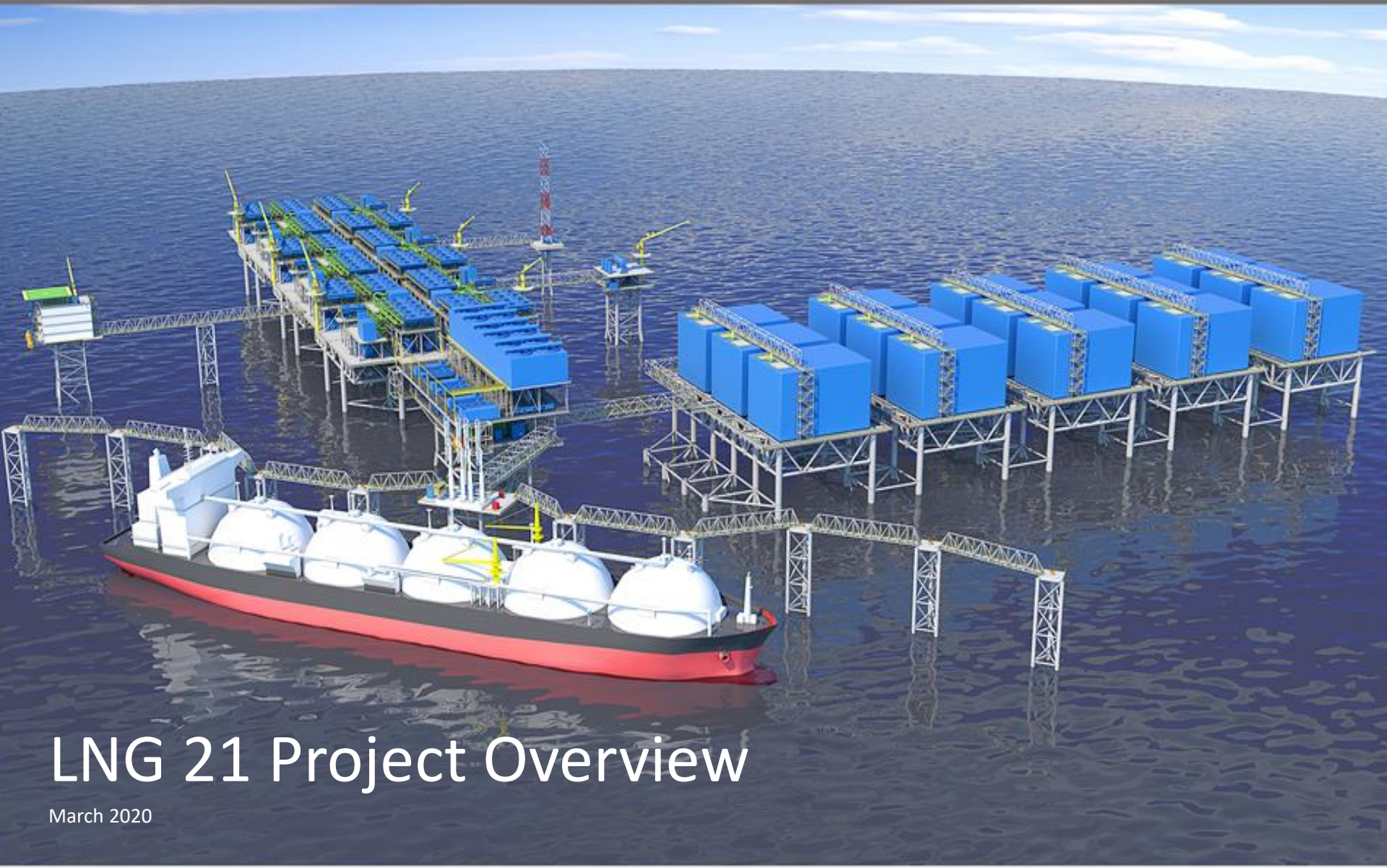
WEST DELTA LNG, LLC – LNG EXPORT DEEPWATER PORT

