



Thinking Big on a Small Scale

LNG SOLUTIONS

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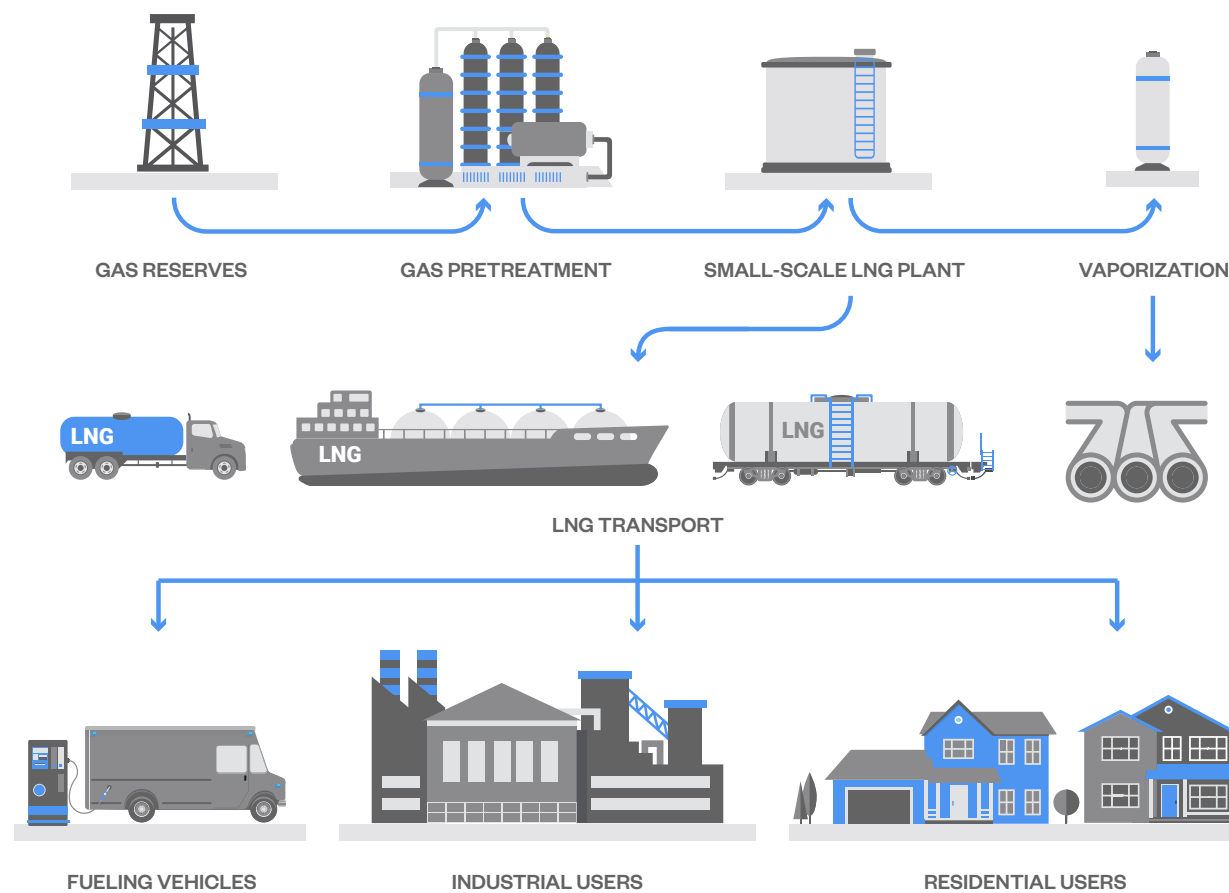
Growing Demand for Smaller LNG Plants

New markets and applications for liquefied natural gas (LNG) are driven by the environmental benefits of natural gas (lower carbon and particulate emissions), LNG's low cost compared with competing fuels and continuing advancements in transportation.

The market today is shaped by the following trends:

- Development of traditional peak shaving plants, used by utilities to meet demand surges.
- Stricter environmental standards, and the high cost of ultra-low sulfur fuels, are driving the use of LNG for bunkering fuel in the marine industry.

