

# Proposed liquefied gas projects

The West Coast's increasing appetite for natural gas has led to proposals for five California receiving points, including one as yet unspecified location off the north coast. California consumes an average of 6 billion cubic feet of natural gas per day, 87% of it imported. Project opponents have voiced safety and pollution concerns. Here is a look at where the five California and three Baja California proposals stand:



## Status update

Most of the U.S. offshore projects are in the early stages of federal, state and local review, while the land-based Long Beach Port project follows a different regulatory path. The Mexican facilities appear closer to completion. (Average production capacity is in cubic feet per day.)

## In California

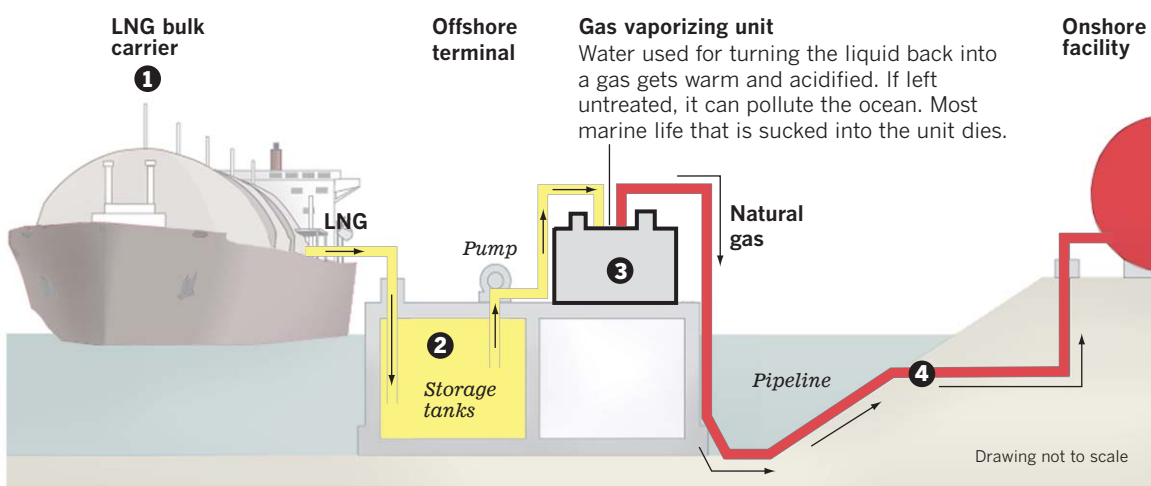
| Project, operating year | <b>A</b> Clearwater Port, 2009                                       | <b>B</b> Cabrillo Deepwater Port, 2010  | <b>C</b> OceanWay, 2011  | <b>D</b> Long Beach, 2011   | Pacific Gateway, (year unspecified)   |
|-------------------------|--|---|--|---|---|
| Companies and sites     | NorthernStar Natural Gas, 12.6 miles west of Oxnard                  | BHP Billiton, 21 miles southeast of Port Hueneme  | Woodside Energy, 21.8 miles south of Point Dume, 23.5 miles west of Palos Verdes Peninsula     | Sound Energy Solutions, Conoco-Phillips, Mitsubishi, at Port of Long Beach  | Excelerate (Northern California)  |
| Capacity                | 1.2 billion  | 800 million - 1.5 billion   | 800 million - 1.6 billion  | 800 million, plus liquid vehicle fuel   | (unspecified)   |
| Cost                    | (unspecified)  | \$800 million   | (unspecified)  | \$450 million   | (unspecified)   |
| Type                    | Converted oil platform, no onsite storage, ambient air vaporizer     | Floating terminal, distilled water bath vaporizer   | Buoy links ship to pipeline. No terminal; no storage; no seawater in ship's warm air vaporizer | Terminal with storage on 25 acres; no seawater in closed circuit vaporizers   | Floating terminal   |
| Status                  | Plans to submit revised U.S. deepwater port application this summer. | Application submitted and draft environmental reports prepared. Final environmental reports may be ready by early summer. | Plans to file U.S. deepwater port application this summer.                                     | Environmental impact drafts prepared. California Coastal Commission and U.S. Coast Guard to consider other forms. Final environmental reports may be ready by fall. | Plans to file U.S. deepwater port application this year, prior to drafting of environmental impact reports. |

