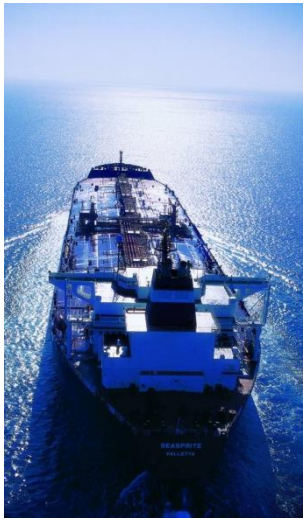
PADD1 Clean Tanker Demand Outlook

02 November 2017



Topics for discussion

- Executive Summary
- PADD1 Macro environment
- Gasoline demand & balances
- Heating oil demand
- Sulphur specs & gasoil demand
- Middle-distillate balances
- Overall clean tonne-mile demand
- PADD1 Lower Atlantic Supply
- Conclusions
- Methodology

Executive Summary

PADD1 clean tanker demand poised to resume its rapid decline

PADD1 macro fundamentals do not support TC2 demand

- On surface, PADD1 demographics appear in line with US averages…
- …but a tale of two halves, as Northeast fundamentals remain weak, with Florida and the Lower Atlantic as only major source of PADD1 growth

Demographics, oil prices & EVs to hit gasoline demand

- Weak demographics to restrain PADD1 auto fleet growth
- Vehicle miles travelled remain muted after recent price-inspired surge
- Electric Vehicles boosting apparent fuel economy, cutting into demand

Change in heating oil specs savaged PADD1 refining

- Reduction in heating oil sulphur specs to ULSD levels was the key driver behind PADD1 refinery capacity rationalisation
- Removed PADD1 capacity without sufficient hydrotreating capacity

Continued decline in heating oil use pressuring demand

- Fuel switching to natural gas for home heating cutting into gasoil demand
- Structural decline in heating oil offsetting rising trucking demand
- Reduced gasoil demand more pronounced in Northeast destinations

Lower PADD1 clean imports and tonne-mile demand

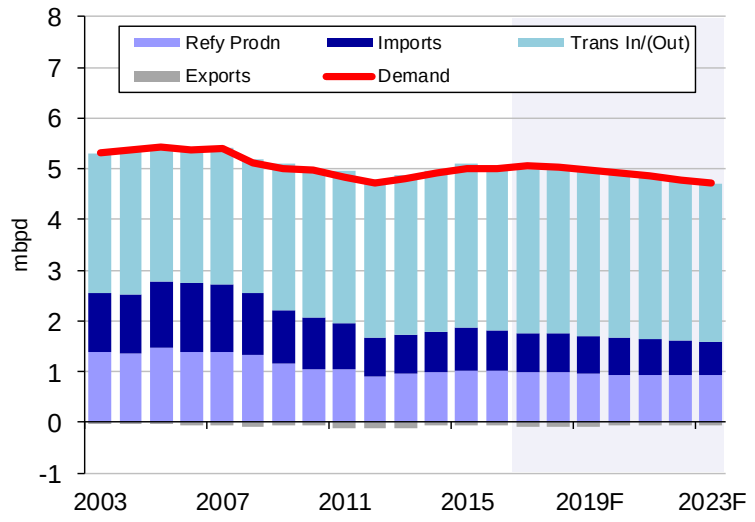
- PADD1 is large product blending centre, heavily reliant on PADD3 transfers
- Lower gasoline demand versus stable PADD3 flows will cut into imports
- Any losses in mid-distillate tanker demand would be more modest

Potential for near-term rise in demand from weather

- Milder winters and ample stocks have suppressed recent import demand
- Return to a normal winter in 17-18 should boost tanker demand…
- …following lower pipeline transfers from PADD3 due to Harvey