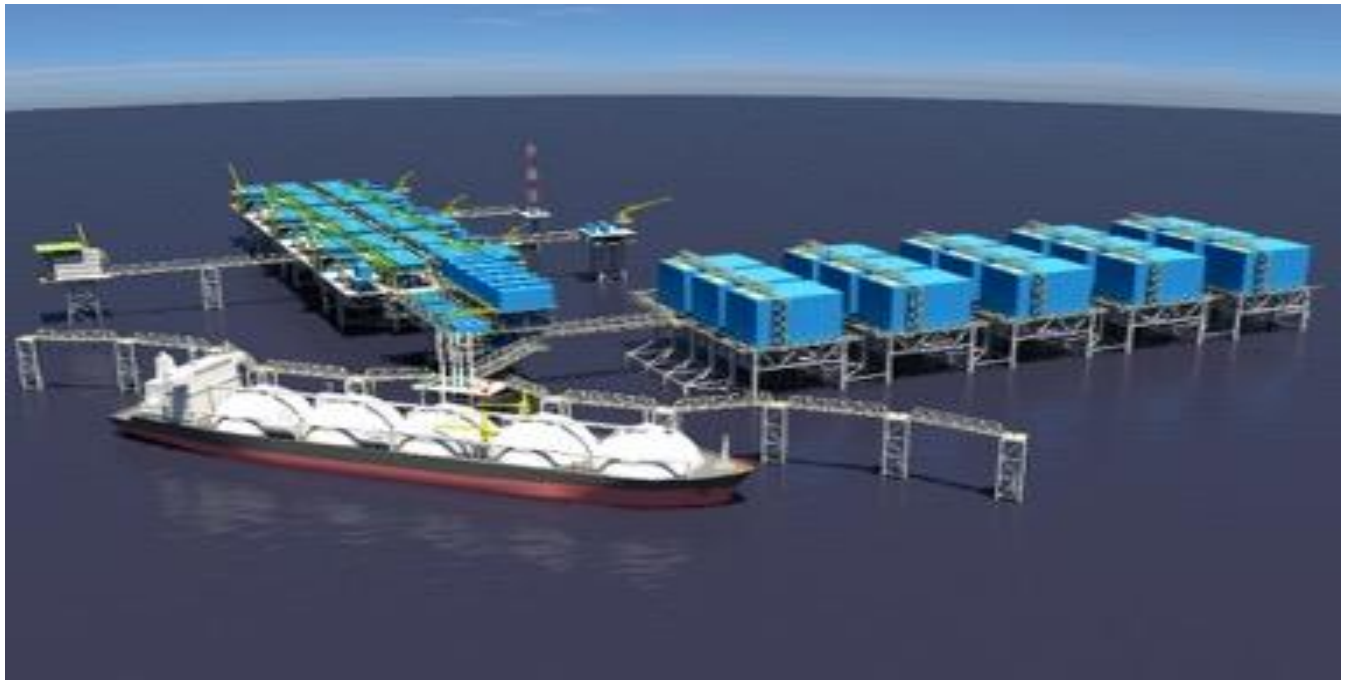


LNG 21 Project Overview

March 2020

LNG Export - Deepwater Port Design with ABS AIP

Deepwater Port Solution



Shore-side Facility Challenges:

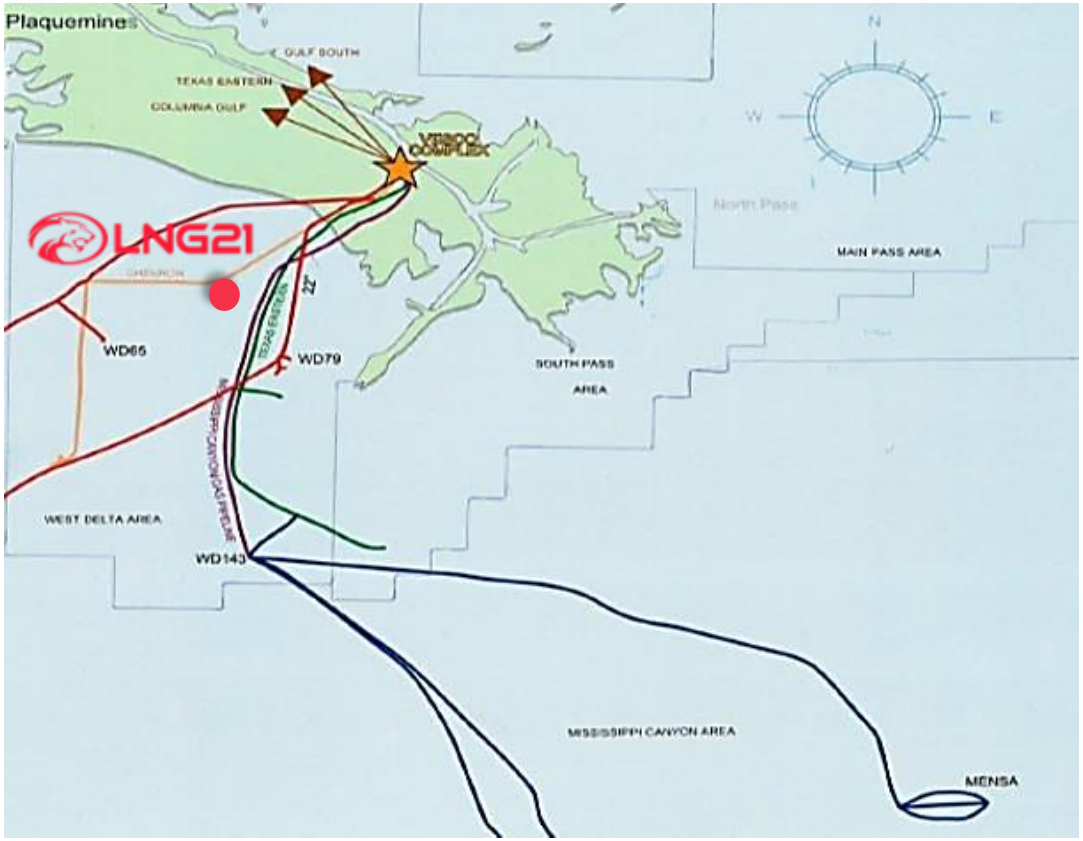
- Coastal wetlands, tidal surge, drainage, pipeline access
- Jetty, breakwater, dredging, harbor development
- Channel access and delays due to weather, channel traffic and port/waterway regulations

Offshore Deepwater Port:

- Remote from populated areas and active shipping lanes, plus dedicated anchorage
- No dredging required due to 15-20 meter water depths
- Gas pre-treatment co-located at existing onshore gas processing plants already serving platforms offshore

West Delta Site & Onshore Venice Gas Plant

- ✓ Strategic Positioning:
  - ❖ 11 miles from WD 44
- ✓ Connected Pipeline Capacity
  - ❖ Texas Eastern 1.2 Bcf/d
  - ❖ Columbia .2 Bcf/d
  - ❖ Gulf South .6 Bcf/d
  - ❖ Potential Connection to Tennessee Pipeline 1.8 Bcf/d
  - ❖ Native Venice Gas Supply ~ .4 Bcf/d
- ✓ Secured Pipeline Outlet for Recovered NGLs and Condensate



Infrastructure Development Plan Highlights

- **Infrastructure to be upgraded to supply liquefaction-ready natural gas volumes delivered to six offshore LNG production trains with peak production potential of 6.1 Mtpa of LNG**
- **New dedicated 20-mile pipeline to transport pretreated gas from onshore facilities to the LNG production platforms**
- **900 MMcf/d gas capacity delivered to LNG production platforms at 1,000 psig**
- **Onshore pre-treatment and compression to be located near existing processing plant**

