FID announcement had yet been made.

Notes: Like other Mexican projects, Saguaro Energia would source its feed gas from the US. Mexico Pacific lists Bechtel, Techint, ConocoPhillips and Baker Hughes as strategic partners in the Saguaro project. In November 2023, Mexico Pacific awarded an EPC contract for the construction of the Sierra Madre pipeline, which will supply Saguaro Energia.

Altamira Fast LNG

Location: Altamira, Tamaulipas

Status: The first of three planned 1.4 mtpa FLNG units is in operation and shipped its first cargo in August 2024. The second of three units is now under construction.

Capacity under construction: 1.4 mtpa at the second FLNG unit

Capacity proposed: A third 1.4-mtpa FLNG unit is also planned.

Partners: New Fortress Energy

Contractor: Fluor has been awarded the engineering, procurement and fabrication management contract for the first two units. No announcement has yet been made on the third unit.

Start-up date: The first FLNG unit started up in July 2024 after some delays including a three-month delay caused by a pipe event in April 2024. According to the latest information on New Fortress' website, the second FLNG unit is now targeted to enter service in the fourth quarter of 2026, with the third unit to follow thereafter.

Targeted FID date: n/a

Notes: New Fortress is deploying its floating, modular Fast LNG technology at Altamira, and the second FLNG unit will also entail conversion of the existing onshore LNG import terminal at the site. In September 2024, the company received non-FTA export authorization from the US DoE, despite the Biden administration's pause on issuing new export licenses. This was required because, like other Mexican LNG projects, Altamira sources its feed gas from the US. New Fortress had also previously talked about deploying a Fast LNG unit at the Lakach deepwater gas field, but media reported in November 2023 that it had terminated its deal with state-owned Pemex for the Lakach project.

LNG Export North America Project Tracker

MEXICO

AMIGO LNG

Location: Guaymas, Sonora

Status: Proposed, with a DoE re-export authorization to non-FTA countries received in 2020

Capacity under construction: n/a

Capacity proposed: 7.8 mtpa across two trains. Phase 1 would comprise a 3.9 mtpa train and a potential Phase 2 would add another train with a capacity of 3.9 mtpa.

Partners: LNG Alliance and its subsidiary, Epsilon LNG

EPC contractor: Contractors had been shortlisted in Singapore and China for the LNG liquefaction modules and in the US for the marine facilities as of September 2022 but there had been no further announcements as of September 2024.

Targeted start-up date: Alliance LNG's website shows this as still targeted for 2026, but the project is behind schedule with construction not having yet started. In August 2024, LNG Alliance announced that it had entered into a long-term LNG supply agreement with Malaysia's E&H Energy, for 3.6 mtpa starting in the third quarter of 2027, so this may be the new target start date. The company's FTA and non-FTA authorizations require start-up by December 2027.

Targeted FID date: The previously announced target date of 2023 passed with no updates.

Notes: Amigo LNG would use feed gas from the Permian Basin in the US, like other planned Mexican export terminals. As of 2022, feed gas availability for the second phase was unconfirmed. A week after announcing its deal with E&H Energy, Amigo LNG also entered into a heads of agreement (HoA) to supply LNG to Oman's OQ Trading.



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Sabine Pass LNG

Location: Cameron Parish, Louisiana

Status: In commercial operation, with 30 mtpa online across six trains of around 5 mtpa each and a further phase of expansion proposed.

Capacity under construction: n/a

Capacity proposed: Under the Sabine Pass Stage 5 Expansion Project, a further 20 mtpa of capacity, inclusive of debottlenecking opportunities, would be added at Sabine Pass. According to the latest information on Cheniere's website, this will consist of two large-scale trains of up to 8.43 mtpa each and a boil-off gas (BOG) re-liquefaction unit with a maximum production capacity of roughly 0.9 mtpa. This represents a scaling back of plans for the expansion from three trains to two, which the company attributed to cost optimization.

Partners: Cheniere Energy

EPC contractor: Bechtel, which built the first six trains at Sabine Pass and has been engaged to complete a FEED study for the proposed expansion project.

Start-up date: 2016

Targeted FID date for next stage: FID on the Stage 5 expansion is targeted for 2026, pending the receipt of regulatory approvals.

Notes: Sabine Pass is the first LNG export terminal in the Lower 48 US states and also the country's largest. Its construction the addition of liquefaction capacity to an existing regasification facility. In September 2022, it also became the first terminal in the world able to accommodate three LNG tankers simultaneously. Since November 2023, Cheniere has been signing offtake agreements for the second train of the Stage 5 Expansion Project.