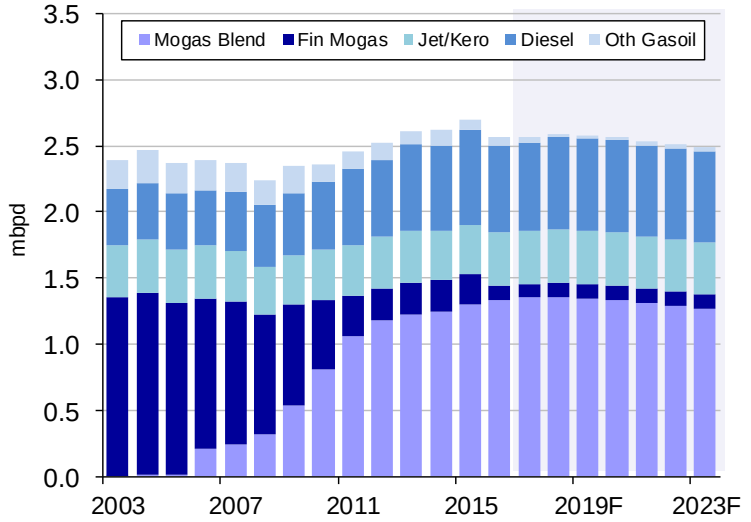
Despite local refining angst, PADD1 has relied on receipts from other PADDs to meet most of its clean product demand

PADD1 Clean Product Balance



Sources: EIA, Makai

PADD3 to PADD1 Clean Pipeline Movements

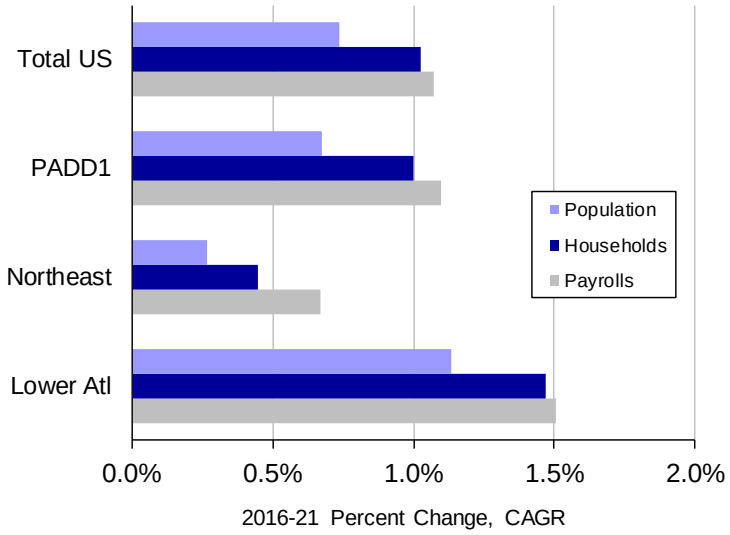


Sources: EIA, Makai

- PADD1 remains a huge product blending centre, with deliveries ex-refinery gate only meeting 20% of regional demand
- Inter-PADD transfers from other PADDs provide the bulk of material for meeting its product demand
- Pipeline shipments from PADD3, via the Colonial & Plantation lines, represent 80% of these transfers
- Our Base Case assumes that pipeline deliveries ease slightly, but with rising Jones Act flows, squeezes out PADD1 imports amidst a declining demand environment

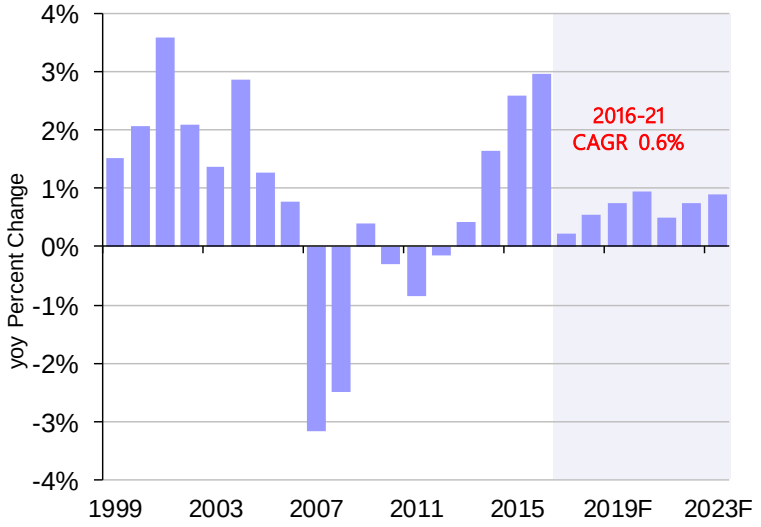
Weak demographics suppress Northeast oil demand, while vehicle miles travelled loses its low price impetus