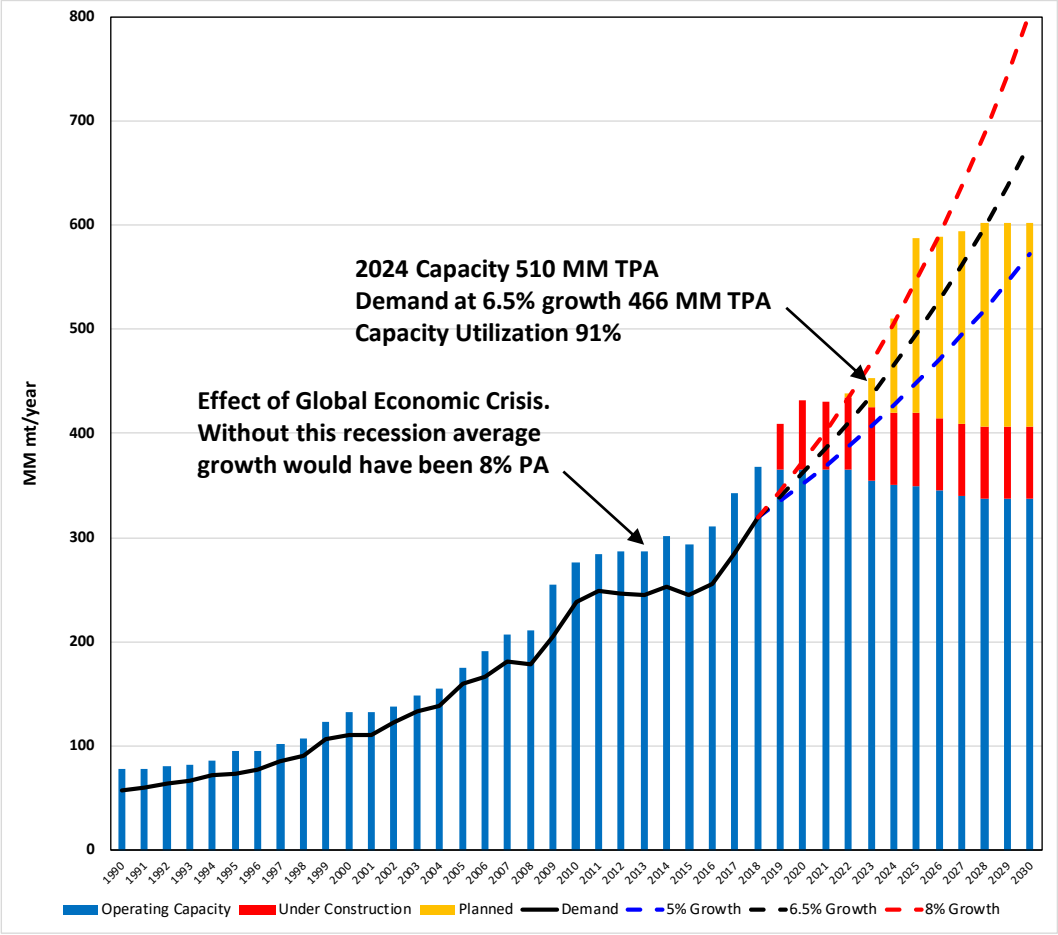
Deepwater Port Turn-Time

- The LNG 21 facility will be located 12 miles offshore in 15-20 meters of water, away from heavy marine traffic and with a dedicated anchorage.
- It is estimated to take less than one hour from the moment an LNG carrier arrives at the anchorage and has its pilot on board, to being moored at the dock ready for loading.
- LNG Exporters in inland waterway systems under the best of circumstances will face half a day in transit time.
- Channels serving multiple bulk facilities, container ports, or cruise ship terminals will experience congestion, which will result in minimum required safety distances, tug scheduling, and other delays. These delays may become extreme during a weather event.

Plant	MM TPA	ships/d[1]	Inland (nm)	Channel (nm)	Passage (h)[2]
Cameron	15.0	0.55	17	20	6.8 x 2
Lake Charles	15.0	0.55	22	20	8.0 x 2
Magnolia	8.0	0.29	21	20	7.7 x 2
Driftwood	27.6	1.01	20	20	7.5 x 2
Total	65.6	2.4			

1) Based on an average cargo size of 170,000 m3
2) Assuming a speed of 4 knots in the river and 8 knots in the channel

Global Supply & Demand 1990 - 2030



If the historical growth of 6.5% p.a. continues, by the time West Delta comes on-stream (2023 & 2024), capacity utilization will be around 90% and new capacity will be needed to satisfy demand.

- Average demand growth over the period 1990 – 2018 has been 6.5%
- Projects under construction included in supply forecast:

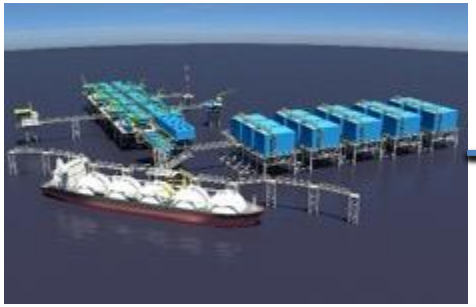
Project	MM TPA	Year
Freeport T1	5.00	2019
Corpus Christi T1 - T2	9.00	2019
Sabine Pass T5	4.50	2019
Vysotsk T1	0.33	2019
Elba Island T5 - T6	1.26	2019
Cameron T1 -T3	13.50	2019
Yamal T2	5.50	2019
Corpus Christi T3	4.50	2019
Tangguh Phase 2 T3	3.80	2020
Portovaya	1.50	2020
Yamal T3	5.50	2020
FNLG Dua	1.50	2020
FLNG Mozambique	3.40	2022
	59.3	

