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Term: Quarterly

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 - Renewable Energy
 - LNG & Energy Infrastructure
 - Marine & Equipment Leasing
- **Energy & Utility Project Research:**
 - Satellite & drone imagery, analysis of key updates and market changes – *differentiated depth*.
 - **W|EPC Project Database:** key cost, timeline, & regularly data - *cutting through the clutter*.
 - Independent project timeline & budget analysis - *identifying issues before the market*.
 - Highlighted variance between *company guidance* and *EPC reality* – *before the surprise*.

Full Research Library Access:

- Access to our full **Research Library** (via *Bluematrix* & secure data rooms).
- Includes all previous reports, presentations, satellite imagery, and other resources.
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- Our *multi-factor* LNG S/D model – which probability weights +100 projects

On-Demand Analyst Access:

- On-demand access to our New York & Houston analyst teams for questions, conference calls.
- Access to our team of Engineers for technical expertise.
- Bespoke sensitivity analysis & project work.
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<ul style="list-style-type: none"> • Footprint In Solar, Wind, Biofuels, & Energy Storage • Coverage Of Misunderstood And Under-Covered SMID Names • Expansion & Deep-Dives Into Solar And Wind Value Chains • Energy Transition In Frontier States • Webber R A Renewable Energy Weekly 	<ul style="list-style-type: none"> • Coverage Of The Entire LNG Supply Chain • Multi-Factor Probability-Weighted Supply/Demand Models • Global LNG Project Rankings • Gas-To-Power • Small-Scale LNG • LNG Buyer Book • Webber R A LNG Weekly 	<ul style="list-style-type: none"> • Salient Data, Read-Throughs • IMO 2020 Progress • Crude/Product Tanker Rates & Asset Values • U.S. Oil Movements • Containerized Trade & Box Leasing Analysis • LPG Rates & Asset Values • Detailed Inland & Coastal Barge Color • Inland Barge Spot & Term Pricing 	<ul style="list-style-type: none"> • Capital Markets & Deal Consulting • Asset Level & Bespoke Valuations • Fairness Opinions • Capital Connections & IR Consulting • Board Presentations & Market Research • EPC Due Diligence • Technical Project Consulting 	<ul style="list-style-type: none"> • Long-Term Due Diligence • Valuation Framework: Current & Historical Comps, Asset Level Valuations, Etc. • Relevant Research & Updates • Global Context, Market Outlooks & Sector Themes, Competitor Analysis, Public & Private Comps • Supply/Demand Dynamics 	<ul style="list-style-type: none"> • Sempra Energy (SRE) • Southern Company (SO) • Dominion (D) • American Electric Power (AEP) • CenterPoint Energy (CNP) 	<ul style="list-style-type: none"> • Enbridge (ENB) • Enterprise Product Partners (EPD) • Energy Transfer (ET) • Kinder Morgan (KMI) • Exxon (XOM) • Total S.A. (TOT) • Shell (RDS) 	<ul style="list-style-type: none"> • LNG Canada – Shell • Calcasieu Pass – Venture Global • Plaquemines – Venture Global • Driftwood – Tellurian • Rio Grande – NextDecade • Cameron (T1-3) – Sempra • Commonwealth LNG • Golden Pass – Exxon, Qatar Petroleum • Annova LNG - Exelon • Costa Azul LNG - Sempra • Tortue FLNG • <i>And Many More</i>


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W EPC: Energy Transfer (ET) Capital Project Monitor - Q220	EXP	Michael Webber, CFA	Industry Note	Jun 04 2020 10:52AM	<input type="checkbox"/>
ENS: Tepid FY21 Commentary As COVID Continues To Shroud NT Outlook	ENS	Michael Webber, CFA	Company Note	Jun 03 2020 08:00AM	<input type="checkbox"/>
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NVGS: Q1 Miss Overshadowed By Positive Developments With Marine Export Terminal	NVGS	Michael Webber, CFA	Company Note	Jun 01 2020 02:09PM	<input type="checkbox"/>
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LPG: Financing & Sale Leaseback Bolster Liquidity	LPG	Michael Webber, CFA	Company Note	May 28 2020 02:45PM	<input type="checkbox"/>
Webber Research: LNG Weekly	EXP	Michael Webber, CFA	Industry Note	May 27 2020 02:59PM	<input type="checkbox"/>
FRO: Q1 Miss, NT Outlook Remains Strong As Postponed Maintenance Should Reduce Fleet Capacity	FRO	Michael Webber, CFA	Company Note	May 21 2020 12:47PM	<input type="checkbox"/>
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TGP: Blink Twice If You Need Help - Teekay Shakes Down TGP For \$123MM For Long-Shot IDRs	TGP	Michael Webber, CFA	Company Note	May 14 2020 12:31PM	<input type="checkbox"/>
Webber Research: Renewables Weekly	RNW	Michael Webber, CFA	Industry Note	May 13 2020 09:41AM	<input type="checkbox"/>
Venture Global PHMSA Objects to Calcasieu Pass LNG's Storage Tank Design	EPC	Michael Webber, CFA	Industry Note	May 11 2020 03:09PM	<input type="checkbox"/>
Webber: Q1 Earnings Round Up: CAI, DHT, EURN, KEX, GLOG, & GLOP. Lowering CAI To Market Perform	EXP	Michael Webber, CFA	Industry Note	May 10 2020 04:32PM	<input type="checkbox"/>