Key Demographic Statistics, by Region



Sources: US Census Bureau, US Bureau of Labor Statistics, EIA, Makai

PADD1 Vehicle Miles Travelled, yoy Pct Chg



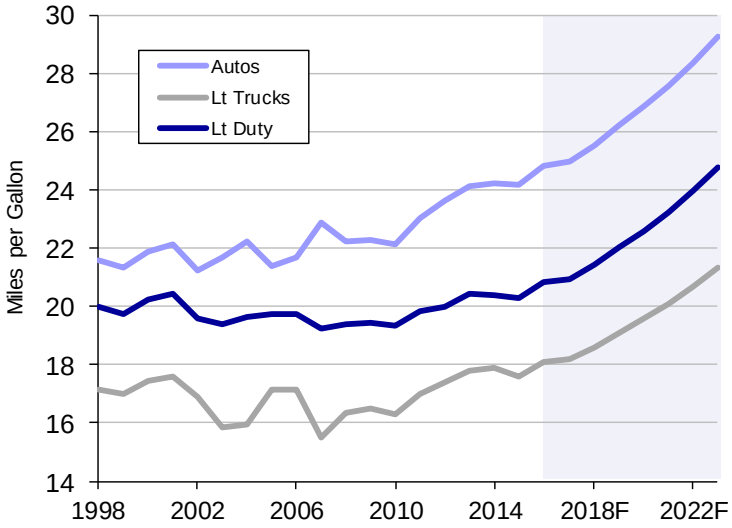
Light-duty vehicles

Sources: FHWA, EIA, Makai

- Although PADD1 demographics mirror the national averages, the Lower Atlantic region continues to attract capital, jobs and people, who are fleeing the high-tax regime states of the Northeast
- A slight uptick in car penetration per household would allow PADD1 vehicle fleet growth to average 1.3% during the period, an acceleration from the 0.8% pace in 2011-16
- Average mileage per vehicle peaked in 2016, with the trough in gasoline prices, but with the recovery in gasoline prices during 2017, mileage was already running 1.1% lower yoy in 1h17
- Continued declines in average mileage should keep PADD1 vehicle miles travelled subdued

Continued penetration by electric vehicles would boost apparent fuel economy and suppress PADD1 gasoline demand

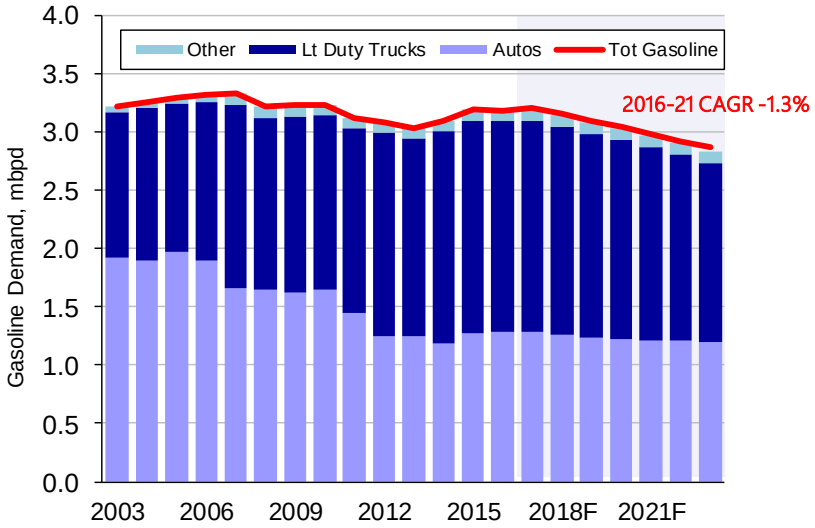
Effective Fleet Fuel Economy, by Vehicle