- Pre-FID Projects included in the supply forecast:

Project	MM TPA	Year
Sabine Pass T6	4.50	2022
Magnolia T1 - T4	8.00	2023
Cameron T4 - T5	9.00	2023
Vysotsk T2	0.33	2023
Freeport T4	5.00	2023
Woodfibre	2.10	2023
Calcasieu Pass T1 - T10	10.00	2024
Rio Grande T1 - T2	9.00	2024
PNG LNG T3 - T4	6.90	2024
Gulf LNG T1	5.00	2024
Lake Charles T1 - T2	10.00	2024
Texas LNG T1	2.00	2024
LNG Canada T1 - T2	14.00	2024
Driftwood T1 - T8	11.04	2024
Delfin FNLG	6.50	2025
Lake Charles T3	5.00	2025
PNG LNG T5	3.45	2025
Gulf LNG T2	5.00	2025
Texas LNG T2	2.00	2025
Golden Pass T1 - T3	15.60	2025
Abadi T1 - T3	9.60	2025
Jordan Cove T1 - T5	8.80	2025
Mozambique T1 - T4	20.00	2025
Driftwood T9 - 12	5.52	2026
Kitimat T1 - T2	10.00	2027
Driftwood T13 - T16	5.52	2028
	193.9	

Sources: IGU Report 2018, Shell Outlook 2019, company websites

LNG 21 – Project Participants



- Management — LNG21
- Operator — COX
- Midstream — UOP
- Owners / Engineers — BRAEMAR
- EPCM — wood.
- Turn-key — 海油工程 COOEC
- Technology — Baker Hughes
- Concept — HH EnTX LLC

Cox – Operator of Record

Cox is an established, privately owned, independent oil and gas company founded by fourth-generation oilman Brad E. Cox. The Company owns and operates assets in the Gulf of Mexico.

Since its inception in 2004, the Company has grown through the strategic acquisition and revitalization of mature oil and gas fields located in both the Outer Continental Shelf and the shallow waters off the coast of Louisiana. Cox recently acquired the principal assets of Energy XXI.

The MARAD Process: 1 year

Step 1: Day 0-26	Application submittal (notice of Application issued on day 26)
Step 2: Day 27-63	Notice of Intent to prepare Environmental Impact Statement is issued and scoping begin
Step 3a: Day 64-151	Draft Environmental Impact Statement is published
Step 3b: Day 152-197	Public comments on Draft Environmental Impact Statement
Step 3c: Day 198-251	Final Environmental Impact Statement
Step 3d: Day 252-266	Final public hearing
Step 4: Day 267-311	Governor of adjacent coastal state and federal agency comment period
Step 5: Day 312-356	Marine Administration issues a Record of Decision for the Environmental Impact Statement

MARAD Permitting

- U.S. Maritime Administration ("MARAD") handles all Deepwater Port applications
- MARAD approval has a defined 356-day time limit as per U.S. law
- Offshore licensing can run concurrently with fabrication
- Deepwater Port permit filed Aug. 28, 2019
- Public hearing held Oct. 29, 2019
- Process paused on day 77 for data gaps

Free Trade Agreement Export License

- FTA Export License approved within 90 days as defined by U.S. law

Key Takeaways

- Highly competitive CAPEX, OPEX and time to commissioning compared to onshore greenfield projects
- Conventional fixed production platform and liquefaction technology is standardized, modularized and scalable
- Downtime due to weather or met-ocean conditions reduced by site selection and by using conventional fixed loading berth and storage platform design
- Offshore LNG production facility has been designed for severe marine environmental conditions making for faster return to LNG production intervals following major storm events
- MARAD Review process outsourced to pre-qualified consultants
- LOI already signed for 100% of initial terminal capacity
- Experienced CEO and team with decades of experience in the offshore industry
- Operator of record with the largest Gulf of Mexico shelf operations