Corpus Christi LNG

Location: Corpus Christi, Texas

Status: In commercial operation, with 15 mtpa online across three trains of around 5 mtpa each and a further stage of expansion under construction.

Capacity under construction: More than 10 mtpa from seven midscale trains of around 1.49 mtpa each under the Stage 3 expansion project. As of August 2024, construction on the expansion was around 62.4% complete.

Capacity proposed: Two further midscale trains, 8 and 9, have been proposed and are undergoing regulatory review.

Partners: Cheniere Energy

EPC contractor: Bechtel, which built the first three trains and is currently constructing the Stage 3 expansion.

Start-up date: 2019

Targeted start-up date for next stage: 2025, but as of August 2024, construction remained ahead of its original schedule and Cheniere was expecting first LNG production from the expansion by the end of 2024.

Targeted FID date for Midscale Trains 8 and 9: 2025, pending the receipt of all regulatory approvals. A positive environmental assessment was issued by the US Federal Energy Regulatory Commission (FERC) in June but the agency still needs to issue a full authorization. Cheniere says it already has the commercial support required to build these additional trains.

Notes: Corpus Christi LNG was the first greenfield export terminal to be built in the Lower 48 US states.

LNG Export North America Project Tracker

USA

Elba Island LNG

Location: Chatham County, Georgia

Status: In commercial operation, with 2.5 mtpa online across 10 modular trains of 0.25 mtpa each

Capacity under construction: n/a

Capacity proposed: No new capacity is planned, but an application was filed in 2023 to optimize the project, which would involve new installations and modifications to existing liquefaction facilities and would increase the terminal's capacity to around 2.9 mtpa.

Partners: Elba Liquefaction Co., which is a joint venture between Kinder Morgan (25.5%), Blackstone Credit (49%) and an unnamed partner that bought a 25.5% interest from Kinder Morgan in 2022. Kinder Morgan also operates the LNG terminal via its 100% ownership in Southern LNG, which also provides LNG storage, vaporization and ship-loading services.

EPC contractor: IHI E&C

Start-up date: 2019

Targeted FID date: n/a, with regulatory decisions on the optimization project previously expected in 2024 but still pending as of September, with the Biden administration's pause on new export approvals creating further uncertainty. The FERC has issued a positive environmental assessment for the optimization project but still needs to issue a full authorization.

Notes: The small-scale Elba Island project involved conversion of an existing regasification terminal to liquefaction. The liquefaction facility was built using Movable Modular Liquefaction technology.



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Cameron LNG

Location: Hackberry, Cameron Parish, Louisiana

Status: In commercial operation, with 13.5 mtpa online across three trains of around 4.5 mtpa each and a further stage of expansion proposed

Capacity under construction: n/a

Capacity proposed: Cameron LNG Phase 2 would consist of a single train, Train 4, with a capacity of up to 6.75 mtpa.

Partners: Sempra LNG (50.2%), Mitsui Group (16.6%), TotalEnergies (16.6%) and Japan LNG Investment (16.6%). Japan LNG Investment is a joint venture between Mitsubishi and Nippon Yusen Kabushiki Kaisha on a 70:30 basis.

EPC contractor: McDermott International and Chiyoda were the EPC contractors for Phase 1, comprising the first three trains. Sempra said on its fourth-quarter earnings call for 2023 that while it had been working with Bechtel on value engineering for Phase 2, it was still evaluating other EPC contractors at the same time. In May 2024, media also reported that Sempra was revisiting its selection because of rising construction costs.

Start-up date: 2019

Targeted start-up date for next stage: The current export authorization for Train 4 has a start-up deadline of May 2026. Sempra indicated in July 2023 that it could seek an

extension, though this process is now more challenging after the US DoE tightened up its policy on extensions.

Targeted FID date for next stage: In Sempra's fourth-quarter 2023 earnings call in February, executives said they were anticipating an FID on Train 4 in the first half of 2025, but cautioned that their efforts were focused on optimizing costs at the project first.

Notes: Phase 1 of the Cameron LNG export project entailed adding liquefaction capacity to an existing regasification terminal. In March 2023, the US FERC authorized Cameron LNG's amendment to its Phase 2 expansion plans. Under the amended plan, a single, larger train would now be built, instead of two trains previously. The amended expansion project also included plans to replace gas turbine drives with electric drive (e-drive) motors and tie-in facilities to enable the sequestration of carbon dioxide (CO₂). Efforts to expand production from the existing three trains by around 1 mtpa via debottlenecking are due to be completed in stages prior to Train 4. Sempra is also collaborating with a consortium of Japanese firms on assessing the feasibility of liquefying e-methane at Cameron LNG for export to Japan from 2030.