The Small Scale LNG Journey



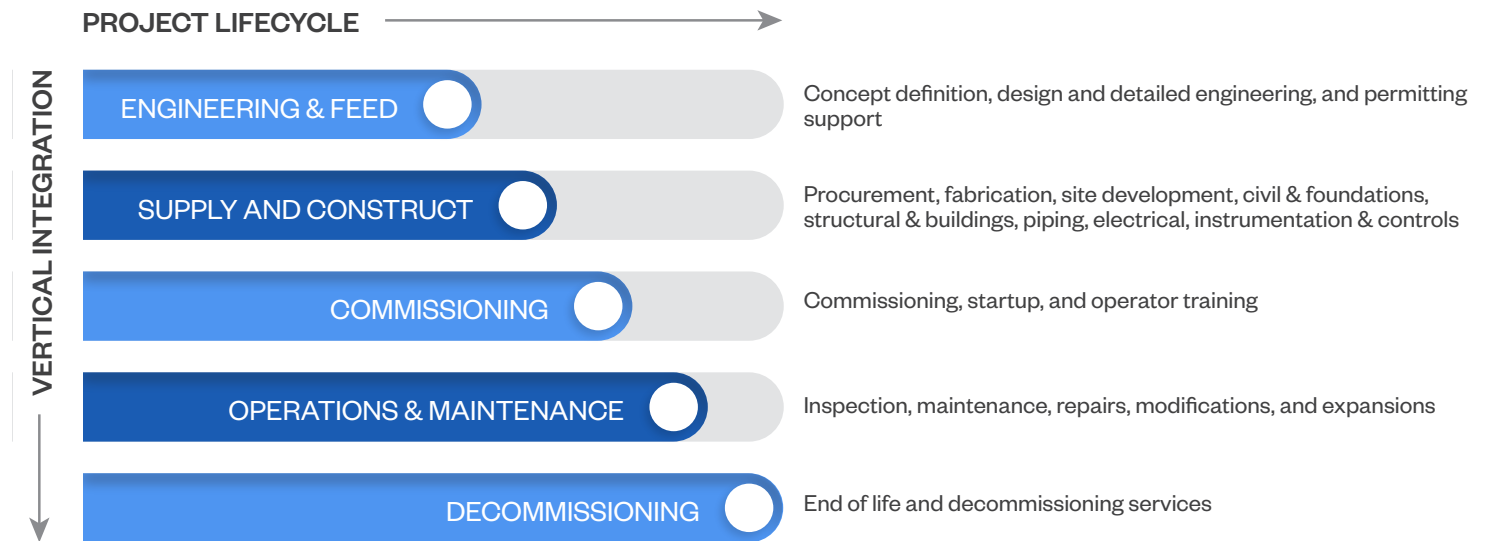
These newer applications are leading to the development of smaller scale liquefaction, storage, and regasification plants, which are far less expensive and can be built more quickly than typical baseload LNG facilities, often using modularized components.

What Defines a SSLNG? Major LNG codes generally define Small Scale LNG Facilities as having a maximum LNG storage capacity of 4000m³ or 1,056,000 gallons and a maximum liquefaction capacity of 2000m³/day or 528,000 gpd. CB&I includes storage volumes up to approximately 46,000m³ or 12 million gallons of LNG in our definition of SSLNG. There is no limitation on vaporization rate.

- LNG is replacing diesel as fuel for high horsepower users including locomotives, heavy trucks and fleet vehicles.
- The use of LNG for power generation is growing in remote areas lacking existing pipeline infrastructure, where LNG can be shipped or trucked.
- The drive to reduce gas flaring in U.S. shale fields is prompting producers to monetize previously flared gas via LNG production.
- The increasing desire by utilities to provide back-up fuel storage via LNG to handle disruptions to the gas supply.

