

Developments in LNG as a Bunker Fuel

Desmond Wong

October 2019



S&P Global
Platts

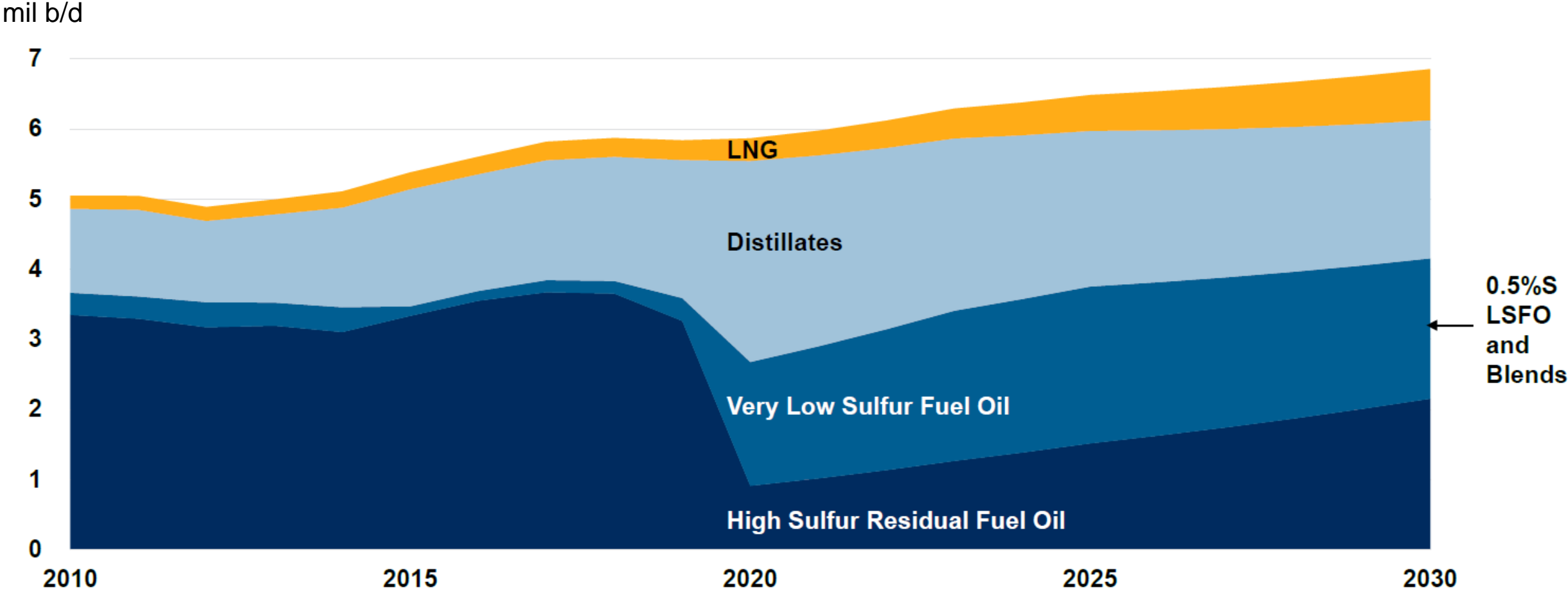


DISCLAIMER

Restrictions on Use: You may use the content of this presentation (whether verbal and/or written) (collectively, “Data”) only for your personal use. You may not publish, reproduce, distribute, retransmit, resell, create any derivative work from and/or otherwise provide access to Data or any portion thereof to any person (either within or outside your company including, but not limited to, via or as part of any internal electronic system or Internet site), firm or entity. Disclaimer: PLATTS, ITS AFFILIATES AND ALL OF THEIR THIRD-PARTY LICENSORS DISCLAIM ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE AS TO THE DATA, OR THE RESULTS TO BE OBTAINED BY ITS USE OR AS TO THE PERFORMANCE THEREOF. Limitation of Liability: In no event whatsoever shall Platts, its affiliates or their third-party licensors be liable for any indirect, special, incidental, punitive or consequential damages, including but not limited to loss of profits, trading losses, or lost time or goodwill, even if they have been advised of the possibility of such damages, whether in contract, tort, strict liability or otherwise. The Data is provided on an “as is” basis and your use of the Data is at your own risk. Copyright © 2019 by Platts, S&P Global Inc. All rights reserved. No portion of this publication may be photocopied, reproduced, retransmitted, put into a computer system or otherwise redistributed without prior authorization from Platts. Platts is a trademark of S&P Global Inc.