US averages, EIA Reference Case

Sources: FHWA, EIA, Makai

PADD1 Gasoline Demand, by Vehicle

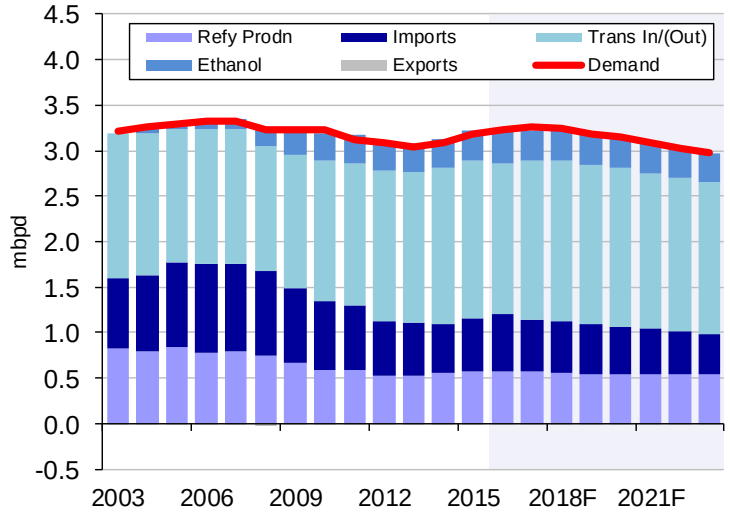


Sources: FHWA, EIA, Makai

- As EVs and hybrids continue to gain share within the US automotive fleet, apparent fuel economy will increase sharply, as more VMT are met without incremental gasoline consumption
  - These figures are not average fuel economy for the gasoline fleet
- PADD1 EV penetration should outpace the national averages, given its urban density, shorter travel distances and supportive EV charging infrastructure
- Although VMT should show minor growth in PADD1, rising fuel economy would suppress actual gasoline demand, forcing it lower by 1.3% per year over 2016-21

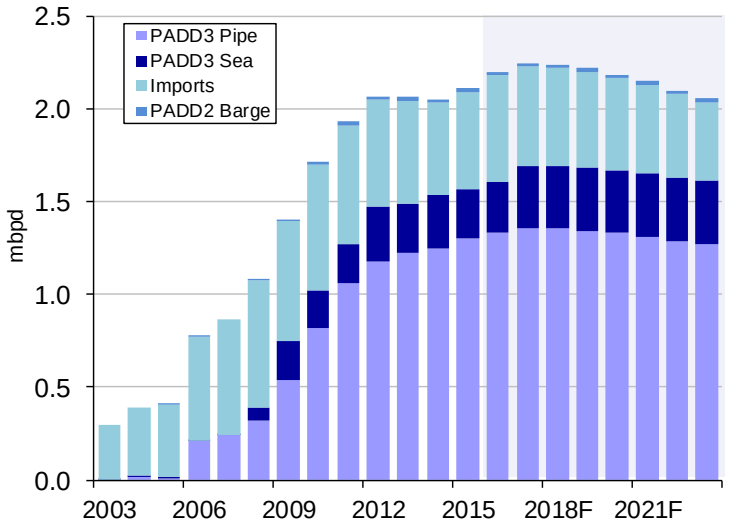
As a large gasoline blender, continued pipeline & Jones Act receipts would pressure import demand