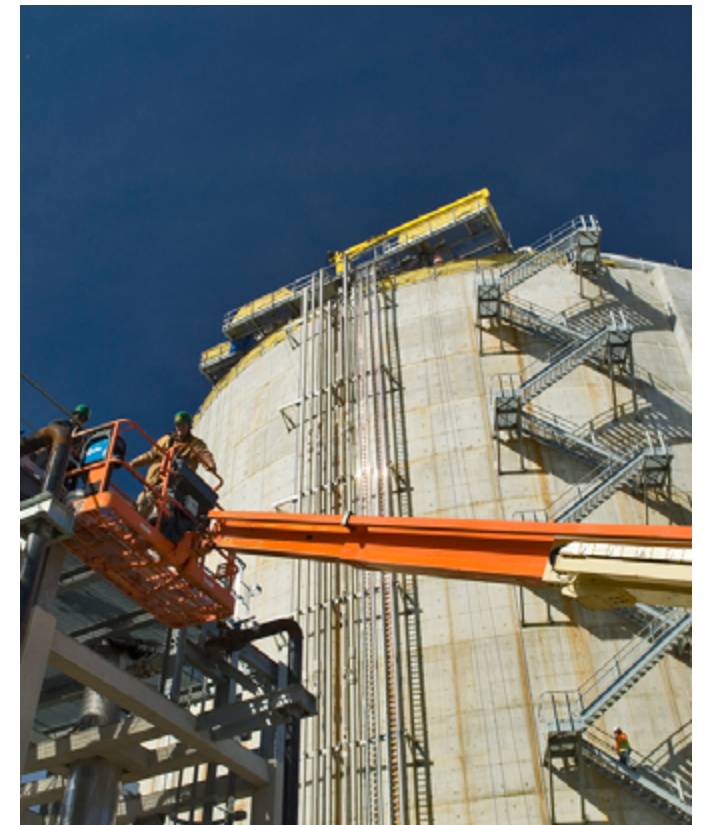
World-Wide, Sole-Source Solution

With more than 60 years of experience in LNG, CB&I is one of the only companies in the industry with the skill set, capabilities and experience to take a small-scale LNG project from pre-FEED to commissioning/startup using solely in-house resources.



What Sets Us Apart

- A strong track record of project execution around the world
- Long-term relationships with vendors, suppliers and fabricators
- Self-perform execution model with engineering, procurement, fabrication and construction
- Start-up, commissioning and operator training capabilities
- Unparalleled design experience for turnkey LNG facilities
- Extensive knowledge of code requirements and regulations, including participation on LNG code committees (USA/Canada/Europe)



A Flexible, Collaborative Approach

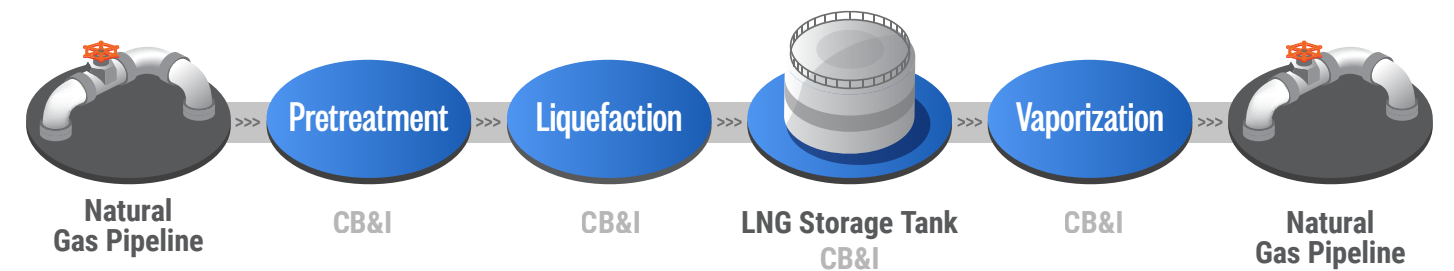
The large-scale LNG industry is dominated by established producers in the oil & gas industry and utility companies buying under long-term contracts. However, the small scale LNG market is far more diverse, with a variety of owners, clients, and applications. Owners may be local utility companies and gasfield producers, port authorities, startups, private equity and venture capital firms, transportation companies and more.

We have the flexibility to provide services throughout the LNG value chain, up to and including delivery of a turnkey EPC solution.