LNG as a bunker fuel expected to get a boost from IMO 2020

About 2.8 mil b/d HSFO demand decrease from bunker sector



LNG Bunkering Demand set to grow

LNG bunkering set to accelerate globally in 2019: **SEALNG**
 Singapore (Platts)--18Jan2019/155 am EST/0655 GMT

Repsol, Brittany Ferries partner for LNG bunkering for Spanish operations
 Singapore (Platts)--25Feb2019/308 am EST/0808 GMT

UPDATE: Singapore's Pavilion Energy charters first LNG bunker vessel
 Sydney (Platts)--25Feb2019/417 am EST/0917 GMT

Japex aims to launch LNG bunkering at Tomakomai, Hokkaido in future
 Tokyo (Platts)--26Feb2019/312 am EST/0812 GMT

DNV GL, Singapore's **Keppel** ink agreement to promote LNG bunkering
 Singapore (Platts)--15Apr2019/415 am EST/0815 GMT

FueLNG achieves 100th LNG bunkering operation in Singapore, ahead of IMO 2020
 Singapore (Platts)--16Apr2019/239 am EST/0639 GMT

Pavilion Energy pioneers first ship-to-ship LNG bunkering operation in Singapore
 Singapore (Platts)--2May2019/1210 am EDT/410 GMT

Four Japanese companies conduct first LNG bunkering operation at Kitakyushu
 Singapore (Platts)--16May2019/654 am EST/1054 GMT

Gazpromneft Marine Bunker, Rosmorport ink agreement for Baltic LNG bunkering
 London (Platts)--6Jun2019/138 pm EDT/1738 GMT

ENN Energy Holdings advances LNG bunkering plans in China as IMO 2020 looms
 Singapore (Platts)--11Jun2019/352 am EST/0752 GMT

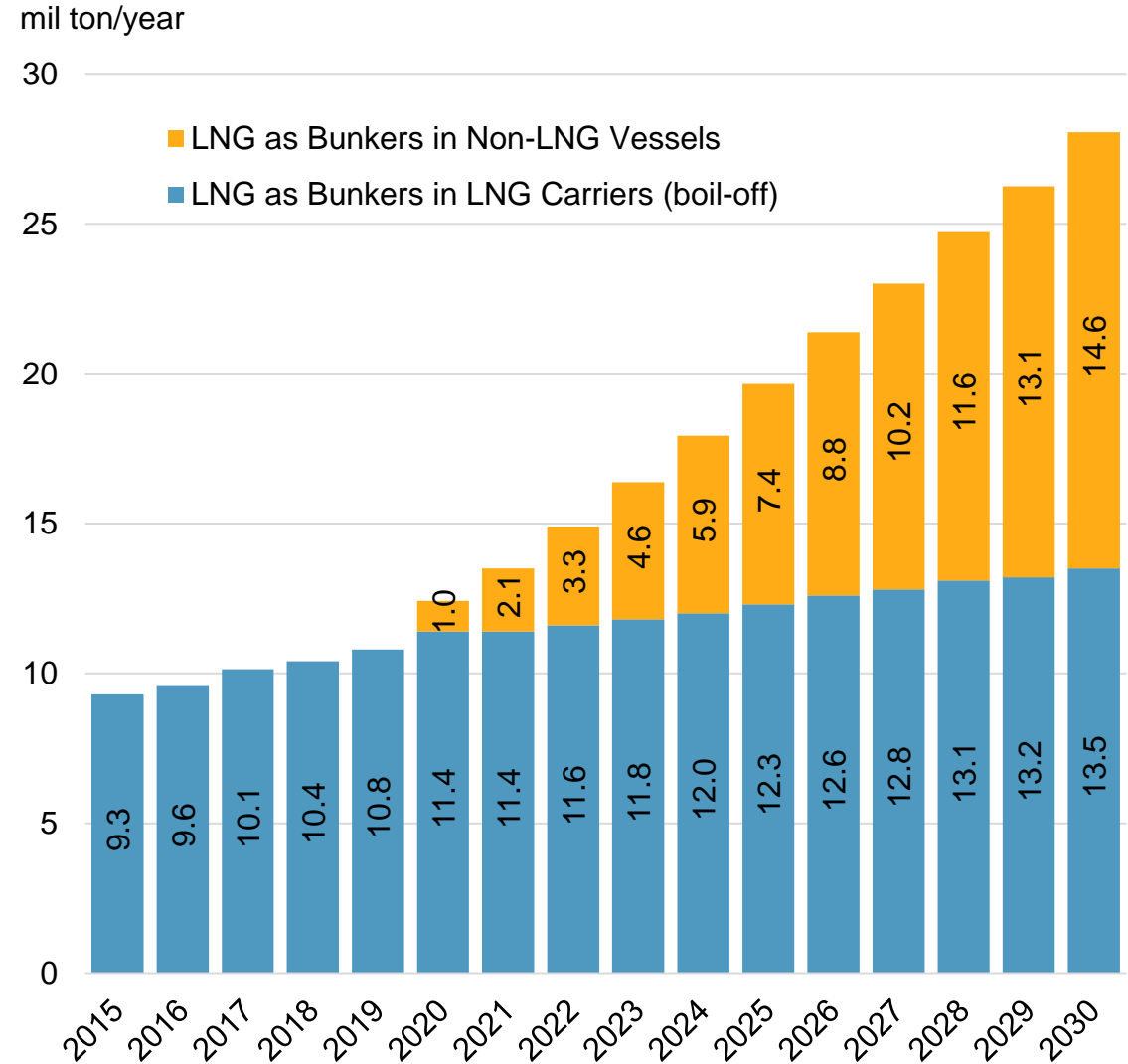
LNG bunkering to gain momentum as IMO 2020 compliance option: **Shell** exec
 Singapore (Platts)--14Jun2019/1020 am EST/1420 GMT