PADD1 Gasoline Balance



Sources: EIA, Makai

PADD1 Gasoline Blendstock, by Source

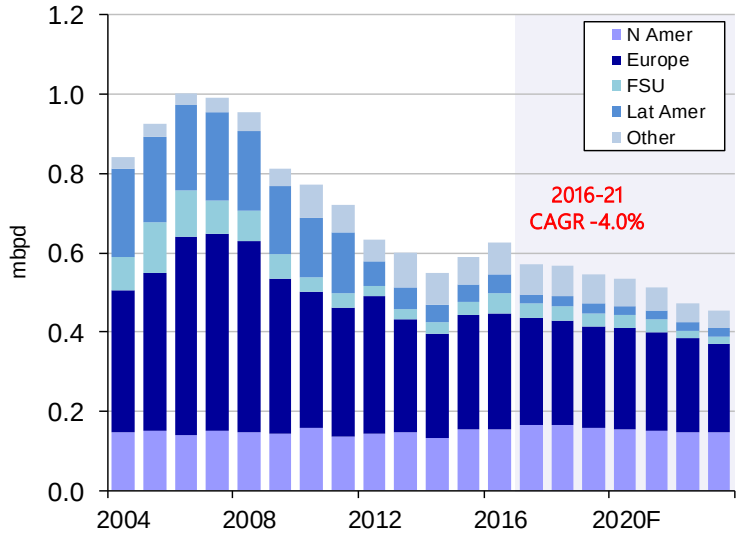


Sources: EIA, Makai

- Product blenders provide the majority of finished gasoline supplies to PADD1, with a modest level of deliveries ex-refinery gate (50-60 kbpd), plus 500 kbpd of blendstock from refiners to blenders
- So the blenders are behind the majority of blendstock imports and transfers from other PADDs, including 300 kbpd of ethanol from PADD2
- PADD1 relies heavily on PADD2/3 transfers to meet 60% of its gasoline demand, with pipeline shipments via the Colonial & Plantation pipelines providing the bulk of these needs
- Stable pipeline and rising Jones Act receipts would pressure blendstock import requirements

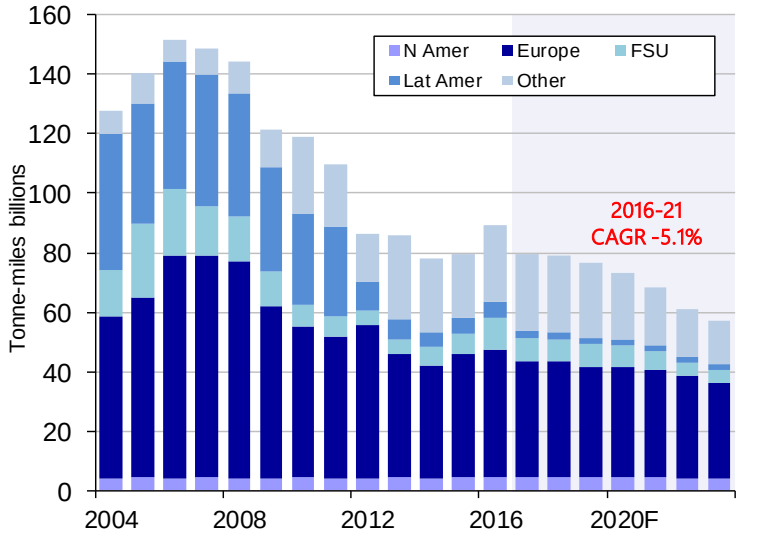
PADD1 gasoline tanker demand poised to drop 40% over the next seven years, from 2016 levels, on reduced demand