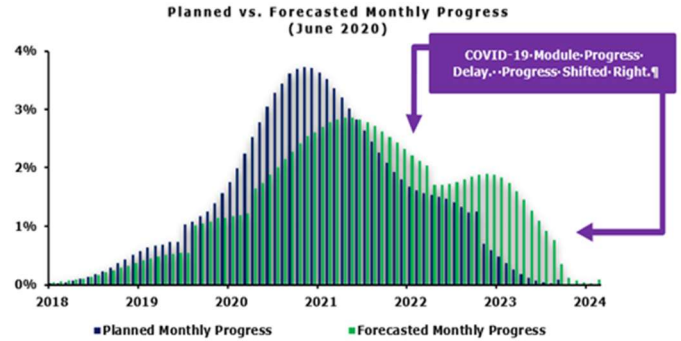
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Project Tracking: Digging Deeper Into Large-Scale Capital Projects

Webber Research identifies potential schedule issues, significant cost overruns, and material deviations from expectations or guidance – **before the surprise.**



High Resolution Satellite Imagery: A More Accurate Picture of Project Progress

We use high-res satellite imagery to support our core research reports to show actual project sites and temporary locations, module yards, parking facilities, storage and laydown facilities – all in an effort to assess actual progress and evolving dynamics.



Capital Project Analysis: Unique Perspective & Analysis of Utility & Energy CAPEX Backlogs

We blend our decades of energy infrastructure, finance, EPC, and commercial experience with deep and thorough analysis of federal and local data bases, economic models, and industry expertise to add unparalleled context and value.

EPD Capital Project Analysis

Existing Projects: PDH #2 Cost Analysis

- PDH #2 is designed to consume up to 35 MBPD of propane and produce 25 MBPD (or 1.65 billion lbs/yr) of polymer grade propylene ("PGP").
- EPD is forecasting the global demand for PGP to continue increasing.
- EPD has provided the following public data:
- PDH #2 will integrate with existing propane and propylene network.
 - FID: October 2019
 - COD: 1H23
 - Total Construction Hours: 11.7MM
 - EPD's total investment: >\$1.2B
- WIEPC estimates:
 - EPC total cost: \$1.32B
 - Construction wage rate: \$54.44/hour (bare rate + burdens & benefits).

WIEPC Estimated Cost Breakdown** (\$MM)		
Description	% of Total Cost	Total Cost
Home Office PMT & Engineering	5.1%	\$67.6
Procurement - Equipment	14.9%	\$196.6
Procurement - Bulk Materials	14.9%	\$196.6
Construction - Directs	48.2%	\$637.0
Construction - Indirects	7.6%	\$100.5
Risk/ Contingency/ Profit	9.3%	\$122.9
WIEPC Total Estimated Cost	100%	\$1,321.2

Key Points
• The total estimated construction craft labor costs is forecasted (55%) to be above standard percentage allocations (~40%).
• Why is EPD's estimated construction hours on PDH #2 (11.7MM) less than their proposed PDH #3 (15.6MM)? If it's essentially the same project; will the additional construction labor costs from PDH #3 need to be added to PDH #2?

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LNG & Utility Project Coverage: Unapparelled Detail & Depth



Southern Company (SO) Vogtle Nuclear Project Quarterly Monitor - Q220

Michael Webber, CFA Managing Partner
Oleg Waszkowski, CFA Associate Partner
Chris Tsung, CFA Associate Analyst
Erio Smith Managing Partner, EPC Risks

WJPEC: Vogtle Quarterly Project Monitor

Construction Progress and Cost Analysis

Construction Costs Continue Increasing

- The project made +23.6% construction progress in 2020 and 2019 (24 months), while having to spend \$721MM more than initially budgeted.
- Between Dec19 and Sep20 (21 months), Vogtle needs to complete all remaining construction activities (~23%) prior to the Unit 4 "Red Lead" milestone (mid-2021).

WJPEC Observations

- Using 2019/20 as a simple, straight-line case, the project would get through the remaining \$160MM of allocated contingency and incur another \$420MM of overage.
- While that's not necessarily an apples to apples comparison as late stage costs can vary, it gives some context.
- It's also worth mentioning that the road gets harder from here, as projects typically have a harder time maintaining schedule near the ~70% completion threshold, which typically signals the transition from bulk construction to commissioning.

Item	Jan-18	Jul-18	Jan-19	Dec-19	Sept-2021 (Unit 4 Fuel Load Test)
Construction Progress Completed	45.5%	55.3%	68.6%	77.1%	100%

Item	Jan-18	Jul-18	Jan-19	Dec-19
Construction Cost Forecasts	\$3,835	\$4,371	\$4,371	\$4,556

\$721MM Increase

The project could be challenged finishing construction by Sept 21 without increasing costs.