## In Baja California

| Project, operating year | <b>E</b> Mar Adentro de Baja California, 2008   | <b>F</b> Moss Maritime Project, 2007  | <b>G</b> Energia Costa Azul, 2008  |
|-------------------------|---|---|--|
| Companies and sites     | Chevron, just off Coronado Islands  | Moss Maritime; Terminales y Almacenes Maritimos de Mexico, 5.3 miles west of Rosarito | Sempra Energy, 14 miles north of Ensenada  |
| Capacity                | 700 million   | 297 million   | 1 billion  |
| Cost                    | \$650 million   | \$55 million  | \$875 million  |
| Type                    | Storage and seawater vaporizers on offshore concrete island   | Floating storage and vaporizers   | Receiving terminal with open rack seawater vaporizers on 400-acre site                                     |
| Status                  | Planned use of seawater for vaporizing unit prompted an environmental challenge. It has cleared three key Mexican authorizations. | Plan has Mexican environmental clearance and needs two more key authorizations.       | Under construction. Company is working to resolve remaining court challenges and has received all permits. |

## Maritime transfer

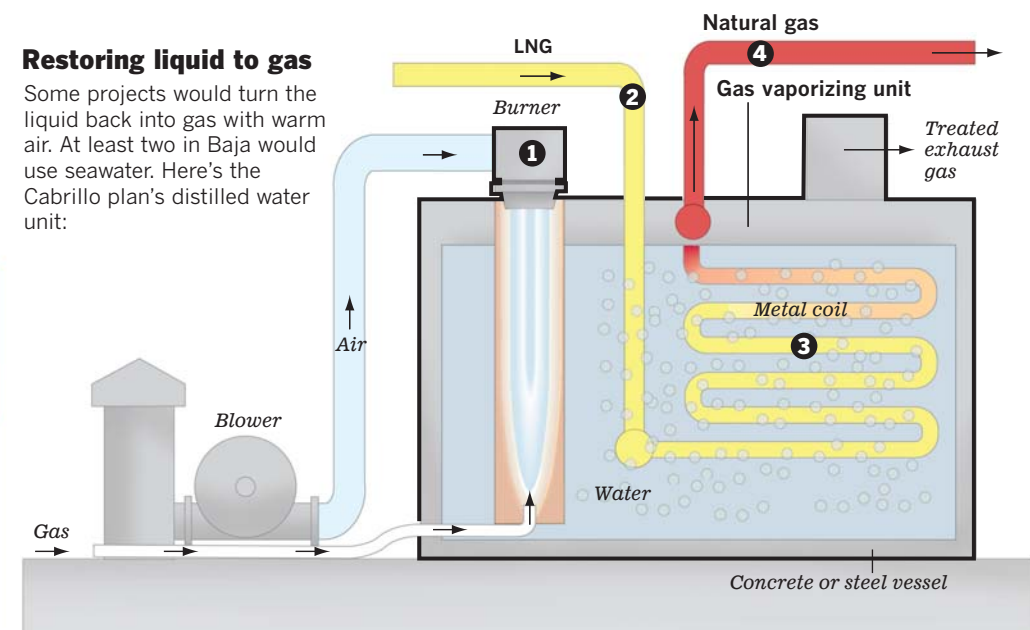
For safety, receiving terminals are sometimes built on the ocean floor, while others use anchored vessels and one plan would hook arriving shipments directly to a pipeline. Processing of the flammable fuel is similar:



1. Liquefied natural gas arrives by ship.
2. LNG is offloaded into storage tanks.
3. LNG is converted from its chilled liquid form to natural gas.
4. Natural gas is carried by pipeline to an onshore facility.

## Restoring liquid to gas

Some projects would turn the liquid back into gas with warm air. At least two in Baja would use seawater. Here's the Cabrillo plan's distilled water unit:



1. Burner heats water.
2. Pressurized liquid fuel is piped to a metal coil.
3. Heat turns LNG into gas.
4. The gas is treated and piped to utility.