Gasum completes ship-to-ship LNG bunkering operation in Rotterdam
 London (Platts)--27Jun2019/821 am EDT/1221 GMT

LNG bunkering uptake could ease pressure on LSFO as IMO 2020 looms
 Singapore (Platts)--19Jul2019/510 am EST/0910 GMT

Hoglund wins contract for Norway's first LNG bunkering vessel
 London (Platts)--28Aug2019/950 am EDT/1350 GMT

Gibraltar sees largest European LNG bunkering operation to date
 London (Platts)--02Sep2019/203 pm EST/1803 GMT



Source: Platts; Platts Analytics

Platts launched LNG Bunkers Assessments on Sep 2, 2019

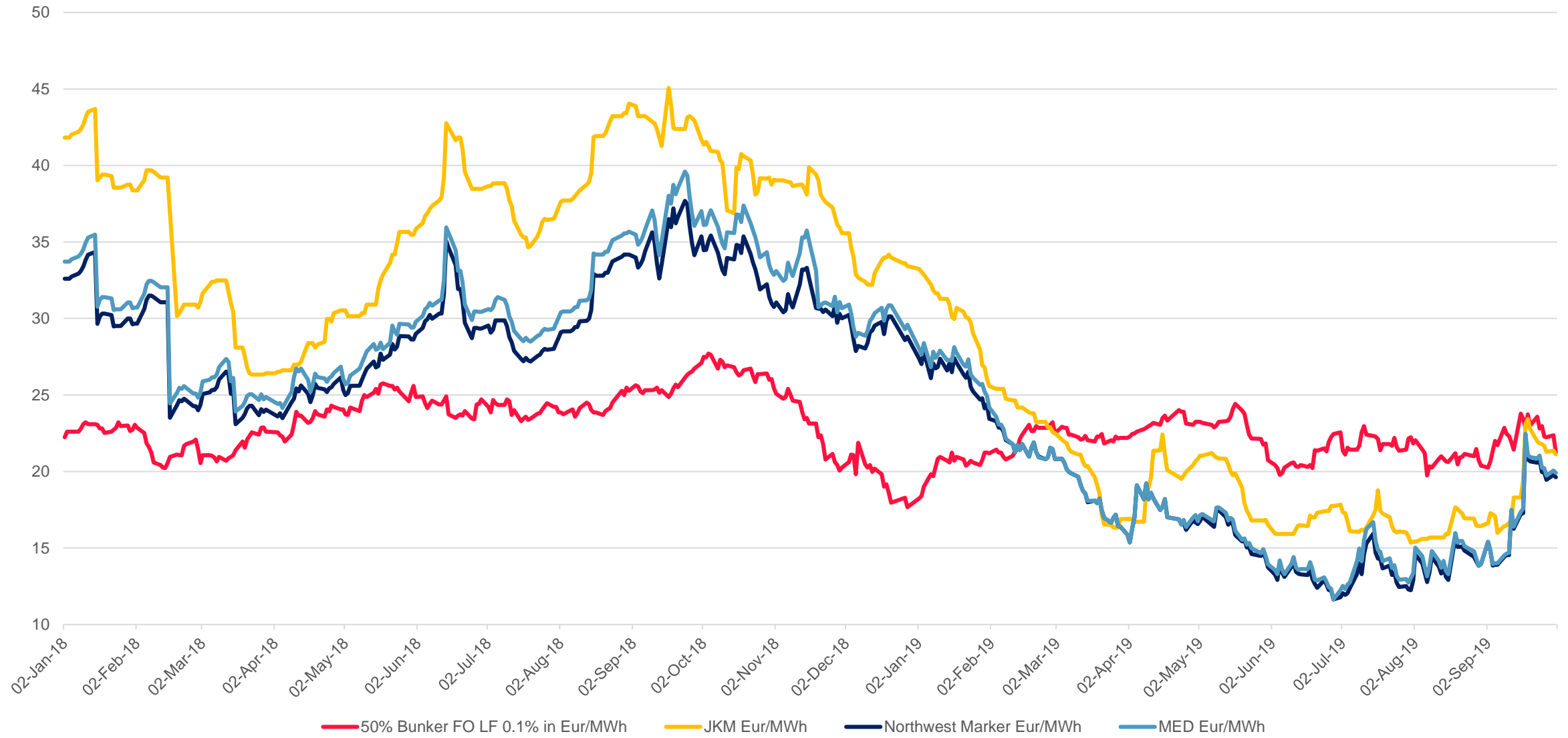
- Increased build-out in infrastructure
- More trading of LNG as a marine fuel

Parameters	Singapore	Rotterdam
Frequency	Daily	Daily
Price Basis	\$/MMBtu (\$/Mt)	Eur/MWh (\$/Mt)
Incoterm	Truck-to-ship (ex-wharf) or Barge-to-ship (delivered)	Truck-to-ship (ex-wharf) or Barge-to-ship (delivered)
Differential to	FOB SG net-back from JKM	DES LNG Northwest Europe
Platts Codes	LNBSG00	LNBR00

Changing landscape of LNG as a bunker fuel in NWE/Mediterranean

	Old	New
Pricing	Discount to low sulphur fuels (\$/MT)	Premium to TTF month-ahead gas (Eur/MWh)
Contract duration	Multi-year agreements for supply	Rolling contracts of around a year
Delivery flexibility	Supply provided by one dedicated seller to one dedicated buyer at preferred location	Availability to at multiple ports in Northwest Europe where LNG bunkering has been approved
Competition	Sellers competed on pricing differential to competing fuel (price)	Sellers compete to reduce fixed costs, and innovative solutions (logistics)
Locations	Large fleet owners seeking regional contracts	Large fleet owners now seeing availability at global ports of call for their vessels

Buyers leaning towards a gas index in NWEurope/Mediterranean



The most expensive factor of fixed costs and how it can change

	<p>Currently, fixed costs for loading, bulk break and terminal usage ranges from between \$1.50/MMBtu to \$2.5/MMBtu</p>	
	<p>Current status</p>	<p>Market development over time</p>
<p>Capital Expenditure</p>	<p>Costs are high due to significant expenditure to amortize infrastructure</p>	<p>Costs likely to come down as capex is recovered over time</p>
<p>Utilization Rate</p>	<p>Current utilization rate of assets sits at around the 10% mark, limiting revenue generation, increasing costs</p>	<p>As shipping industry switches fuels and more LNG bunker is sought, utilization rates grow, chipping away at costs of logistics</p>

Questions and Answers