

# Crude Market Handicapped by OPEC

Crude tanker demand landscape changing:

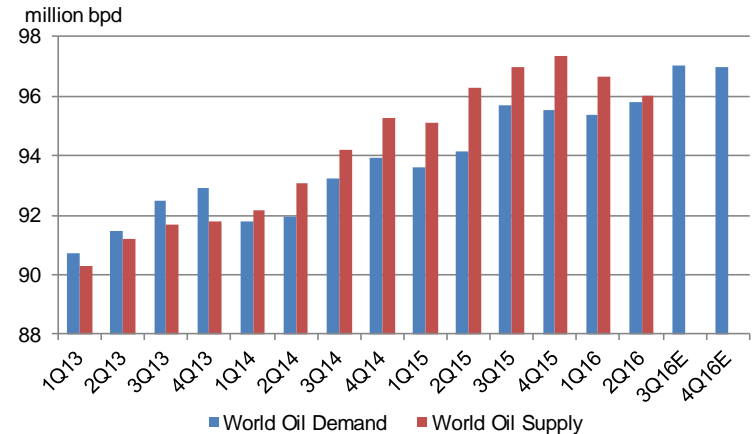
- U.S. production of crude oil reducing the need for imports.
- New refineries close to the source of production such as Saudi Arabia resulting in the cannibalization of crude tanker trade by product tankers.
- Asian-Pacific region is the growth driver.
- U.S. oil export ban has been lifting, leading to growing oil cargoes as majors take advantage of pricing differentials.

Recent OPEC production cut has removed the only significant growth catalysts for crude tanker demand.

Near-term supply concerns becoming an issue with 5%-6% growth in 2017.

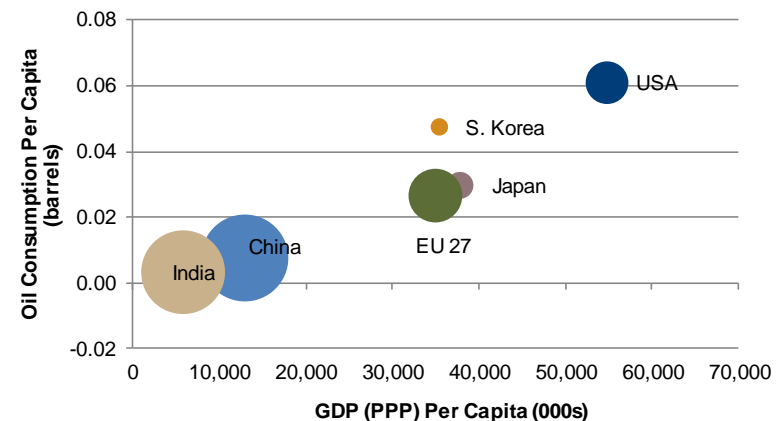
Non-OECD countries, specifically China and India, are expected to drive future demand for crude oil.

**Global Crude Oil Supply/Demand Analysis**



Source: IEA

**Chinese and Indian Per Capital Oil Consumption**



Source: World Fact Book- CIA

**Rate Outlook Through 2019**

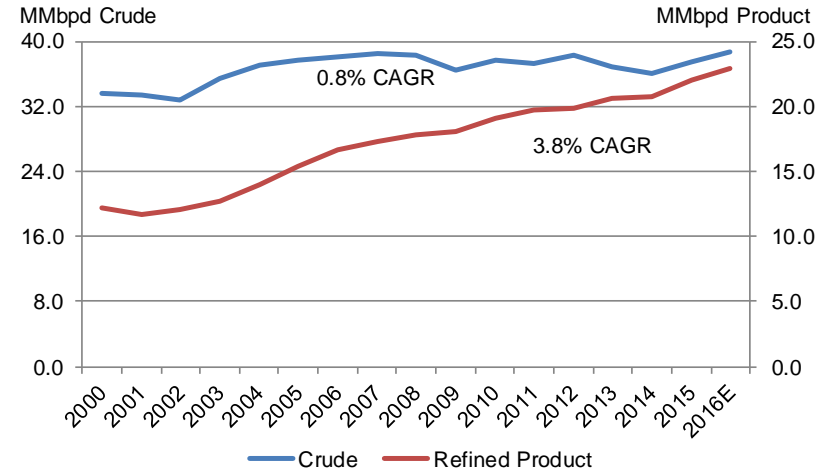
	1Q17E	2Q17E	3Q17E	4Q17E	2017E	2018E	2019E
VLCC	36,000	32,000	32,000	40,000	35,000	35,000	35,000
Suezmax	31,000	27,000	27,000	35,000	30,000	30,000	30,000
Aframax	26,000	22,000	22,000	30,000	25,000	25,000	25,000