WJPEC: Vogtle Quarterly Project Monitor

Georgia Power's Potential Cost Exposure

Project Costs

- Vogtle expansion costs have escalated from the original \$14B (2008) to ~\$27B (2021), after Westinghouse's bankruptcy in 2017, project costs/benchmark were effectively reset - hence we'll be focused primarily on post-2017 changes.
- We've focused on Georgia Power's share of the Vogtle Expansion costs in the adjacent table.
- In Dec 2017, GPSC approved \$7.2B as reasonable total construction costs for GP's share of the Project, above which GP allocated contingency.
- After factoring in GP's portion of the Toshiba PCG credit (\$1,492B), GP's voluntary cost allocation from 2018 (\$194MM), GP has already burned through \$206M (32%) of it's allocated contingency, which may already prove insufficient.
- Including that contingency (\$206M), we believe Georgia Power is already looking at \$1.8B of potential cost overruns, pending eventual review by the GPSC.

Cost Category	2008	2010	2015-16	2017	2018-19	2020-21
Yield Constructive & Capital Costs	\$8,771	\$8,700	\$7,381	\$7,381	\$8,524	\$8,482
Yield AEC Cost Data	\$2,440	\$2,440	\$2,440	\$2,440	\$2,440	\$2,440
GP's share of expansion costs	50%	50%	50%	50%	50%	50%
GP's share of expansion costs	\$4,385	\$4,350	\$3,690	\$3,690	\$4,262	\$4,241
GP's share of expansion costs	\$4,385	\$4,350	\$3,690	\$3,690	\$4,262	\$4,241
GP's share of expansion costs	\$4,385	\$4,350	\$3,690	\$3,690	\$4,262	\$4,241

GP's updated cost overruns already total ~\$2B, before moving into the more difficult commissioning phase

WJPEC: Vogtle Quarterly Project Monitor

February 2020 Re-Baselined Schedule

Status

- The Feb 2020 site work plan is behind the April 2019 baseline plan, which delayed the Cold Hydro Test (CHT) and the Hot Functional Test (HFT) 5 weeks each.
- However, Vogtle Units 3 (May 2021) & 4 (Mar 2022) forecasted in-service dates remain the same and are ~6 to ~8 months ahead of their respective regulatory approved COD dates, Nov 2021 and Nov 2022.

WJPEC Observations

- Construction delays have increased the backend loaded progress needed to meet the Unit 4 Fuel load date. Monthly progress needed is as follows:
 - April 2019 Baseline Plan: 0.4%
 - Feb 2020 Site Work Plan: 0.9%

The remaining shoehorned, backend-loaded schedule will likely be an ongoing problem



Golden Pass LNG April 2020 Project Update

Michael Webber, CFA Managing Partner
Oleg Waszkowski, CFA Associate Partner
Chris Tsung, CFA Associate Analyst
Erio Smith Managing Partner, EPC Risks

WJPEC: Golden Pass LNG April 2020 Update

On-Site Direct Labor Costs Analysis

WJPEC Analysis = \$109MM Direct Labor Cost Increase

- From April 2020 to September 2020, WJPEC believes the Project's increased on-site labor requests added ~\$109MM in labor costs.
- While it is reasonable to assume additional indirect costs were added as well.
- \$109MM could be insignificant in a \$5B EPC LSTK contract, however, when Projects fall behind schedule this early, it tends to snowball...

Type	30-Apr	30-Sep	30-Apr	30-Sep	30-Apr	30-Sep	30-Apr	30-Sep
Estimated Passenger Vehicle Numbers	800	825.7	800	825.7	800	825.7	800	825.7
Estimated Increase From April 2019	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7
Estimated Increase From April 2019	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7
Estimated Increase From April 2019	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7

We Estimate Golden Pass Was Already Looking At ~\$100MM In Labor Overruns, Before COVID-19...

WJPEC: Golden Pass LNG April 2020 Update

Updated EPC Schedule LNG Train #1 - COD January 2025

Golden Pass Monthly Progress Evolution

- We've updated our EPC monthly progress schedule to include Implementation Plans (IP) recently submitted to FERC, increased on-site craft labor forecasts, construction activities, and Chryso's reported project completion percentages (below):
 - June 2019: ~7% complete
 - September 2019: ~4% complete
 - December 2019: ~5% complete
- WJPEC Key Observations:
 - It's unclear whether FERC received/approved the IP's needed to support the increased construction activities in Q4.
 - Given the limited approved IP's to date our progress curve has shifted to the right, and the project could further slip if a progress level don't ramp.
 - At a minimum, we believe 24/7 construction will extend beyond Dec 20, on-site labor will increase, but will it be enough?