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Freeport LNG

Location: Freeport, Texas

Status: In commercial operation, with a nameplate capacity of 15 mtpa online across three trains of around 5 mtpa each and a further stage of expansion proposed. A debottlenecking project to increase capacity to 16.5 mtpa was completed in 2024 and Freeport was reported to have started operating above nameplate capacity at times by August.

Capacity under construction: n/a

Capacity proposed: Train 4, with a further 5 mtpa of capacity

Partners: Freeport LNG Development, which in turn is owned by Freeport LNG Investment (63.5%), JERA (21.9%), Osaka Gas (10.8%) and Japan Petroleum Exploration (JAPEX, 3.8%). Freeport LNG-GP is the sole general partner in the project. JAPEX bought into the project by acquiring a stake in JERA subsidiary Gulf Coast LNG Holdings in June 2024.

EPC contractor: Zachry Group and CB&I were awarded the EPC contract for Trains 1 and 2. For Train 3, the EPC contract went to an expanded venture comprising Zachry, CB&I and Chiyoda. Subsequently, CB&I was acquired by McDermott International in 2018, while construction of Freeport was underway.

Start-up date: 2019

Targeted start-up date for next stage: The current construction authorization for Train 4 has a start-up deadline of August 2028.

Targeted FID date for next stage: Unclear, as it was previously targeted for 2022 but was delayed amid a 10-month outage at the existing terminal following an accident in mid-2022. Freeport said it was continuing discussions with potential customers for Train 4 in March 2024, but no updates on progress have been issued since.

Notes: The first phase of the Freeport LNG export project involved the addition of liquefaction capacity to the existing regasification terminal. The liquefaction facility uses all-electric compression motor drive technology, and has been touted as the world's largest electric power-driven LNG facility of its kind. However, Freeport has struggled with ongoing operational issues, including the 10-month outage and several shorter outages that were exacerbated by extreme weather events. In April 2024, the company filed a lawsuit against Zachry, CB&I and Chiyoda, claiming that defects had been found in electric motors at the plant following an investigation in early 2024 and alleging that these were the cause of frequent outages at the facility.

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Calcasieu Pass LNG

Location: Cameron Parish, Louisiana

Status: Operating on a pre-commercial basis since March 2022. The project consists of 18 liquefaction trains, each with a capacity of 0.626 mtpa, configured in nine blocks for a total nameplate capacity of over 10 mtpa.

Capacity under construction: n/a

Capacity proposed: n/a

Partners: Venture Global LNG

EPC contractor: Kiewit

Start-up date: March 2022 on a pre-commercial basis, with Venture Global now seeking until February 2025 to launch commercial operations.

Notes: Venture Global used a midscale, modular approach and touts Calcasieu Pass as being the fastest large-scale greenfield LNG facility to ever be built, moving from FID to LNG production in just 29 months.

However, as of September 2024, the facility remained in what has become the longest-ever commissioning period for a US liquefaction project, which had also reached 29 months at this point. The company attributed this to extra time required to finish repairs. As a result, Venture Global has run into disputes with foundation customers, some of whom have started arbitration proceedings against it. Venture Global maintains that it has remained in full compliance with all obligations under its long-term contracts, including timing. In February 2024 the company applied to the FERC for a one-year extension to complete commissioning by February 2025. In June, the FERC ordered Venture Global to share documents relating to the start-up of Calcasieu Pass with its customers, as they dispute the request for an extension. The dispute remained ongoing as of late August. A request to increase the peak capacity of the facility from 12 mtpa to 12.4 mtpa through an uprate program was granted by the FERC in 2023.

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Plaquemines LNG

Location: Plaquemines Parish, Louisiana

Status: Phase 1 under construction since May 2022 and Phase 2 since March 2023, and nearing first LNG as of September 2024.

Capacity under construction: Nominally 20 mtpa in total, with a proposal to raise the peak capacity from 24 mtpa to 27.2 mtpa under an uprate program and Phase 1 accounting for 13.33 mtpa of this

Capacity proposed: n/a

Partners: Venture Global LNG

EPC contractor: KBR as lead contractor, with the KZJV joint venture comprising KBR and Zachry Group executing the development, engineering, procurement and construction under the EPC contract

Targeted start-up date: The facility was preparing to produce first LNG from Phase 1 in 2024, and was reported by media to have received its initial cool-down cargo – part of its commissioning process – in late August.