Source: Stifel estimates

## Crude Tanker Demand Growth Capped

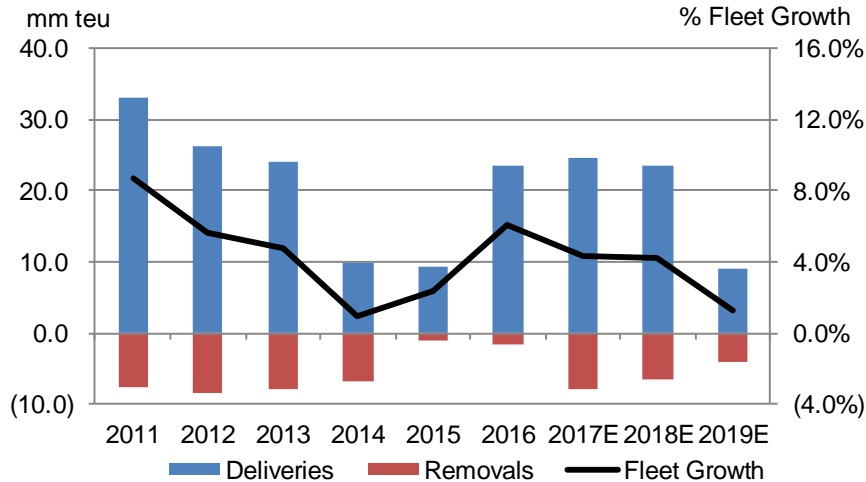
- Global production has outstripped consumption by estimated 1.8 million bpd, driving inventory levels to over 66 days of industrial coverage, highest in over 20 years.
- Several OPEC members have already reduced output, including Saudi Arabia and Iraq, while Iran, Libya, and Nigeria receiving exceptions. Russia and other producers have also started reducing output.
- U.S. shale producers have begun bringing rigs back online keeping production near historically high levels while reducing their breakeven costs by over 50%.

**Product Tanker Demand vs. Crude Tanker Demand**



Source: Clarkson Research Services and FactSet

**Crude Tanker Fleet Growth**



Source: Clarkson Research Services

**Analysis of Global Crude Oil Market**

(mm bpd)	2013	2014	2015	2016E	2017E
<b>Global Oil Production</b>	<b>91.5</b>	<b>93.7</b>	<b>96.4</b>	<b>95.4</b>	<b>95.6</b>
OPEC	36.8	36.6	38.7	39.4	39.6
Saudi Arabia	9.4	9.5	10.1	10.3	10.3
Iraq	3.0	3.3	4.0	4.4	4.5
Iran	3.0	2.8	2.9	3.7	3.9
Other	21.5	21.0	21.8	21.1	21.0
Non-OPEC	54.6	57.0	57.7	55.9	56.0
<b>Global Oil Consumption</b>	<b>91.9</b>	<b>92.8</b>	<b>94.8</b>	<b>96.1</b>	<b>97.3</b>
North America	23.4	23.5	23.7	24.0	24.0
Europe	13.6	13.4	13.7	13.8	13.8
China	10.3	10.8	11.4	11.6	11.9
Other	44.7	45.1	46.0	46.7	47.7
<b>Inventory Build/(Draw down)</b>	<b>(0.4)</b>	<b>0.9</b>	<b>1.5</b>	<b>(0.8)</b>	<b>(1.7)</b>

Source: IEA and Stifel estimates

# Product Tankers In Structural Growth

Product tanker demand growth strengthening:

- New refineries close to the source coming online or ramping up capacity in the Pacific market.
- Refined product exports remain steady from the U.S. Gulf Coast.
- Struggling refineries in Europe and Japan either lowering utilization or closing operations.
- Arbitrage trade window presents several opportunities
- Low oil prices drive consumption

New vessel deliveries of 3-4% per year easily manageable.