- Comprehensive Capabilities
- Feasibility and FEED studies
- Permitting and siting assistance
- Solutions for gas pretreatment and conditioning
- Liquefaction via expander cycle, mixed refrigerant or nitrogen expansion systems
- Atmospheric and pressurized LNG storage
- Vaporization and send-out systems
- Marine Bunkering
- Truck stations and satellite facilities

CB&I often works with consulting engineers, but we can also serve as an owner's engineer if desired. We can help with siting analysis and plant layouts, as well as providing presentations to municipalities, citizens groups or public utility commissions. Our flexible contracting approach allows us to work under a variety of contract structures, including lump-sum FEED work and a phased contractual approach for project execution.

As an industry leader, CB&I also participates in numerous national and international code committees and LNG industry organizations, and work closely with national regulatory agencies, such as the United States Federal Energy Regulatory Commission, to ensure compliance with applicable codes and standards including NFPA 59A, CSA Z276, EN1473, EN 14620, API 620, API 625, ACI 376 and US DOT 49 CFR Part 193.



Comprehensive In-House Capabilities

CB&I has experienced and dedicated in-house personnel available to efficiently develop liquefier designs, procure equipment and materials, and execute installation and start-up. We can work with our established network of suppliers, or accommodate the owner's preferred equipment suppliers.

CB&I is recognized for having the resources to design and build LNG projects anywhere in the world. We direct-hire and train local field personnel whenever possible, providing a pool of skilled craftsmen who understand our systems and work processes. By self-performing our own work, we can control costs and shorten project schedules — leading to a reduction in our client's risk while ensuring a cost-competitive project. CB&I is committed to safe work practices and maintains one of the best safety records in the industry.

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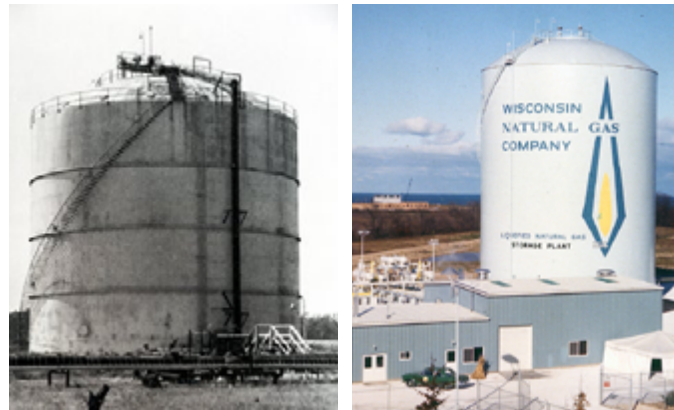
Unparalleled Engineering Expertise

Our process design group has particular expertise in refrigeration and heat transfer and uses state of the art process simulation tools to optimize engineered solutions. In addition, we have developed a number of proprietary processes and technologies that benefit our LNG customers. The development of effective heat and mass

balances and process flow diagrams is assisted by more than 30 in-house design programs. A variety of design and off-design fluid properties are modeled to ensure the selected equipment and process characteristics meet the client's performance expectations.

Our process design group is also responsible for ensuring a plant meets or exceeds environmental and safety requirements. Environmental simulation tools, such as vapor dispersion and thermal radiation modeling software, are used to assist with plant siting and permitting that are instrumental in determining the LNG storage configuration and orientation. Process hazard analysis, including HAZOP and HAZID studies, are embedded in the design methodology resulting in a continuous safety focus on the design of the facility.