Notes: Venture Global is replicating the approach it used at Calcasieu Pass at Plaquemines. The Plaquemines facility will comprise up to 36 liquefaction trains, each with a nominal capacity of 0.626 mtpa configured in 18 blocks. A proposal to increase the peak capacity of the facility to 27.2 mtpa under an uprate program based on equipment efficiencies was approved by the US Pipeline and Hazardous Materials Safety Administration (PHMSA) in 2024 after receiving a FERC environmental assessment in 2023. In December 2023, Venture Global's CEO, Mike Sabel, told Reuters that Plaquemines would undergo a similar extended commissioning process to the one currently underway at the company's Calcasieu Pass terminal. Thus, if Plaquemines begins production in 2024, long-term customers may still not begin receiving contracted cargoes until around 2026 or 2027.

LNG Export North America Project Tracker

USA

CP2 LNG

Location: Cameron Parish, Louisiana

Status: Proposed, with the initial phase 9.25 mtpa of the terminal's 20 mtpa nameplate capacity sold as of mid-2024 and further marketing discussions ongoing

Capacity under construction: n/a

Capacity proposed: 20 mtpa nameplate capacity with a peak capacity of around 24 mtpa

Partners: Venture Global LNG

EPC contractor: Worley for Phase 1, with a reimbursable contract

Targeted start-up date: Media reports indicate that this has been pushed back from 2026 to 2028

Targeted FID date: The FERC approved CP2 LNG in June 2024, and the start of construction is targeted for later in the year, but a non-FTA export authorization from the DoE is still pending and the Biden administration's pause on issuing such authorization looks set to cause delays.

Notes: The design of CP2 would be similar, and equipment would be identical, to Venture Global's midscale, modular Calcasieu Pass LNG and Plaquemines LNG facilities. CP2 would consist of 18 liquefaction blocks, each with a nameplate capacity of around 1.1 mtpa of LNG. Nine blocks would be constructed per 10 mtpa phase. Given the replication of its previous designs, it seems likely that Venture Global can increase the peak capacity at CP2 through uprating.

Delta LNG

Location: Plaquemines Parish, Louisiana

Status: Proposed

Capacity under construction: n/a

Capacity proposed: 20 mtpa, consisting of 36 liquefaction trains, each with a capacity of 0.626 mtpa, configured in 18 blocks.

Partners: Venture Global LNG

EPC contractor: Not yet selected

Targeted start-up date: Unconfirmed

Targeted FID date: Unconfirmed

Notes: Little has been reported on Delta LNG as Venture Global focuses on building Plaquemines and reaching FID on CP2. However, the company would be expected to deploy the same midscale, modular approach at Delta, which it said may be built in two 10-mtpa phases. In pre-filing updates to the FERC, submitted in January and February 2024, Venture Global said it was updating its design for Delta to incorporate newly acquired acreage and to add carbon capture and storage (CCS) facilities to the project. The CCS component has not been mentioned since, with more recent updates only saying that Delta continues to update its design and plot plan.

LNG Export North America Project Tracker

USA

Golden Pass LNG

Location: Sabine Pass, Port Arthur, Texas

Status: Under construction since 2019

Capacity under construction: 18.1 mtpa across three trains, each with a capacity of 6 mtpa

Capacity proposed: n/a

Partners: QatarEnergy (70%) and ExxonMobil (30%)

EPC contractor: CCZJV, a joint venture comprising Chiyoda, McDermott International and Zachry Group, was originally selected, but Zachry filed for bankruptcy protection in May 2024, stalling construction. An interim settlement approved in court in July allows Zachry to exit Golden Pass while Chiyoda and McDermott complete construction on the project.

Targeted start-up date: Pushed back again to the end of 2025 following Zachry's bankruptcy. The Golden Pass partners have also asked the FERC for an extension of their deadline to bring the facility online, from 2026 currently until 2029.

Notes: The Golden Pass LNG export project entails adding liquefaction capacity to the existing regasification terminal, using the stick-built approach. The partners were initially authorized to build the plant with a capacity of 15.6 mtpa, but an increase to 18.1 mtpa was subsequently approved by regulators, driven by production efficiencies, rather than any changes to the plant's design.



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Port Arthur LNG

Location: Port Arthur, Texas

Status: Under construction since March 2023, with a further stage of expansion proposed and granted FERC approval in September 2023. In Phase 1, the developers will have to reapply to the Texas Commission on Environmental Quality (TCEQ) for an emissions permit that was revoked by a US Court of Appeals in November 2023. However, the court ruling has not stalled construction, which remained on budget and on schedule as of August 2024.

Capacity under construction: 13.5 mtpa across two liquefaction trains with a capacity of 6.75 mtpa each

Capacity proposed: Port Arthur LNG Phase 2 would add a further two trains, also with a combined capacity of 13.5 mtpa.