Something's Gotta Give: Either Progress Somehow Ramps Considerably Or Costs Rise & The Schedule Slips

WJPEC: Golden Pass LNG April 2020 Update

LNG Liquefaction Trains

WJPEC Observations

- We believe there are the 5 piling rigs located in near LNG Train #1. It is reasonable to assume each piling rig can install ~7 to ~10 piles per day.
- Per regulatory filings, the LNG trains have ~25K piles. If the piles are equally divided among the three trains (8.3K per train), it would take 166 days (21 weeks) for 5 rigs to install 8.3K piles (5 rigs x 10 Piles per Day x 166 days = 8.3K piles).
- According to other, train #1 piling could possibly be done by ~Sept Oct 20... then onto underground piling (i.e. foundation, site drainage) and foundations.

LNG Liquefaction Trains Plot Plan

WJPEC Observation

- The piling rigs are planned to operate seven days a week, 6:30 AM to midnight after sunset; therefore, there is minimal, if any, schedule contingency (i.e. weather risks, engineering delay, material, quality issues, etc).

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Webber Research: Multi-Factor LNG Supply & Demand Model



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Vertical LNG

Updated Thesis & Global Project Rankings
October 2019

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Webber R|A: Vertical LNG – Supply & Demand Model

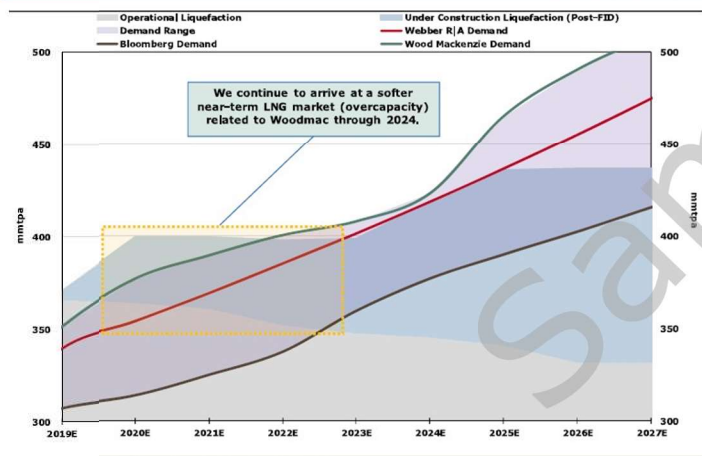


Supply/Demand Model		Our Regional and Facility Assumptions																																																																																																																																																																																		
Our Vertical LNG Supply/Demand Model utilizes 3-stage growth rates for 4 global LNG sinks, and builds up Emerging Market (EM) demand by probability-weighting 111 separate Regas/FSRU projects.																																																																																																																																																																																				
Assumptions/Changes		<table border="1"> <thead> <tr> <th colspan="2">Control Panel</th> <th colspan="2">Next 2 Yrs</th> <th>Next 5 Yrs</th> <th>Long-Term</th> </tr> </thead> <tbody> <tr> <td>Regional Utilization Growth Rate</td> <td></td> <td>3.0%</td> <td>4.0%</td> <td>4.5%</td> <td>4.5%</td> </tr> <tr> <td>Asia (non-China)</td> <td></td> <td>3.0%</td> <td>4.0%</td> <td>4.5%</td> <td>4.5%</td> </tr> <tr> <td>China</td> <td></td> <td>3.5%</td> <td>4.5%</td> <td>5.0%</td> <td>5.0%</td> </tr> <tr> <td>EU 28</td> <td></td> <td>3.0%</td> <td>4.0%</td> <td>4.5%</td> <td>4.5%</td> </tr> <tr> <td>Other</td> <td></td> <td>3.0%</td> <td>4.0%</td> <td>4.5%</td> <td>4.5%</td> </tr> </tbody> </table>				Control Panel		Next 2 Yrs		Next 5 Yrs	Long-Term	Regional Utilization Growth Rate		3.0%	4.0%	4.5%	4.5%	Asia (non-China)		3.0%	4.0%	4.5%	4.5%	China		3.5%	4.5%	5.0%	5.0%	EU 28		3.0%	4.0%	4.5%	4.5%	Other		3.0%	4.0%	4.5%	4.5%																																																																																																																																											
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Source: Webber Research & Advisory, LLC, KBR, Inc.

