

# Flame

## Global LNG Summit Amsterdam

Octávio M. C. Simões  
President

8 May 2017

### Around The World: Supply



This report contains statements that are not historical fact and constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These statements can be identified by words like “derived,” “relationship,” “anticipates,” “plans,” “estimates,” “projects,” “forecasts,” “contemplates,” “assumes,” “intends,” “depends,” “should,” “could,” “would,” “will,” “confident,” “may,” “potential,” “possible,” “proposed,” “target,” “pursue,” “goals,” “outlook,” “maintain,” or similar expressions, or discussions of guidance, strategies, plans, goals, opportunities, projections, initiatives, objectives or intentions. Forward-looking statements are not guarantees of performance. They involve risks, uncertainties and assumptions. Future results may differ materially from those expressed in the forward-looking statements. Forward-looking statements are necessarily based upon various assumptions involving judgments with respect to the future and other risks.

Factors, among others, that could cause our actual results and future actions to differ materially from those described in our forward-looking statements include: local, regional, national and international economic, competitive, political, legislative, legal and regulatory conditions, decisions and developments; actions and the timing of actions, including general rate case decisions, new regulations, issuances of permits to construct, operate and maintain facilities and equipment and to use land, franchise agreements and licenses for operation, by the California Public Utilities Commission, California State Legislature, U.S. Department of Energy, California Division of Oil, Gas, and Geothermal Resources, Federal Energy Regulatory Commission, Nuclear Regulatory Commission, California Energy Commission, U.S. Environmental Protection Agency, Pipeline and Hazardous Materials Safety Administration, California Air Resources Board, South Coast Air Quality Management District, Mexican Competition Commission, cities and counties, and other regulatory, governmental and environmental bodies in the United States and other countries in which we operate; the timing and success of business development efforts and construction, maintenance and capital projects, including risks in obtaining, maintaining or extending permits, licenses, certificates and other authorizations on a timely basis and risks in obtaining adequate and competitive financing for such projects; the resolution of civil and criminal litigation and regulatory investigations; deviations from regulatory precedent or practice that result in a reallocation of benefits or burdens among shareholders and ratepayers, and delays in regulatory agency authorization to recover costs in rates from customers; the availability of electric power, natural gas and liquefied natural gas, and natural gas pipeline and storage capacity, including disruptions caused by failures in the North American transmission grid, moratoriums on the ability to withdraw natural gas from or inject natural gas into storage facilities, pipeline explosions and equipment failures; energy markets; the timing and extent of changes and volatility in commodity prices; and the impact on the value of our natural gas storage and related assets and our investments from low natural gas prices, low volatility of natural gas prices and the inability to procure favorable long-term contracts for natural gas storage services; risks posed by decisions and actions of third parties who control the operations of investments in which we do not have a controlling interest, and risks that our partners or counterparties will be unable (due to liquidity issues, bankruptcy, or otherwise) or unwilling to fulfill their contractual commitments; capital markets conditions, including the availability of credit and the liquidity of our investments, and inflation, interest and currency exchange rates; cybersecurity threats to the energy grid, natural gas storage and pipeline infrastructure, the information and systems used to operate our businesses and the confidentiality of our proprietary information and the personal information of our customers and employees; terrorist attacks that threaten system operations and critical infrastructure; and wars; the ability to win competitively bid infrastructure projects against a number of strong competitors willing to aggressively bid for these projects; weather conditions, natural disasters, catastrophic accidents, equipment failures and other events that may disrupt our operations, damage our facilities and systems, cause the release of greenhouse gasses, radioactive materials and harmful emissions, and subject us to third-party liability for property damage or personal injuries, fines and penalties, some of which may not be covered by insurance or may be disputed by insurers; disallowance of regulatory assets associated with, or decommissioning costs of, the San Onofre Nuclear Generating Station facility due to increased regulatory oversight, including motions to modify settlements; expropriation of assets by foreign governments and title and other property disputes; the impact on reliability of San Diego Gas & Electric Company's (SDG&E) electric transmission and distribution system due to increased amount and variability of power supply from renewable energy sources and increased reliance on natural gas and natural gas transmission systems; the impact on competitive customer rates of the growth in distributed and local power generation and the corresponding decrease in demand for power delivered through SDG&E's electric transmission and distribution system; the inability or determination not to enter into long-term supply and sales agreements or long-term firm capacity agreements due to insufficient market interest, unattractive pricing or other factors; and other uncertainties, all of which are difficult to predict and many of which are beyond our control.