Partners: Sempra Infrastructure Partners, which is 70% owned by Sempra, 20% by KKR and 10% by Abu Dhabi Investment Authority (ADIA), owns and operates Port Arthur. Phase 1 is 28% owned by Sempra Infrastructure Partners, 30% by ConocoPhillips and 42% by KKR, after Sempra completed the sale of an indirect, non-controlling interest to KKR in September 2023.

EPC contractor: Bechtel is building Phase 1 and has also been awarded a fixed-price contract for Phase 2.

Targeted start-up date: 2027 for Train 1 and 2028 for Train 2 during Phase 1

Targeted FID date for next stage: Unclear. Phase 2 still needs non-FTA export approval and Sempra executives said in August 2024 that they do not expect the DoE pause on non-FTA approvals to affect their development timeline, implying that an FID will not come until at least 2025. Sempra has continued to pursue talks on offtake volumes and equity ownership at Port Arthur Phase 2. In June 2024, the company agreed a non-binding HoA with Aramco for 5 mtpa and a potential 25% equity stake in Phase 2 of Port Arthur.

Notes: Port Arthur LNG is a greenfield facility. Sempra is also planning to build CCS capacity to serve the Port Arthur terminal. The company acquired 38,000 acres of pore space in 2023 and filed a Class VI application for CO2 injection with the US Environmental Protection Agency (EPA) in February 2024.

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Rio Grande LNG

Location: Brownsville, Texas

Status: Under construction since July 2023 with a further stage of expansion proposed. As of June 2024, Phase 1 was on schedule with trains 1 and 2 around 24.1% complete and Train 3 around 7.8% complete. However, Rio Grande's FERC authorization was revoked by a court in August 2024. The FERC is now carrying out an additional review of the project in line with the court's requirements, with an authorization decision deadline of October 2025.

Capacity under construction: 17.6 mtpa across three liquefaction trains, each with a capacity of 5.9 mtpa

Capacity proposed: Two additional trains are proposed to bring Rio Grande LNG's total capacity to 27 mtpa. FIDs on trains 4 and 5 are expected to be made separately.

Partners: NextDecade owns and operates Rio Grande LNG. For Phase 1, the company retains a 20.8% equity interest, Global Infrastructure Partners (GIP) owns 46.1%, TotalEnergies holds 16.7%, GIC owns 9.9% and Mubadala Investment holds 6.5%. TotalEnergies has also acquired a 17.5% interest in NextDecade and Mubadala owns a 5.4% interest in the company. In May 2024, Abu Dhabi National Oil Co. (ADNOC) agreed to acquire an 11.7% interest in Phase 1 from GIP, which will become effective upon an FID being reached on Train 4.

EPC contractor: Bechtel is the EPC contractor for Phase 1 and was awarded an LSTK EPC contract for Train 4 in August 2024.

Targeted start-up date: 2027

Targeted FID date for next stage: An FID on Train 4 was being targeted for the second half of 2024 prior to the revocation of the FERC permit. NextDecade has said it is working to ensure Phase 1 is still delivered on time and on budget, and that FIDs on trains 4 and 5 are not "unduly delayed".

Notes: The original FEED for Rio Grande LNG was based on six trains, each with a capacity of 4.5 mtpa. NextDecade redesigned the project to produce 27 mtpa from five trains instead of six, unveiling the updated plans in 2020. The company had also planned to reduce CO2 emissions from the project by more than 90% using CCS. However, the revocation of Rio Grande's FERC authorization was linked in large part to the CCS project requiring additional review according to the court. Two weeks after the court ruling, NextDecade withdrew its FERC application to build the CCS project, saying it was not sufficiently developed to allow FERC review to continue at this time.

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Lake Charles LNG

Location: Lake Charles, Louisiana

Status: Proposed and fully permitted, with almost 8 mtpa of its capacity sold as of August 2022. However, an application was filed with the US DoE for a new non-FTA export authorization in August 2023 after a request for an extension of the project's existing authorization was rejected.

Capacity under construction: n/a

Capacity proposed: 16.45 mtpa across three liquefaction trains, each with a capacity of 5.5 mtpa

Partners: Energy Transfer, which said on its third-quarter earnings call for 2023 that it was in negotiations with potential equity partners and was aiming to retain around 20% equity ownership. In January 2024, Kyushu Electric Power said it was considering an equity investment into Lake Charles LNG, but media subsequently reported that it would wait until the Biden administration pause on export approvals is lifted before making any decision.

EPC contractor: KTJV, a joint venture between KBR and Technip Energies, was awarded the EPC in September 2024.