Webber Research & Advisory: Export Infrastructure | LNG | Marine | ESG

Webber R|A: Vertical LNG – Supply/Demand Model



Source: Webber Research & Advisory, LLC estimates, Bloomberg, Wood Mackenzie

Webber Research & Advisory: Export Infrastructure | LNG | Marine | ESG



Webber R|A: Vertical LNG – New Project Focal Points



- #### How Do We Look At LNG Projects?
- Scalability & Speed-To-Market.** Can you get a reasonable (6-10mtpa) footprint FID'd and on the ground before larger/sponsored projects start slamming the window shut? The longer we look at the project list and our supply/demand model, the more important this seems.
 - Security Of Supply & Location.** While both of these factors impact price, we believe the majority of long-term LNG buyers are less price sensitive than the market thinks. For buyers replacing/suppling baseload energy demand – security of supply is worth quite a bit – hence a general preference for Cheniere, Qatar, etc.. History, credit quality, geographical diversity – it all matters.
 - Price/Cost.** The further down the project list you go, we'd expect a higher proportion of more price sensitive buyers (trading houses, etc..), particularly for lower cost US Gulf LNG. That said, true economic comparisons across the entire project curve remain difficult and open ended, and we think there's still a relatively wide band of costs/LNG price points that keep projects in play.
 - Regulatory Process.** Most 2nd Wave projects are still involved in some aspect of permitting. FERC approval/timing has taken a back seat to pricing dynamics in the market narrative over the past 12 months (due in part to the faster pace of approvals compared to FIDs). It certainly still matters, but worth noting that Lake Charles, Magnolia, Delfin, etc.. are fully approved and still not done.
 - Strategic Value.** The closer we look at the project list, the more we think about consolidation. Most independent projects tend to run tight on liquidity runway (9-18 months) which potentially creates a helpful dynamic for someone looking to roll up the space.

Webber Research & Advisory: Export Infrastructure | LNG | Marine | ESG



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Webber Research: LNG Weekly & LNG Project Deep Dives



Export Infrastructure Webber LNG Weekly

Shell Considering Sale Of Its Queensland LNG Stake: Reuters reported that Shell may sell its 26.25% stake in Queensland Curtis LNG (QCLNG) due to be completed in 2022. Shell is the holding minority in the project, which includes storage tanks, wharves, and terminals. Shell in 2016 and has disclosed it was the largest shareholder in the project.

Glenfarne Buys 50% Stake: This will be the largest stake in the project. The project is owned by Glenfarne Energy, which is a subsidiary of the Russian company Novatek. Novatek announced the acquisition in February 2022. The project includes storage tanks, wharves, and terminals. Shell in 2016 and has disclosed it was the largest shareholder in the project.

Russia Expands DSME announced transshipment facilities: includes Murmansk and Kaliningrad and will play a role in the export of LNG. The project is owned by Glenfarne Energy, which is a subsidiary of the Russian company Novatek. Novatek announced the acquisition in February 2022. The project includes storage tanks, wharves, and terminals. Shell in 2016 and has disclosed it was the largest shareholder in the project.

Small Scale LNG carrier with an IMO 2020 compliant engine: Its smaller size allows for more frequent deliveries to smaller markets. The project is owned by Glenfarne Energy, which is a subsidiary of the Russian company Novatek. Novatek announced the acquisition in February 2022. The project includes storage tanks, wharves, and terminals. Shell in 2016 and has disclosed it was the largest shareholder in the project.

The PTC27X pile cap: 2019 and approved timeline. The project is owned by Glenfarne Energy, which is a subsidiary of the Russian company Novatek. Novatek announced the acquisition in February 2022. The project includes storage tanks, wharves, and terminals. Shell in 2016 and has disclosed it was the largest shareholder in the project.

Sinopec To Build the government of construction will be in LNG terminal in government back. The project is owned by Glenfarne Energy, which is a subsidiary of the Russian company Novatek. Novatek announced the acquisition in February 2022. The project includes storage tanks, wharves, and terminals. Shell in 2016 and has disclosed it was the largest shareholder in the project.

Was Module Eng 2020 CPLNG required construction. We are subject to FERCA 1) Structural 2) Passive fire protection. The project is owned by Glenfarne Energy, which is a subsidiary of the Russian company Novatek. Novatek announced the acquisition in February 2022. The project includes storage tanks, wharves, and terminals. Shell in 2016 and has disclosed it was the largest shareholder in the project.

The timing of the 1) PTC27X engineering 2) Ideally, construction. The project is owned by Glenfarne Energy, which is a subsidiary of the Russian company Novatek. Novatek announced the acquisition in February 2022. The project includes storage tanks, wharves, and terminals. Shell in 2016 and has disclosed it was the largest shareholder in the project.

LNG Pricing Rem (\$2.29/MMBtu) re flagged -27 ladder destination, signa and market sentin The project is owned by Glenfarne Energy, which is a subsidiary of the Russian company Novatek. Novatek announced the acquisition in February 2022. The project includes storage tanks, wharves, and terminals. Shell in 2016 and has disclosed it was the largest shareholder in the project.

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Export Infrastructure Venture Global - Calcasieu Pass LNG Keeping An Eye On Pile Design Changes

Key Takeaways:

- An engine piling area
- Meaningful undermud delays.
- No Reliance on the actual construction evident.

Keeping An Eye on Pile Design Changes: The project is owned by Glenfarne Energy, which is a subsidiary of the Russian company Novatek. Novatek announced the acquisition in February 2022. The project includes storage tanks, wharves, and terminals. Shell in 2016 and has disclosed it was the largest shareholder in the project.

ENR Energy Bull Market: ENR said the remainder of the year will remain more Chinese non-state owned pipeline or term contracts, at (3.0 mtpa) regasification capacity.