Rates and asset values should firm up through 2018.

**Surging U.S. Refined Product Exports**



## New Export Oriented Refineries

Start Year	Refinery	Owner	Location	Peak Capacity (000b/d)
2017	Ras Laffan 2	Qatargas	Qatar	136
2017	Persian Gulf Star 1	Tamin Petro and Petrochem	Iran	120
2017	Sohar	Oman Oil Refineries	Oman	112
2017	Jebel Ali	Enoc	UAE	20
2017	Rabigh 2	Petro Rabigh	Saudi Arabia	50
2018	Qaiwan-Baizan	Qaiwan Group	Iraq	50
2019	Jazan	Saudi Aramco	Saudi Arabia	400
2019	Mina Abdulla	Kuwait National Petro. Co.	Kuwait	184
2019	Siraf	Siraf Refineries Infrastructure	Iran	120
2019	Persian Gulf Star 2	Tamin Petro and Petrochem	Iran	120
2019	Al-Zour	Kuwait National Petroleum Co	Kuwait	615

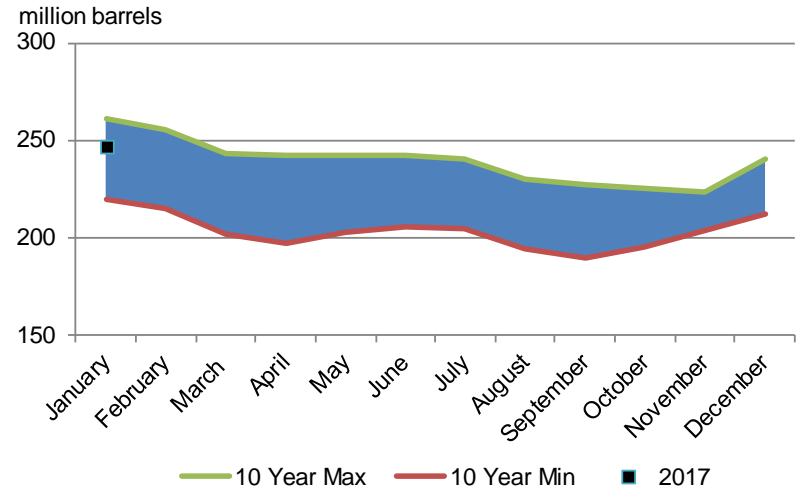
## Announced Consuming Region Refinery Closures

Removal	Refinery	Owner	Location	Peak Capacity (000b/d)
2014	MOL Mantova	MOL Hungary	Italy	52
2014	Tokuyama	Idemitsu Kosan	Japan	121
2014	Myroran	JX Nippon Oil & Energy	Japan	180
2014	Kurnell	Caltex Australia	Australia	125
2015	Bulwer Island	BP	Australia	102
2015	North Killingholme	Total	United Kingdom	110
2015	Brisbane	Puma Energy	Australia	140
2015	Gela	Eni	Italy	105
2015	Collombey	Tamoil	Switzerland	55
2015	Nishihara	Petrobras	Japan	100
2015	Donges	Total	France	219
2016	La Mede	Total	France	159
2016	Lindsey	Puma Energy	United Kingdom	207