Targeted start-up date: 2028, though Energy Transfer is seeking an extension of its deadline for placing the terminal into service to 2031 via a new application

Targeted FID date: Energy Transfer has been urging the DoE to expedite a decision on Lake Charles LNG, citing the project's unique circumstances.. Prior to the Biden administration's pause on non-FTA approvals, Energy Transfer had said it was tough to provide an exact estimate given that FID depended on receiving a new DoE authorization. A Lake Charles executive said in September 2024 that an FID would also depend on securing sufficient offtake commitments and third-party equity.

Notes: The Lake Charles LNG export project entails adding liquefaction capacity to an existing regasification terminal. The company has said it cannot complete the project by the current deadline and needs more time. It has attributed this to unplanned delays, including those caused by the Covid-19 pandemic, and a decision to add a CCS component to the plant.

LNG Export North America Project Tracker

USA

Texas LNG

Location: Brownsville, Texas

Status: Proposed and fully permitted, but the project's FERC authorization was withdrawn by a court in August 2024, with the court requiring additional environmental review. The FERC is now carrying out an additional review of the project, with an authorization decision deadline of October 2025.

Capacity under construction: n/a

Capacity proposed: 4 mtpa across two liquefaction trains, each with a capacity of 2 mtpa

Partners: Glenfarne Group, with Samsung Engineering holding a minority interest

Lead contractor: Technip Energies USA and Samsung Engineering

Targeted start-up date: 2028, but Glenfarne has asked the FERC for an extension until 2029 to bring the project online

Targeted FID date: This was most recently being targeted for 2024, but it is unclear to what extent the revocation of the project's FERC permit could cause further delays.

Notes: Glenfarne expects that Texas LNG's liquefaction process will eliminate most CO2 emissions by using e-drive compression powered by renewable generation. The Texas LNG project will use Technip Energies' SnapLNG technology, which combines a compact modular design concept for mid-scale trains with standardized components and technology. As it works towards FID, Glenfarne has announced various deals related to Texas LNG, including separate equipment contracts with Baker Hughes and ABB and a series of preliminary HoAs plus one definitive agreement for offtake. Announcing the latest HoA in September 2024, Texas LNG said it had now secured enough offtake commitments to proceed to FID. This came after Texas LNG said in March that it had received sufficient expressions of interest from banks to move to the execution phase of project financing.

LNG Export North America Project Tracker

USA

Magnolia LNG

Location: Lake Charles, Louisiana

Status: Proposed and had been fully permitted, but its non-FTA export authorization had required Magnolia to begin commercial operations before December 2023 and has since expired. Operator Glenfarne requested a new authorization to export LNG to non-FTA countries in November 2023, which was still pending as of September 2024.

Capacity under construction: n/a

Capacity proposed: 8.8 mtpa across four liquefaction trains, each with a capacity of 2.2 mtpa

Partners: Glenfarne Group

EPC contractor: Originally, the EPC contract was awarded to KSJV, a joint venture between KBR and SK Engineering & Construction. In 2020 KBR announced it would exit most of its LNG construction projects, but subsequently entered into a joint venture for a separate LNG project – Lake Charles LNG – in September 2024, suggesting that it is not exiting the business after all. In its 2023 non-FTA export application to the DoE, Glenfarne said it had initiated a new EPC contractor selection process in 2022 because of KBR's expected exit from the LNG industry. As of November 2023, the selection process was down to two shortlisted contractor parties.

Targeted start-up date: Unclear, given that Glenfarne is awaiting a new non-FTA export authorization.

Targeted FID date: Unclear

Notes: Glenfarne intends to deploy its OSMR liquefaction technology at Magnolia, which it says will allow the facility to generate lower greenhouse gas (GHG) emissions than other conventional LNG processes. In its 2023 non-FTA application, the company also said it was exploring options for capturing Magnolia's emissions using CCS and potentially using them to produce clean fuels.

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Driftwood LNG

Location: Calcasieu Parish, Louisiana

Status: Proposed and fully permitted, with some pre-FID construction having taken place since March 2022, including the piling and compressor foundations for the first block of trains being completed by September 2023. An FID now looks more likely following Woodside's acquisition of Tellurian, including Driftwood.

Capacity under construction: n/a

Capacity proposed: 27.6 mtpa across 20 liquefaction trains, each with a capacity of 1.38 mtpa, with the trains configured in five blocks of four trains each. Phase 1 would comprise 11 mtpa of capacity and two blocks of trains.

Partners: Tellurian, which was in the process of being acquired by Woodside as of September 2024, with the deal due to close in the fourth quarter of the year.

EPC contractor: Bechtel, with an LSTK contract

Targeted start-up date: The facility's FERC authorization is valid until the second quarter of 2029 and Woodside believes it can bring Driftwood online prior to that if it takes FID in 2025.