India Sets Up Its operations on 6/1 and encourage in increase the share -6.2%, and -2 supply/demand, 1 prices, Gas hubs 1350+ registered consumers. As of 6/1 market-discovered gas (\$2.39/MMBtu) ramp in import ca

LNG Pricing Rem (\$2.29/MMBtu) re flagged -27 ladder destination, signa and market sentin

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Export Infrastructure LNG Canada Update: Troubles Ahead For Shell's LNG Flagship?

An Empty Module Yard & Mounting Schedule Delays

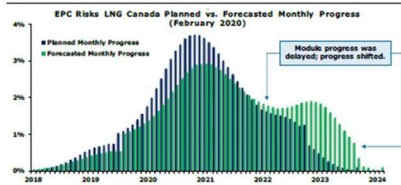
Key Takeaways:

- Still Moving At A Crawl.** As of May, module fabrication was ~2% complete, well behind our ~11% estimate in WIEPC's February 2020 (pre-COVID-19) schedule.
- Satellite-Image Reviews** The COOEC-Fluor Heavy Industries (CFHI) module yard pre-assembly areas look virtually empty, where JGC & Fluor (JFJV) plan to fabricate ~150 modules for LNG Canada.
- Playing Catch Up Won't Be Cheap.** The schedule slip should put even more pressure on the backend of LNG Canada's timeline. The most likely response - a surge in construction activity to make up for lost ground - will be difficult to execute, and expensive. More craft workers + Labor overtime = Budget overruns.

In May 2020, COOEC's module fabrication was ~2% complete...well behind our ~11% estimate in our February 2020 (pre-COVID-19) schedule. In August 2019, CFHI announced they started module fabrication. For clarification, we believe CFHI started steel fabrication for the modules and not module assembly. Typically, it takes ~12 to ~16-weeks to fabricate steel and pipe spools to begin module assembly. If steel fabrication started in August 2019, module assembly should have started in Dec/Jan 2020 (Pre-COVID-19). If steel fabrication started in August 2019, steel structures should be in the module yard pre-assembly laydown areas.

Assessing The Schedule Damage. We've laid out a comparison between our estimated project schedules between February & May. We note our February schedule already included a ~4-month delay due to engineering & module fabrication lag.

Figure 1. WIEPC Risks February 2020 LNG Canada Schedule



Source: Regulatory and company filings, WIEPC Analysis

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Webber Research: Renewable Energy Coverage & Renewable Energy Weekly



ENPHASE ENERGY, INC. (ENPH)
ENPH: Softer Q2 Guide, But Margins & Outlook Commentary Give Support

ENPH: Solid Q1, EPS of \$0.38, she made for a \$11 (~\$0.12/share co harbor revenues). Upside stemmed above our estimat

COVID Update: pandemic signific 50% in April desj noted minimal iss produced 700k IQ production. With (below), but the attach rates in introduction in H2

Price Target: \$4.
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Price Target: \$1 EV/EBITDA multi
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TPI COMPOSITES, INC. (TPIC)
TPIC: Line Transitions, EV Potential Helps Offset COVID Haze

TPIC: Q1 Better EBITDA of \$1.3M Adjustments wer restructuring chi significant volum above Street eq below). Despite remains robust - transitions into Additionally, last modify the regul investment tax cr and Natural Reso light on details t remain believers toward the model guidance and the our 2020 EBITDA \$145MM).

COVID Update: adversely affecte (~\$11MM) - prir be further impact and Mexico (Figu full production, b orders that don't facility operated : (likely until Mexi Juarez, however

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Renewable Energy
Webber Research: Renewables Weekly

Highlights:

- Wild Wee
- PLUG Ac
- BLDP Fo
- JinkoSol
- RUN To 1
- FCEL Res
- NOVA CI
- NEL +\$3
- GE Nearl
- SGRE SG
- MHI Ves
- Vestas F
- Denmark
- Germany
- New Jers
- EPA Race
- Australai
- US Net E
- Solar PV
- LCOE Ber
- Global W
- Solar PV
- US Wind

Wild Week For E alleging various : recovering most c week). From our t veracity of the mo program and (ger aside the optics ar underlying data or we expect to get s the litigation proce the report to supp the ultimate conc (and the rest of t continue to like meaningful growt commercial solar : the dominant fact stock is still tradin (and at least some

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Export Infrastructure
Renewable Energy: The Next Generation
 Initiating Coverage Of ENPH, TPIC, REGI, & ENS

Rolling Out Our First Wave Of Renewable Energy Coverage: We are initiating coverage of REGI (Outperform, PT: \$36), ENPH (Market Perform, PT: \$33), TPIC (Market Perform, PT: \$17), and ENS (Market Perform, PT: \$55). As our historical energy infrastructure coverage has evolved, we've watched renewables consistently gain market share and play an increasingly competitive role in energy trade dynamics - particularly in the emerging markets, where we've seen prices come down, viability rise, and competitive flash points between traditional fuels, LNG, and renewables. Rather than focus solely on incumbent fuels and infrastructure, or solely on a potential bridge like LNG, we think it's more prudent to cover energy transitions from every angle - hence our expansion into renewables.