# Short-Term Drivers of Product Tanker Demand **STIFEL**

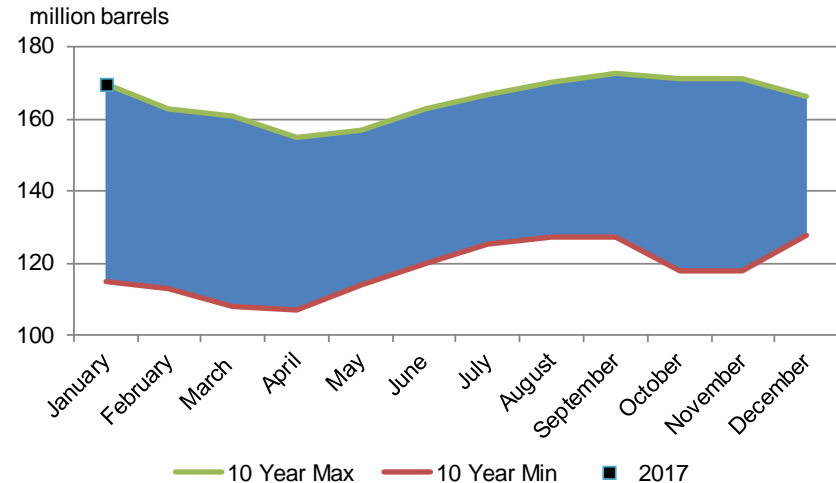
- After rising due to seasonal demand, product tanker rates down average 36%,
- Several major Middle Eastern refineries have restarted operations, adding over 1 million bpd of refining capacity to the market.
- Latin American refineries are currently operating below 50% utilization, requiring higher imports from the U.S. refineries and leading to higher PADD 3 utilization%.
- Most of the significant Middle East refinery capacity has entered the market, but still over 1.9 million bpd scheduled to come online by 2019.
- Currently TC2 (UK Cont to US Atlantic Coast) gasoline arbitrage window is open and trading in the Mediterranean is robust.
- Approximately 5-7 LR2 vessels (3% of LR2 trading fleet) are being used as floating storage.

**U.S. Gasoline Inventory Levels**



Source: EIA

**U.S. Distillate Inventory Levels**

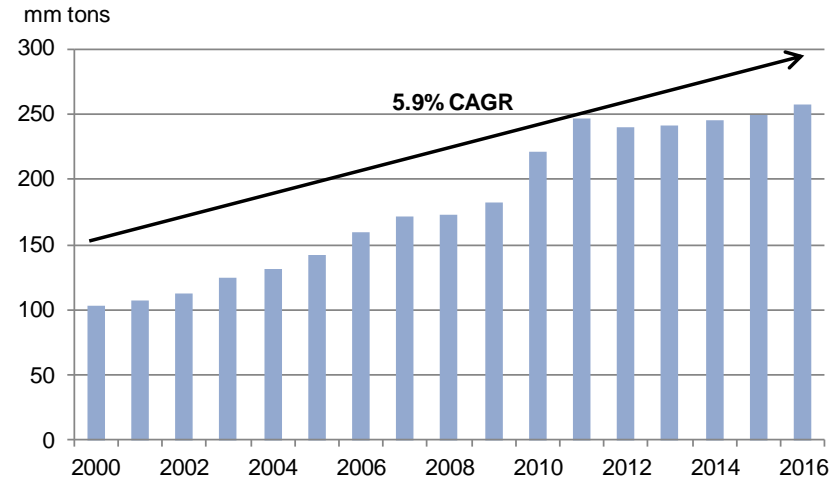


Source: EIA

## LNG Market Prized Jewel in Shipping

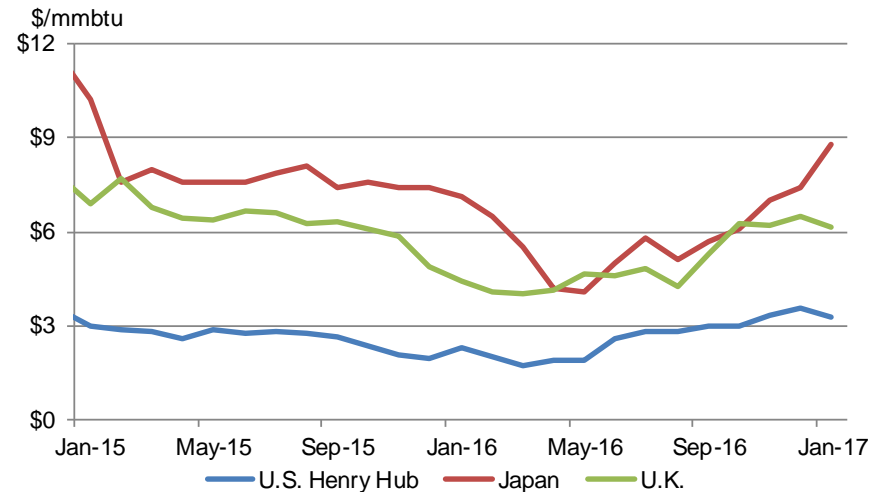
- LNG trade is currently bottlenecked by lack of liquefaction plants with minimal impact from low oil prices.
- LNG transportation market currently oversupplied, but 2016 vessel orders reached a six year low of only 10 vessels with banks reluctant to provide lending without contracts.
- Floating Regasification (FSRU) offer increased flexibility and lower cost solution of importers relative to land based infrastructure with 28 facilities in operation with 33 potential projects under development.
- Although LNG-to-FSRU conversions have been slow, several companies have firmly committed to conversion through ordering long lead-time items. We believe 3-5 conversions per year are likely.
- Floating Liquefaction (FLNG) units requires less infrastructure and less capacity. Can be used for smaller fields while being relocated in the event of severe weather or geopolitical risk.
- Asian and European LNG prices remain lower than historical levels, but have rebounded due to colder weather with pricing differentials remaining between U.S. Gulf exporters and both markets.