Targeted FID date: Woodside is aiming to have Driftwood FID-ready in the first quarter of 2025.

Notes: Woodside's acquisition of Tellurian marks a reversal of fortunes for Driftwood. Tellurian had suffered a series of setbacks including the termination of its previous offtake agreements and had issued warnings over its ability to continue as a going concern in 2023-24. Woodside said in September 2024 that it does not intend to use project financing for Driftwood. The company is now seeking equity partners for the project, but has said it wants to retain at least a 50% interest.

Gulf LNG

Location: Jackson County, Mississippi

Status: Proposed and fully permitted, with an extension granted by the FERC in May 2024 to build the project, until July 2029

Capacity under construction: n/a

Capacity proposed: 10.85 mtpa

Partners: Kinder Morgan, which also has a 50% interest in the existing regasification facility, via its Southern Gulf LNG subsidiary, which in turn holds 50% in a subsidiary of Gulf LNG Holdings. The remaining 50% is held by investors including subsidiaries of the Blackstone Group, Warburg Pincus, Kelso and Co., and Chatham Asset Management.

EPC contractor: Not yet selected

Targeted start-up date: Unknown, but now needs to be by 2029 and the partners estimate that construction would be completed 52-56 months after reaching FID.

Targeted FID date: Unknown

Notes: The Gulf LNG export project would involve liquefaction capacity being added at the site of an existing regasification terminal. However, until the FERC filings in 2024, there had been no updates on the project since 2022, and prior comments by Kinder Morgan executives suggested that it was unlikely to be a priority. The FERC extension order said the partners had been actively developing the project, including by seeking long-term offtakers, but had run into delays because of the Covid-19 pandemic and litigation with Gulf Energy's existing import customers.

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Delfin LNG

Location: Port Delfin, Cameron Parish, Louisiana

Status: Proposed and had been fully permitted, including by the US Maritime Administration (MARAD) because of the offshore portion of the project. However, MARAD said in April 2024 that it no longer supported its approval of Delfin because of "widespread changes" to the project, and invited the company to submit an amended application. A request for an extension of the project's non-FTA export license was also pending with the DoE as of September 2024.

Capacity under construction: n/a

Capacity proposed: 13.3 mtpa across four FLNG vessels, each with a capacity of almost 3.5 mtpa

Partners: Delfin Midstream. In June 2023 it was announced that Mitsui OSK Lines (MOL) had agreed to make an investment into Delfin LNG, but the full extent of MOL's participation has not been disclosed to date. Enbridge also holds a 5% interest. According to MARAD, as of 2023, Delfin was proposing to have the FLNG vessels potentially owned, financed and operated by third parties.

EPC contractor: An LSTK EPC contract had been reported to be close to being finalized for some time with Samsung Heavy Industries and Black & Veatch, which completed the FEED for newbuild FLNG vessels for the project, for the first of the vessels. In August 2023,

Delfin also awarded a design and engineering contract to Wison Offshore & Marine for the development of further FLNG vessels for the project. Wison said at the time it was aiming to continue into a full FEED later in 2023 so it could begin FLNG vessel construction in 2024. No subsequent updates had been issued about Wison's participation as of September 2024.

Targeted start-up date: Delfin's FERC authorization for the construction of the onshore portion of the project has been extended until September 2027.

Targeted FID date: Delfin's latest goal, as of June 2024, was to have the project's first three FLNG vessels FID-ready by the end of 2024.

Notes: Delfin LNG is a brownfield deepwater project and requires minimum additional onshore infrastructure. The project will be served by the UTOS gas pipeline. On its website, Delfin notes that it also owns a second pipeline system, Grand Chenier, which may either be used to develop a second deepwater port known as Avocet LNG or to expand Delfin by a further two FLNG vessels with a combined capacity of 8 mtpa. Neither option had yet advanced to the regulatory review stage as of September 2024.

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Alaska LNG

Location: Nikiski, Alaska

Status: Proposed and fully permitted

Capacity under construction: n/a

Capacity proposed: 20 mtpa across three liquefaction trains, each with a capacity of 6.7 mtpa

Partners: Alaska Gasline Development Corp. (AGDC), which is owned by the State of Alaska and is seeking equity partners to take over a 75% interest in Alaska LNG