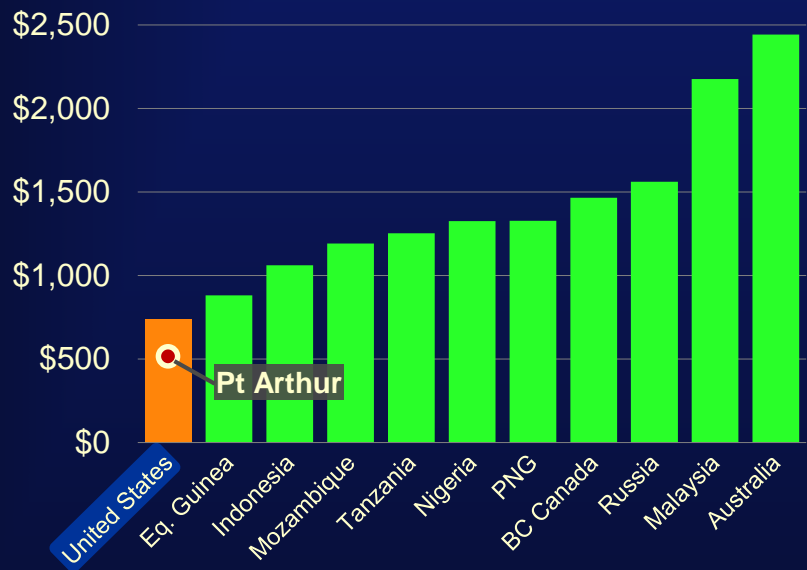
These forward-looking statements speak only as of the date of this report and the company undertakes no obligation to update or revise these forward-looking statements, whether as a result of new information, future events or otherwise. These risks and uncertainties are further discussed in the reports that Sempra Energy has filed with the Securities and Exchange Commission. These reports are available through the EDGAR system free-of-charge on the SEC's website, [www.sec.gov](http://www.sec.gov), and on the company's website at [www.sempra.com](http://www.sempra.com).

- **Minimum Greenfield Project Scale:**
  - Scale Required to Support Ancillary Facility Costs (pipeline, marine facilities, tanks etc.)
  - Reducing Mid-scale \$/tonne requires Multiple Trains for Economies of Scale (including pretreatment)
  - Tipping Point is 8-10 mtpa for Overall Project Cost \$/tonne range
- Mid-scale Project Capex is Higher \$/tonne than Large-scale
- Mid-scale Fixed & Variable Opex is Higher \$/tonne than Large-scale
  - Higher Equipment Count & Associated Spares
  - Increased Manpower & O&M Facilities
- Mid-scale is Less Efficient with Site Space than Large-scale
- LNG Storage Tanks & Marine Works will Always be Greenfield Critical Path
- Mid-scale “Farms” have Never taken FID or been Built
- Mid-scale Project Turn Down is Better than Large-scale
- Large-scale is More Efficient, which Lowers Total Cost

# US Liquefaction & Project Landscape

- US LNG projects expected to play critical role in global energy balance & US economy, as they are most economic incremental supply option
- Launching oil-indexed LNG projects in prevailing price environment a major challenge