Why These Names? We're establishing a footprint in several renewable verticals: solar, wind, biofuels, and energy storage, creating a well-rounded platform that we can continue to expand. Within those verticals, ENPH, TPIC, REGI, and ENS were among the stocks most commonly highlighted by our clients as either *underfollowed*, *misunderstood*, or *both*. Although oil and gas (which remains the focal point of our legacy coverage) still dominate global energy markets, it's increasingly clear the future of energy is here - and it's decarbonizing, innovating, and quickly becoming price-competitive. We also think the group dovetails nicely with our skillsets: analyzing SMID energy and infrastructure names with asymmetric risk/return profiles.

How Are We Tackling Renewables? There's a reason why we were both *drawn to* and *pushed toward* this space - each company has a strong core business, at least one (or several) growth drivers, and the kind of significant shifting dynamics that can create particularly compelling risk/reward profiles.

COVID-19 Disclaimer: We continue to highlight our gratitude for health care providers and first responders during this time, and while our primary focus continues to be with the safety and well-being of our families, associates, and employees, the pandemic has certainly complicated our plans for initiation, however we think it's important to have coverage through this period of uncertainty - rather than simply waiting for smoother seas. Each of our names have been and will continue to be greatly affected by the outbreak and associated economic downturn. Countries around the world have delayed energy auctions while agencies and data service providers have all begun to cut global supply and demand forecasts across all energy verticals. That said, it's still too early to truly assess the potential impact on our industry- and company-level coverage. As a result, we are generally exercising caution with our ratings, price targets, and estimates until we get a better view of the ongoing disruption.

Please see important disclosures at the end of this report.

MAY 6, 2020

Stock Rating	Market Perform
Price Target	\$43.00
Current Price	\$53.75
Upside/Downside	-19%
52 Week Range	\$12.99-\$59.15

MAY 8, 2020

Stock Rating	Market Perform
Price Target	\$22.00
Current Price	\$18.82
Upside/Downside	17%
52 Week Range	\$9.19-\$31.18

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Comprehensive Energy & Utility Infrastructure Coverage

Renewable Energy:

Solar, Wind, Biofuels, & Energy Storage

- **Enphase (ENPH)**
- **TPI Composites (TPIC)**
- **Renewable Energy (REGI)**
- **EnerSys (ENS)**
- **Sunrun (RUN)**
- **SolarEdge (SEDG)**
- **Plug Power (PLUG)**
- **SunPower (SPWR)**
- **Ameresco (AMRC)**
- **First Solar (FSLR)**

LNG Infrastructure:

LNG Exporters, Carriers, Floating Regas & Power

- **Cheniere (LNG/CQP)**
- **Golar (GLNG/GMLP)**
- **GasLog (GLOG/GLOP)**
- **Teekay LNG (TGP)**
- **NextDecade (NEXT)**
- **Tellurian (TELL)**
- **Venture Global (Private)**
- **New Fortress (NFE)**
- **Hoegh (HLNG/HMLP)**
- **Dynagas (DLNG)**
- **Flex (FLEX)**

Marine:

Tankers, LPG, Barges, Box Leasing, NGL Exports

- **Kirby (KEX)**
- **Euronav (EURN)**
- **Frontline (FRO)**
- **DHT (DHT)**
- **Ardmore (ASC)**
- **Dorian (LPG)**
- **Navigator (NVGS)**
- **CAI (CAI)**
- **Triton (TRTN)**
- **Scorpio Tankers (STNG)**
- **Textainer (TGH)**

Utilities & Energy:

W|EPC Project Coverage

Utilities

- **SO, SRE, D, AEP, CNP**

Midstream

- **ENB, EPD, KMI, ET**

IOCs

- **XOM, RDS, TOT**

LNG Projects

- **LNG Canada**
- **Calcasieu Pass**
- **Plaquemines**
- **Driftwood**
- **Rio Grande**
- **Cameron**
- **Commonwealth**
- **Golden Pass**
- **Annova LNG**
- **Costa Azul**
- **Tortue FLNG**
- *And Many More*

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Cheniere (LNG) Sum Of The Parts Analysis