EPC contractor: Not yet selected

Targeted start-up date: 2029 for Phase 1 under AGDC's latest proposal

Targeted FID date: 2025 for Phase 1 under the latest proposal

Notes: Proposals for Alaska LNG has undergone various changes since the project was first conceived. Producers BP, ExxonMobil and ConocoPhillips pulled out as partners in the project in 2016 amid concerns over Alaska LNG's economics in a period of abundant gas supplies and low prices. AGDC lowered the cost of the project from \$45bn to \$38.7bn, including the costs of developing the feed gas pipeline from the North Slope, but the price tag continued to deter potential investors. In an effort to keep the project alive, AGDC updated the project plan again in 2024, proposing a phased approach, with Phase 1 involving construction of the pipeline to serve the Alaskan market and pave the way for future LNG exports. Phase 1 is estimated to cost \$10.7bn. AGDC said in April that if it fails to secure funding for Phase 1 by the end of 2024, it would shut down and sell or mothball the project assets. However, the plan received a boost in June 2024, when AGDC entered into a preliminary gas supply agreement with Pantheon Resources.

Commonwealth LNG

Location: Cameron Parish, Louisiana

Status: Proposed, with authorization to construct the terminal and to export LNG to FTA countries but still awaiting a non-FTA export permit from the US DoE. However, a court ruled in July 2024 that further FERC review was required, though it did not overturn the existing FERC authorization.

Capacity under construction: n/a

Capacity proposed: 9.3 mtpa across six liquefaction trains, each with a capacity of 1.4 mtpa

Partners: Kimmeridge, which increased its stake in Commonwealth LNG to over 90% in June 2024.

EPC contractor: Technip Energies

Targeted start-up date: Pushed back to the fourth quarter of 2028

Targeted FID date: Pushed back to the first half of 2025

Notes: Commonwealth is taking a modular approach to construction, with the aim of lowering costs and minimizing the time required to build its facility. As of September 2023, the company had signed deals supply deals totaling 6 mtpa, and in September 2024 it signed a heads of terms agreement with Glencore for 2 mtpa.. In November 2023, Commonwealth also entered into a preliminary agreement on the development of CO2 capture capacity near its LNG site.

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Gulfstream LNG

Location: Plaquemines Parish, Louisiana

Status: Proposed, with permitting in process, FERC pre-filing underway and an authorization to export to FTA countries received as of January 2024.

Capacity under construction: n/a

Capacity proposed: 4 mtpa across three liquefaction trains, each with a capacity of 1.4 mtpa

Partners: Gulfstream LNG

EPC contractor: None yet, but in October 2023, Gulfstream announced that it had selected Kiewit to provide support developing the appropriate EPC model for the project during the FEED process.

Targeted start-up date: Gulfstream said it anticipated initial production within six years .

Targeted FID date: Unclear

Notes: Gulfstream has taken steps forward since the proposal was first launched in 2023. In the first half of the year, the company also entered into a term sheet agreement with a gas transportation firm that operates an extensive pipeline network in the area surrounding the project. In October 2023, Gulfstream said it had selected Baker Hughes and Honeywell UOP to provide equipment to the project. The company said it was designed its facility based on the use of mid-scale, modular liquefaction trains like those being deployed by other projects in the region. It also intends to use e-drive technology to lower Gulfstream LNG's emissions and will evaluated the extraction of CO2 from its feed gas for storage and utilization by third parties. Gulfstream believes it has secured one of the last remaining permittable LNG export project sites on the US Gulf Coast.

Qilak LNG

Location: North Slope, Alaska

Status: Proposed, with a feasibility study underway as of March 2023 but not yet in the regulatory approval process

Capacity under construction: n/a

Capacity proposed: 4 mtpa

Partners: Lloyds Energy

EPC contractor: n/a

Targeted start-up date: Unclear

Targeted FID date: Qilak executives said in March 2023 that if the feasibility study was completed in 2023 and FEED in 2024, an FID could be possible in 2025 depending on a number of conditions. However, as of September 2024, there had been no updates.

Notes: Qilak LNG plans to use gravity-base structures set offshore of Alaska and to deliver 3-5 tankers per month to Asia. It will not require the addition of major pipeline infrastructure, given its proximity to Alaskan gas production.

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Argent LNG

Location: Port Fourchon, Louisiana

Status: Newly proposed as of 2024, not yet undergoing regulatory review

Capacity under construction: n/a

Capacity proposed: Up to 20 mtpa

Partners: Argent LNG

EPC contractor: Worley selected as the EPC contractor and Kiewit as a construction partner, though it is unclear whether the agreements are definitive. Worley said in June 2024 it would initially focus on identifying the preferred technology and layout for the site.

Targeted start-up date: 2029-30

Targeted FID date: Unclear

Notes: Argent LNG appears to have taken over a site vacated by the now-terminated Fourchon LNG. In September 2024, Argent signed a memorandum of understanding (MoU) with ABB to collaborate on automation and electrical infrastructure for the facility as it aims to develop a low-carbon project.



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