**LNG Seaborne Trade Growth 2000-2016**



Source: Clarkson Research Services

**Regional Natural Gas Pricing Differentials**

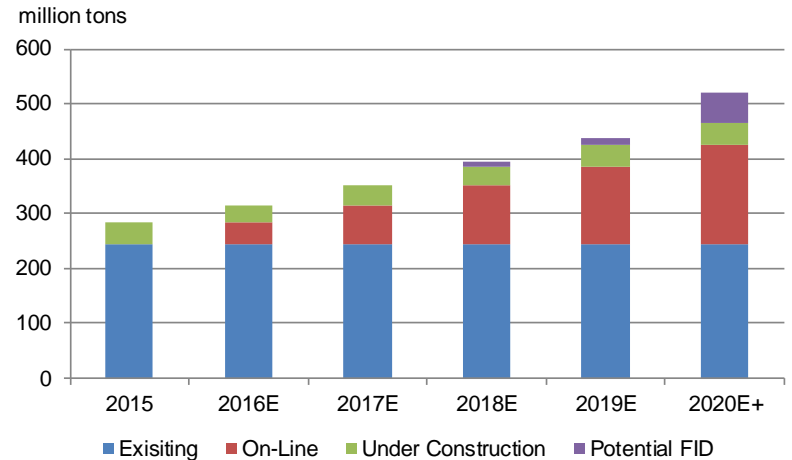


Source: BP Statistical Review of World Energy 2015 & Bloomberg

## LNG Volumes Slowly Building Up

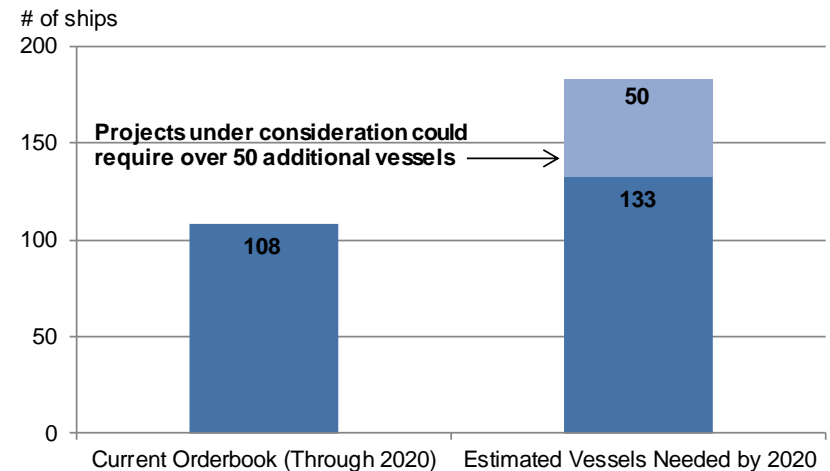
- Current cold weather has driven up LNG demand with Asian and European pricing over \$9.00/mmbtu.
- Charter rates surged over \$50,000 due to higher heating demand which we expect to continue throughout the winter months.
- Recent OPEC reduction announcement should help decouple LNG and oil prices longer-term. Additionally higher oil prices should make LNG alternatives, such as naphtha, subsequently increase
- Higher oil prices should lead to a greater push for LNG export infrastructure.
- Over past three months, there were three new FSRU contracts awarded (Ghana, Brazil, and Turkey) with several more likely to be finalized in early 2017.
- FSRUs are substantially cheaper than land-based terminals and the number of importing LNG countries forecast to increase from 29 in 2014 to 48 in 2025 with around 80% of new importing markets have used FSRU since 2007.
- Projects with designed existing port and pipeline infrastructure or have signed sales agreements are more likely to move forward, providing the market with a potential second wave of new liquefaction capacity going past 2020.