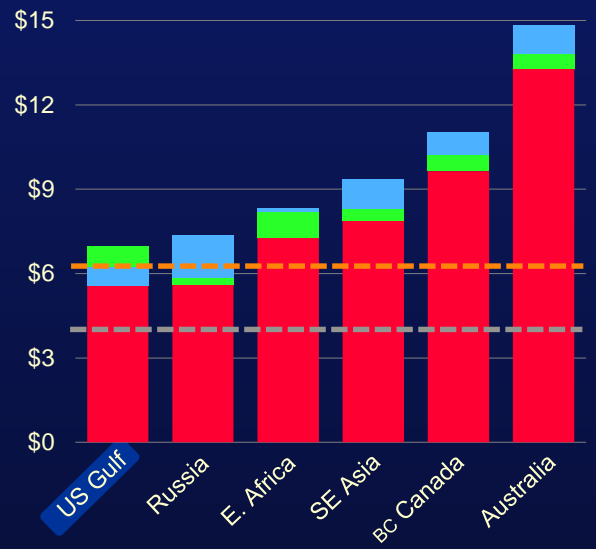
Liquefaction Project Development Costs (US\$/tpa)



**LNG Prices**

- Weighted Avg FOB Price
- to UK
- to Japan
- @ \$70/bbl oil
- @ \$50/bbl oil

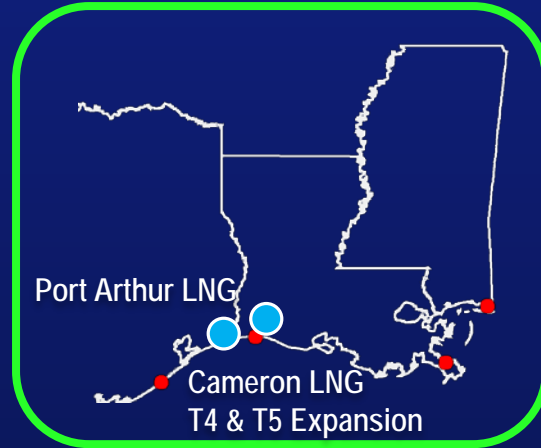
Delivered Supply Costs (US\$/MMBtu)

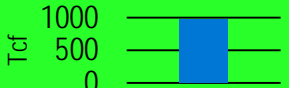

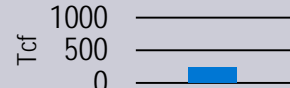


Source: Wood Mackenzie, LNG Outlook Q4 2016

- Capex is unlevered, weighted-average of proposed & under construction projects in each country, does not include integrated upstream or midstream projects, assumes cost over runs & COD delays.
- USGC FOB Breakeven Price assumes long-run Henry Hub price of US\$3.0/MMBtu (2016 real terms) & Brent price of \$70/bbl
- LNG price at \$70/ bbl & \$50/bbl Brent price assumes 0.148 slope