	Liquefaction Volumes												Cheniere Marketing ¹			
	Corpus Christi Contracts									CC-Stage 3			Utilization	85%	100%	
	Train 1			Train 2			Train 3			Stage 3	CMI					
Counterparty	Endesa S.A.	Pertamina	Iberdola	Pertamina	Iberdola	Gas Natural Fenosa	Woodside Energy	Electricite de France	EDP SA	Trafigura	CNPC	TBD/Mix	Utilization: 85%	Utilization	85%	100%
Contracted Annual Capacity (MMBtu)	120.1	48.0	48.0	33.1	40.6	80.1	45.4	41.1	41.1	53.4	64.1	405.7	101.4	Available Annual Capacity	161.7	325.6
% Of Total Capacity	46%	19%	19%	13%	16%	31%	18%	16%	16%	21%	25%	80%	20%	% Of Total Capacity	21%	21%
Fixed Fee (\$/MMBtu)	\$3.50	\$3.50	\$3.50	\$3.50	\$3.50	\$3.50	\$3.50	\$3.50	\$3.50	\$2.75	\$2.75	\$2.45	\$1.38	Net Revenue (\$/MMBtu)	\$1.38	-\$0.33
Annual Cash Flows	\$420.4	\$168.0	\$168.0	\$115.9	\$142.1	\$280.4	\$158.9	\$143.9	\$143.9	\$146.8	\$176.2	\$993.9	\$118.54	Annual Cash Flows	\$189.03	-\$105.83
Maintenance & Opex ²	(37.5)	(15.0)	(15.0)	(10.3)	(12.7)	(25.0)	(14.2)	(12.8)	(12.8)	(16.7)	(20.0)	(102.4)	(25.6)	Allocated Maintenance & Opex ²	(40.0)	(80.5)
Pipeline Expense ²	(27.8)	(11.1)	(11.1)	(6.9)	(8.4)	(16.7)	(9.4)	(8.6)	(13.0)	(16.8)	(20.2)	(40.0)	(10.0)	Allocated Pipeline Expense ²		
Maintenance Capex ²	(18.3)	(7.3)	(7.3)	(4.5)	(5.6)	(11.0)	(6.2)	(5.6)	(8.6)	(11.1)	(13.3)	(52.8)	(13.2)	Allocated Maintenance Capex ²		
EBITDA (\$MM)	\$336.7	\$134.6	\$134.6	\$94.1	\$115.4	\$227.7	\$129.0	\$116.8	\$109.5	\$102.2	\$122.6	\$798.7	\$69.7	EBITDA (\$MM)	\$149.1	-\$186.3
EBITDA Multiple ³	10.0x											8.0x		EBITDA Multiple ³	5.0x	
Enterprise Value (\$MM)	\$3,367.2	\$1,345.8	\$1,345.8	\$940.8	\$1,154.0	\$2,276.7	\$1,290.4	\$1,168.2	\$1,095.1	\$1,021.8	\$1,226.2	\$6,389.9	\$557.9	Enterprise Value (\$MM)	\$745.3	\$0.0
Less: Est Allocated Net Debt ²	(1,754.2)	(701.1)	(701.1)	(490.1)	(601.2)	(1,186.1)	(672.3)	(608.6)	(777.8)	(1,010.1)	(1,212.1)	(3,466)		Less: 2024E Net Debt (\$MM) ²		
Equity Value (\$MM)	\$1,613.0	\$644.7	\$644.7	\$450.7	\$552.8	\$1,090.6	\$618.2	\$559.6	\$317.3	\$11.7	\$14.1	\$2,924.4	\$557.9	Equity Value (\$MM)	\$745.3	\$0.0
/ LNG Shares Outstanding (MM)	299.8									299.8		299.8		/ LNG Shares Outstanding (MM)		
Equity Value/Share	\$5.38	\$2.15	\$2.15	\$1.50	\$1.84	\$3.64	\$2.06	\$1.87		\$1.14		\$9.75	\$1.86	Equity Value/Share	\$2.49	\$0.00
Weighted Average Cost Of Capital ⁴	6.9%									6.9%		6.9%		Weighted Average Cost Of Capital ⁴		
Corpus Christi CF/Share (PV)	\$5.03	\$2.01	\$2.01	\$1.36	\$1.67	\$3.29	\$1.87	\$1.69		\$0.92		\$6.99	\$1.33	CMI CF/Share (PV)	\$2.10	\$0.00
Total CF/Share (PV)	\$21.96															
Current CQP Unit Price (\$/unit)	\$34.18															
x CQP Units Owned (MM) ⁶	249.8															
CQP Equity Stake (\$MM)	\$8,538															
CQP GP IDRs (\$MM, at 12x)	\$299															
Total CQP GP/Equity Ownership Value	\$8,837															
/ LNG Shares Outstanding	299.8															
CQP Equity Stake (\$/share)	\$29.48															
Plus: PV Of Corpus Christi Volumes	\$21.96															
Plus: Probability Weighted CC-Stage 3	\$4.16															
Total Implied Value - LNG/Share	\$56															

(1) Assumes excess uncontracted volumes sold by Cheniere Marketing at a \$5.50/MMBtu less relevant input costs. For SPL's CMI volumes: HHub + premium, Toll, Transport. For CCL's, HHub + Transport. A 80% utilization rate applied evenly.

(2) Assumes proportionate allocation of maintenance, operating, and pipeline expenses based on nominal contracted capacity amounts, and proportionate allocation of net debt based on EBITDA contribution

(3) 11x EBITDA multiple represents discount to recent private market transactions (Cove Point - 12x)

(4) Utilizes current 20-year U.S. Treasury note yield as proxy for risk-free rate, 6% cost of debt, 1.0x debt/equity ratio, 7% expected market return, and 5-year historical beta

(5) Until contract details disclosed at FID, unsold CC3 volumes sold through CMI, using existing CMI utilization, margin estimates

(6) Includes GP units

Source: Webber Research, LLC, FactSet, Company filings

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