### Cumulative Impact of LNG Growth



Source: Company filings and Stifel estimates

### Global LNG Demand Target Potential

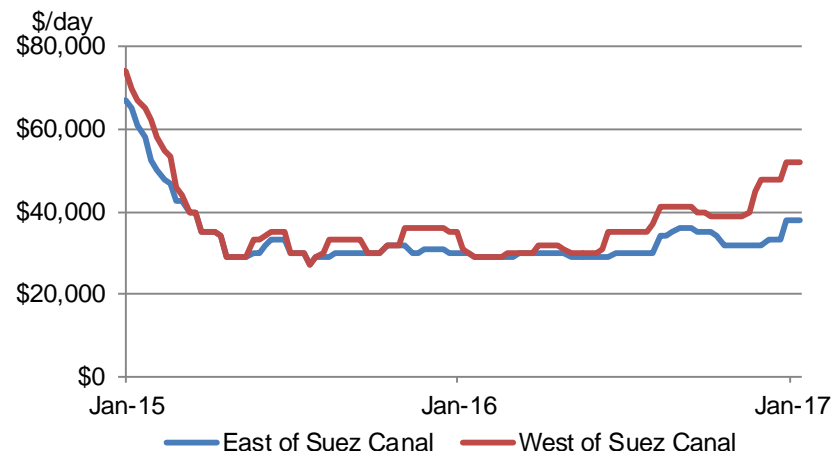


Source: Company filings and Stifel estimates

# LNG Supply & Demand / Outlook

- We expect the market to need 133 new LNG carriers though 2020 with just 108 vessels on order through 2020.
- The pace of new project start ups does not begin in earnest until 2018-19 when U.S. terminals come online.
- Current oversupplied market may change the trading patterns to more local or regional based.
- We expect the further tightening in 2017 to lead to a mostly balanced market, which should allow charter rates to slowly improve.

### LNG Carrier Spot Rates



Source: Astrup Fearnley

### LNG Shipping Supply and Demand

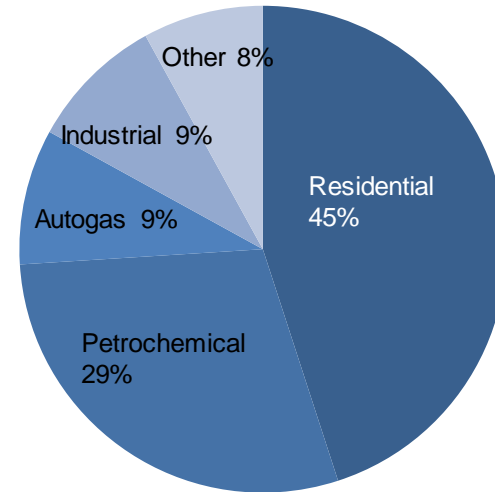
Demand (MM)	2011	2012	2013	2014	2015	2016E	2017E	2018E	2019E	2020E
Liquefaction Volumes Growth (cubic meters)	538.3	529.6	532.4	545	565.0	584.9	648.3	740.0	818.4	913.4
New Capacity (cm)	55	(9)	3	13	20	63	92	78	95	24
Additional Incremental Vessels Needed	37	(6)	2	9	14	27	36	37	51	9
Beginning Vehicles (greater than 100,000 cbm)	313	320	318	328	352	370	395	426	461	483
Deliveries	11	2	16	32	29	34	37	39	25	3
Removals/Conversions	(4)	(4)	(3)	(2)	(4)	(5)	(4)	(4)	(3)	(3)
Vessel >25 Cold Stacked	0	0	(3)	(6)	(7)	(4)	(2)	0	0	0
Ending Vehicles	320	318	328	352	370	395	426	461	483	483
Incremental Demand	37	(6)	2	9	14	27	36	37	51	9
Incremental Supply	7	(2)	10	24	18	25	31	35	22	0

Source: Clarkson Research Services, company filings, Stifel estimates

# LPG Market Continues to Develop

- Seaborne LPG trade is primarily driven by the production of LPG as a byproduct and as global oil and gas production increases, trade typically increases as well.
- The primary uses of LPG are residential consumption as a fuel source and as a feedstock used in the production of ethylene, propylene, and butadiene.
- Ethane export market continues to develop slowly, which shows the potential to revolutionize LPG shipping.