# US LNG Next Wave: Feed Gas Differentiators

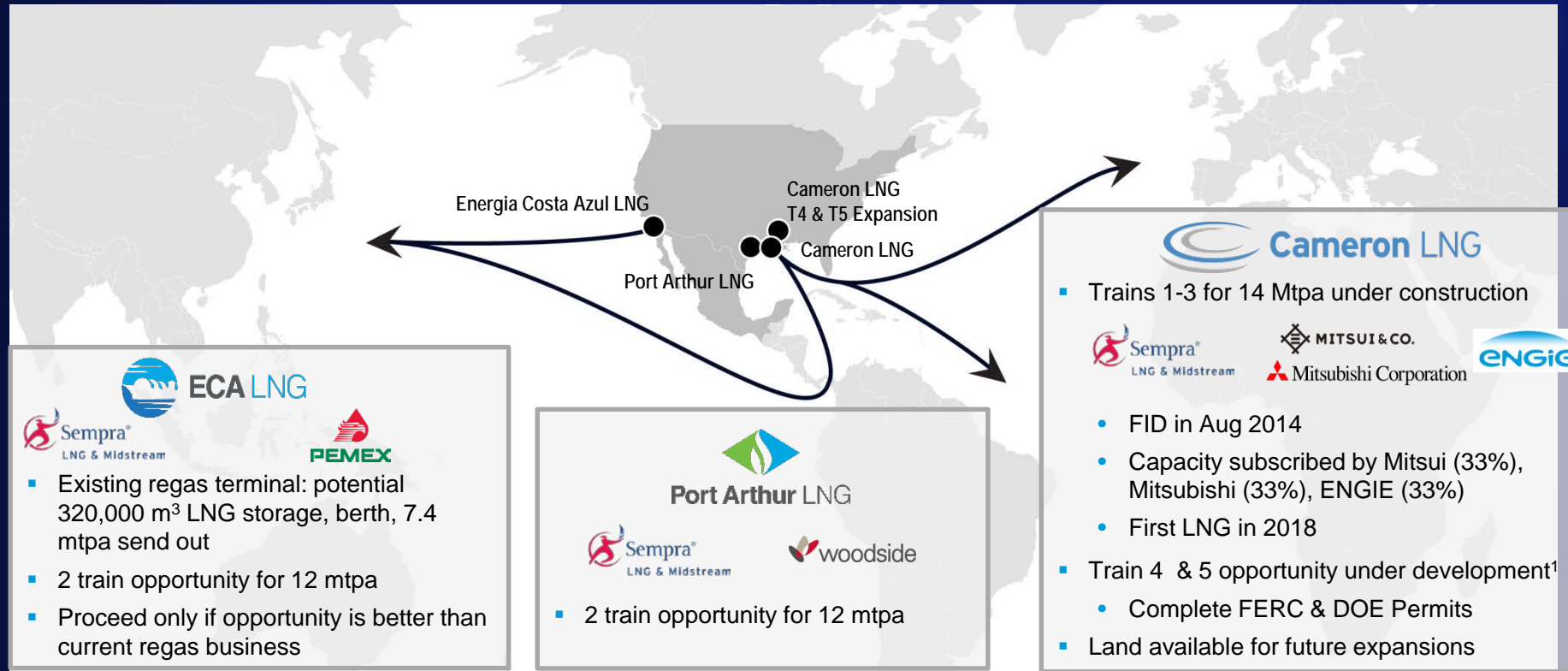


Feed Gas Category	US Gulf Coast	South Texas	US West Coast
Access to low-cost gas resource <sup>\1</sup>	 <p>1000 500 0</p> <p>Northeast / Haynesville / Mid-Continent / Barnett</p>	 <p>1000 500 0</p> <p>Eagle Ford / Permian</p>	 <p>1000 500 0</p> <p>Rockies / WCSB</p>
Feed Gas Basis Volatility <sup>\2</sup>	<p>Henry Hub: 53%</p> <p>Delhi: 53%</p> <p>Eunice: 52%</p>	<p>Agua Dulce: N/A - illiquid</p> <p>South Texas*: 54%-56%</p> <p>Waha: 75%</p>	<p>Opal: 87%</p> <p>Kingsgate: 65%</p> <p>Malin: 74%</p>
Market Liquidity	High	Low (Agua Dulce) / Moderate (South Texas / Waha)	Moderate
Pipeline Transportation Costs	Low	High	High Political Risk
Natural Gas Storage	High deliverability salt caverns	Line-pack Operational Constraint	Line-pack Operational Constraint

<sup>\1</sup> Wood Mackenzie <\$4/MMbtu and \$70/BBl breakeven price

<sup>\2</sup> ICE. Annualized Spot Volatility 2009 to April-2017. South Texas includes NGPL STX, TGP Z0 and TETCO STX





Subject to reaching agreement with partner

The ability to successfully complete major construction projects, including the Cameron LNG facility currently under construction, is subject to a number of risks and uncertainties. Please refer to the "Risk Factors" and "Factors Influencing Future Performance" sections of our most recent Annual Report on Form 10-K for a description of the risks and other factors associated with this opportunity.