A History of Innovation and Industry Firsts

Throughout our history we have been at the forefront of LNG storage and technology, consistently developing innovative cost effective solutions to meet client needs. Our milestones include:

- Designed and built first LNG peak shaving facility in North America
- Designed and built first marine LNG import terminal in North America
- Designed and built the largest peak shaver in North America
- Designed and built the first double wall LNG storage tank
- Designed and built the first full containment LNG storage tank
- Pioneered the use of load bearing foamglass insulation system for inner tank
- Pioneered the use of suspended deck insulation system
- Pioneered the use of resilient blanket to reduce perlite compression
- Pioneered the use of an automatic welder for girth welds
- Pioneered the use of Semi-Automatic UT in lieu of radiographic testing
- Pioneered the technique of air-raising of LNG tanks roofs
- Developed proprietary Mixed Refrigerant Loop (MRL®) liquefaction process

We have been in the forefront of recent trends in the LNG industry requiring engineering solutions that include:

- Feed gas conditioning for high levels of CO₂, O₂, and C6+ heavy hydrocarbons
- Expander refrigeration cycles
- Nitrogen refrigeration cycles
- Mixed Refrigerant Loop (MRL®) cycles



Modular Offerings

CB&I constructs small scale LNG plants using both modular and conventional field construction. Using the modular approach, skid-mounted process modules are built in a controlled factory environment and then transported to the project site where they are installed. Interconnecting piping and ancillary systems are assembled in the field to complete the plant.

In addition to improved quality control and reduced site space requirements, advantages of modularization include:

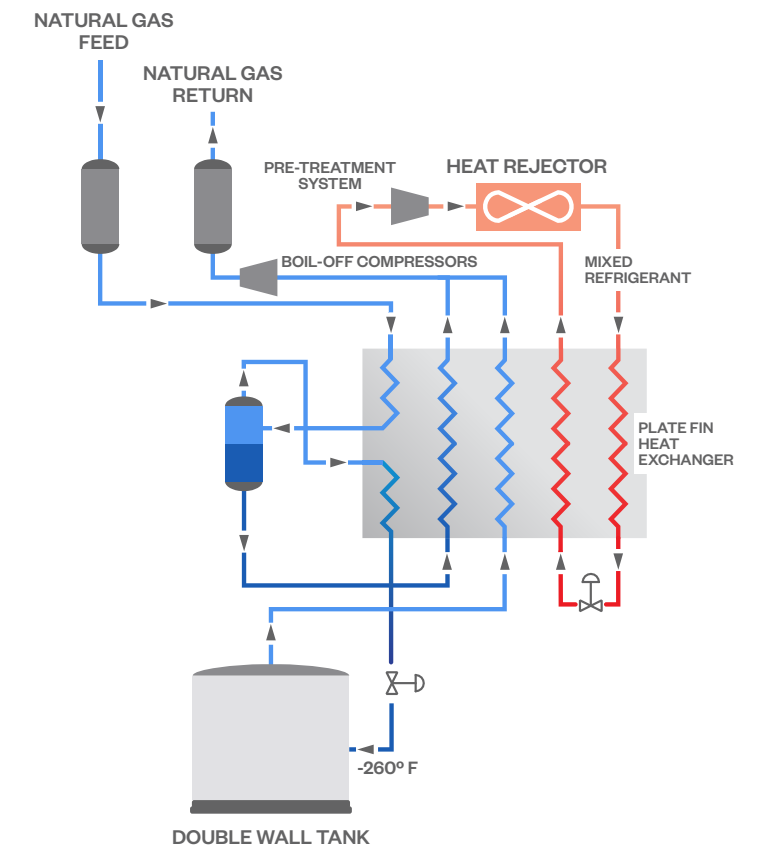
- Integrating design and fabrication shortens project schedules and reduces costs
- Minimizing "in the air" field work results in a safer work site
- Reducing on-site construction minimizes the impact of potential weather delays

Choice of Liquefaction Cycle

CB&I offers multiple liquefaction system technologies for small scale LNG plants:

- Mixed Refrigerant Loop (MRL)
- Nitrogen Expansion
- Expander Cycle

Mixed Refrigerant Loop Cycle (Single MRL Cycle)



■ NATURAL GAS LIQUID	■ MIXED REFRIGERANT LIQUID
■ NATURAL GAS VAPOR	■ MIXED REFRIGERANT VAPOR

CB&I is the world's leading designer and builder of storage facilities, tanks and terminals. With more than 59,000 structures completed throughout our 130-year history, CB&I has the global expertise and strategically located operations to provide our customers world-class storage solutions for even the most complex energy infrastructure projects.

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