**Primary Uses of LPG**



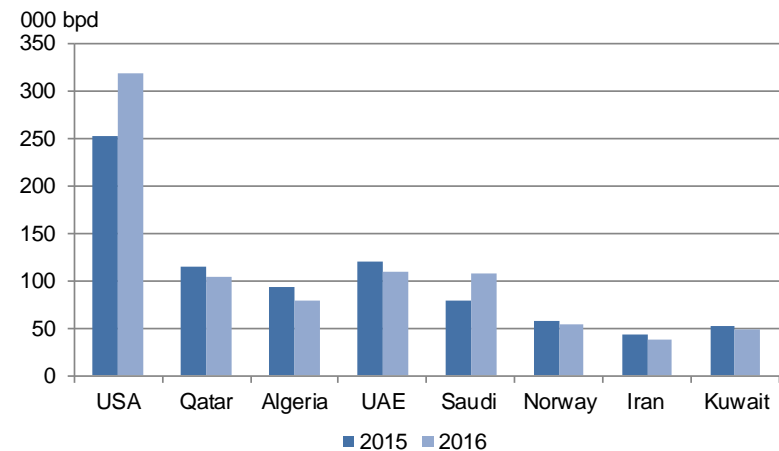
Source: Drewry

**U.S. Exports of Propane and VLGC Spot Rates**



Source: EIA and Fearnleys

**Major Exporters of LPG**



Source: Enterprise Product Partners



# Short-Term Drivers of LPG Carriers Demand

- Lower energy prices have significantly reduced domestic shale oil and gas production in the U.S, limiting supply of natural gas liquids, including predominantly propane, butane, and ethane, and increasing prices.
- Marcus Hook is currently exporting 35,000 bpd but will expand to over 545,000 bpd by end of 2017 while Targa Resources recently completed expansion efforts to bring its export capacity to 300,000 bpd, however its currently only operating at 70% of nameplate capacity.
- There has been substantial growth in the export of petrochemical gases from the U.S. Gulf Coast which we believe will likely be transported in greater volumes and longer distances.
- AltaGas received went FID on Canada's first LPG export capacity with 40,000 bpd of capacity entering the market in 1Q2019.
- LPG shipyard capacity is constrained following several cancellations and yard closures.

## U.S. LPG Export Facilities

### Existing

<u>Owner</u>	<u>Facility</u>	<u>Location</u>	<u>Capacity Mb/d</u>
Enterprise	Enterprise	TX	533
Targa	Galena Park	TX	217
Sunoco Logistics	Marcus Hook	PA	35
Sunoco Logistics	Mariner South	TX	200
Sunoco Logistics	Mariner East 1	PA	35
DCP Midstream	Chesapeake	VA	8
Petrogas	Ferndale	WA	30
Phillips 66	Freeport	TX	150
Total			1,208

### Brownfield

<u>Owner</u>	<u>Facility</u>	<u>Location</u>	<u>Capacity Mb/d</u>	<u>Schedule</u>
Sunoco Logistics	Mariner East 2	PA	275	2017
Sunoco Logistics	Mariner East 3	PA	250	2017

### Greenfield

<u>Owner</u>	<u>Facility</u>	<u>Location</u>	<u>Capacity Mb/d</u>	<u>Schedule</u>
Occidental	Ingleside	TX	100	2017
Enlink Midstream	Enlink	LA	100	2017
Sage Midstream	Haven	WA	47	2017
Pembina	West Coast Terminal	OR	37	2018
AltaGas	British Columbia	Canada	40	2019
Total Additions			849	

Source: Company filings and Stifel estimates