

# PROJECTS WITH PURPOSE

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**Bhupesh Thakkar, Bechtel, US**, outlines the importance of LNG terminals as more countries commit to ambitious energy transition initiatives.

**B**echtel and their partners are delivering on the world's energy transition commitments. As governments globally commit to decarbonisation goals to responsibly reduce carbon footprints, Bechtel's partners are focused on delivering reliable energy to communities around the world while reducing greenhouse gas (GHG) emissions.

As a longstanding EPC partner to both industry and government, Bechtel upholds its responsibility to engineer and execute transformative energy projects that create a

lasting positive legacy. For 124 years, Bechtel has played a vital role in evolving the energy infrastructure – from nuclear to petroleum and from natural gas to biofuel and renewables. Energy is constantly in motion, so Bechtel are executing today and evolving for tomorrow.

## **Powering the world with carbon-neutral energy**

LNG serves as a gateway to a stable energy platform and is a key cornerstone to the world's energy transition

**Figure 1.** Cheniere's Sabine Pass facility's modern infrastructure is surrounded by Louisiana wetlands, with a view of the Gulf of Mexico and the Texas border.



goals; with it, global communities can connect to the grid with carbon-neutral fuel. The demand for LNG is growing exponentially as countries commit to switching from coal to cleaner, more efficient energy sources. The need will only continue to grow from here as more customers take on mega-projects that will shape the energy landscape in the years to come.

To meet this demand, Bechtel is leveraging its integrated EPC self-perform model and strategic partnerships to deliver a total capacity of 75 million tpy across 17 large scale LNG trains since 2015. To date, the company has built more than 40 amine-based CO<sub>2</sub> and H<sub>2</sub>S removal systems for LNG plants, gas processing plants, and refineries.

During the planning, design, and construction phases, Bechtel implements a one team approach with its clients, because communication is essential to a project's success. The company's one team approach is based on six fundamental values, which Bechtel implements on all of their projects. They are safety, quality, integrity, respect, transparency, and diversity and inclusion.

Controlling the critical path, integrating teams, reducing interfaces, and managing project risks empowers EPC



**Figure 2.** Cheniere is helping meet the demand for reliable, carbon-neutral energy to power facilities around the world. Sabine Pass Liquefaction and Corpus Christi Liquefaction have reliably and safely produced more than 2100 cargoes over the last nine years.



**Figure 3.** 15 July 2022 marked another important step toward meeting the increased demand for natural gas. Together with CPC Corporation and MRY, Bechtel are delivering cleaner, greener, and safer energy to Taiwan, supporting both their energy growth and security.

contractors to strive for shorter delivery schedules while mitigating risks and increasing certainty of outcomes, thus producing increased value for the end user while delivering on the company's net zero commitments. Bechtel designs and manages projects to meet customers' needs and adapt to challenges that may arise, ensuring minimal disruption and a high level of customer satisfaction.

## Delivering certainty

In 2005, when Cheniere Energy planned its original regasification plant on the Gulf of Mexico, the US was one of the world's largest importers of natural gas. Booming gas output from the country's shale formations subsequently transformed and turned that market around.

Cheniere approached Bechtel to execute the full EPC of the Sabine Pass Liquefaction facility, which was built and expanded over the course of nine years. The facility has six fully operational liquefaction units – each capable of producing approximately 5 million tpy of LNG.

More than 4.7 billion ft<sup>3</sup>/d of natural gas passes through Sabine Pass Liquefaction's storage tanks, shipping berths, and pipelines, and is exported as LNG to provide reliable power to facilities and homes around the world.

The relationship between Bechtel and Cheniere is a culmination of 15 years of trust and innovation in the company's energy infrastructure. The combined components for the six trains equals 361 000 yd<sup>3</sup> of concrete, 89 000 t of structural steel, approximately 400 miles of pipe, and >3600 miles of electrical cable. That is enough cable to stretch from Houston all the way to Alaska, US.

There was a challenge to constantly enhance the company's execution, utilise the latest tools and design optimisations while expanding the facility, and compete with other projects vying to meet the world's increasing energy demands. This proved to be a pivotal undertaking in cementing the relationship with the company's client.

Bechtel also adopted a design-with-the-end-in-mind approach that enabled the company to utilise their innovation tools, and it assisted the project execution team in replicating a design while optimising it and incorporating lessons learned. By controlling the critical path, integrating teams, reducing unnecessary interfaces, and managing project risks, Bechtel is confident it can deliver what it promised to clients.

Whether navigating industry challenges, such as market turbulence from changing from a regasification to a liquefaction market, or challenges posed by nature, such as taking direct hits from six tropical storms or hurricanes, the one-team approach between Bechtel and Cheniere was instrumental in progressing the project and achieving completion earlier than the contractual schedule.

It has been the company's experience that the success of a project is primarily determined by the quality of its LNG team. Bechtel collaborated with Cheniere to overcome the weather challenges by implementing decisive actions that minimised damage to materials awaiting installation, keeping the project on track.

The resulting LNG success story for Cheniere yielded six trains on Sabine Pass and three trains on the Corpus Christi Liquefaction project across nine years for a total of approximately 45 million tpy and more than 2100 cargoes of LNG.

The collaboration between the companies continues with the construction of Corpus Christi Stage 3, which consists of seven mid scale (approximately 10 million tpy combined capacity) liquefaction trains, and associated facilities and utilities. When complete, this expansion will help meet the increasing global demand for LNG as a transitional energy source.

## Storing future fuels

Communities worldwide are struggling to maintain reliable energy solutions. While having a diverse energy portfolio – including renewables – is critical to ensure sustainable power, so is the ability to have immediate access to energy to meet demand when renewable options are offline. This makes LNG such a critical component to the world's strategy in transitioning to renewable energy.

Bechtel assists and enables its customers to deliver a range of storage solutions for LNG that creates essential access to on-demand energy. This allows energy providers to purchase and store gas when LNG prices are low, maintaining an affordable energy supply.

## Building more capacity

To meet the energy mix goals stipulated by the Taiwanese government to reduce reliance on coal and nuclear and increase power production using LNG, the state-owned CPC Corporation plans to build new regasification and storage facilities as well as expand existing terminals over the next five to 10 years. The phase three expansion of CPC's Taichung import terminal is integral to that plan and will add 360 000 m<sup>3</sup> of storage capacity and

associated regasification facilities on the west coast of Taiwan.

Bechtel is executing the EPC of two 180 000 m<sup>3</sup> full-containment LNG tanks. Together, CPC and Bechtel are helping Taiwan to meet the country's clean energy aspirations by rapidly expanding the country's LNG import terminals, supporting the move from coal to natural gas as their primary transitional source of energy.

## Progressing the energy transition

The access to reliable and efficient energy plays a key role in moving forward social and economic progress – and technological advancements have created new opportunities to improve how power is brought to communities worldwide. For more than 50 years, Bechtel has continued to partner with customers all over the world to execute large scale LNG projects, thus developing one-third of the world's total LNG capacity.

## Providing cleaner energy and building opportunities

As more countries around the world commit to ambitious energy transition initiatives, Bechtel is ready to assist them in meeting their emission reduction goals and building a greater energy economy for the global community.

Net zero is achievable with proper planning and actions, using innovative technologies, and implementing solutions. With each action, Bechtel has the power to transform the energy landscape and help governments achieve their net zero commitments. **LNG**