PADD1 Total Gasoline Imports by Region, kbpd



Sources: EIA, Makai

PADD1 Gasoline Import Tonne-miles, billions

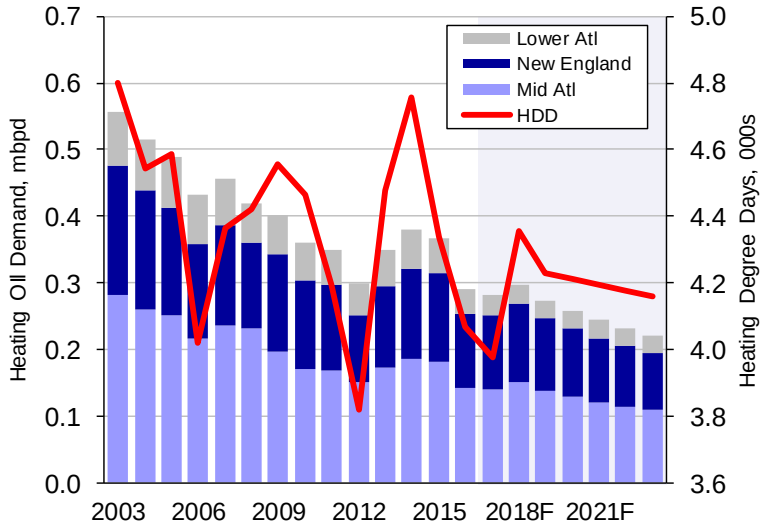


Sources: EIA, Makai

- Although total gasoline imports should remain above 0.5 mbpd through 2020, the sharp decline in demand should drive imports towards 0.3 mbpd by 2024
- Depending upon EC Canada refinery utilisation and exports, the drop in PADD1 imports should hit European refiners harder, encouraging additional capacity rationalisation
- By 2024, gasoline import tanker demand could shrink by 40% from 2016 demand levels, and by 30% from 2017 forecast tonne-mile demand

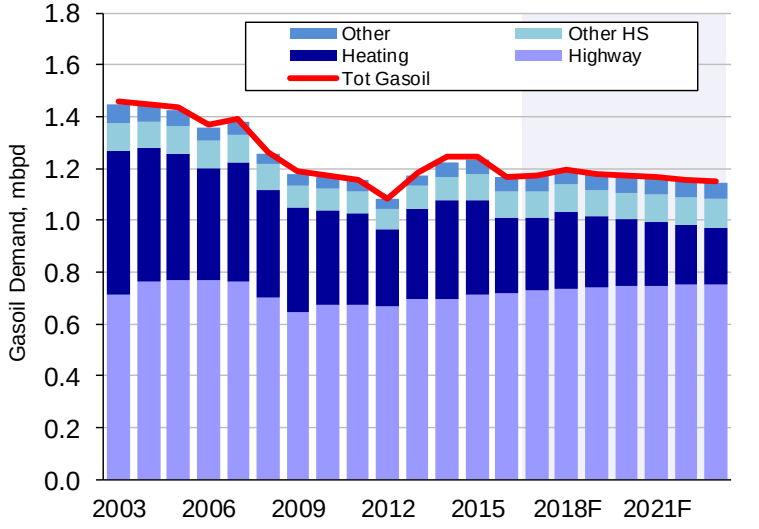
Structural decline in heating oil use would offset rising highway diesel consumption, keeping gasoil demand flat at best

PADD1 Heating Oil Demand by Region



Sources: EIA, Makai

PADD1 Total Gasoil Demand by Use

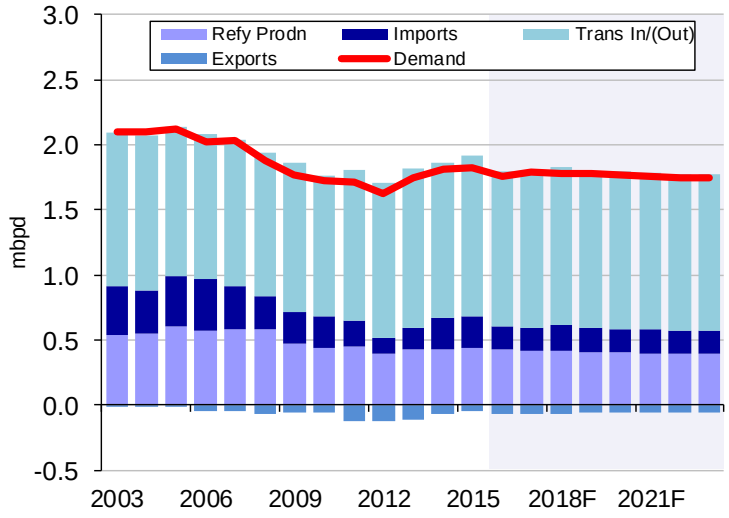


Sources: EIA, Makai

- Slow household formation, and heating oil use dropping to 20% of homes, would send heating oil demand lower by 3.1% per annum through 2021, despite recovery in heating demand days
- Although highway diesel demand should continue to rise, the decline in overall heating oil usage would limit total gasoil demand and provide declines after 2018
- ULSD demand dominates gasoil consumption following the spec changes

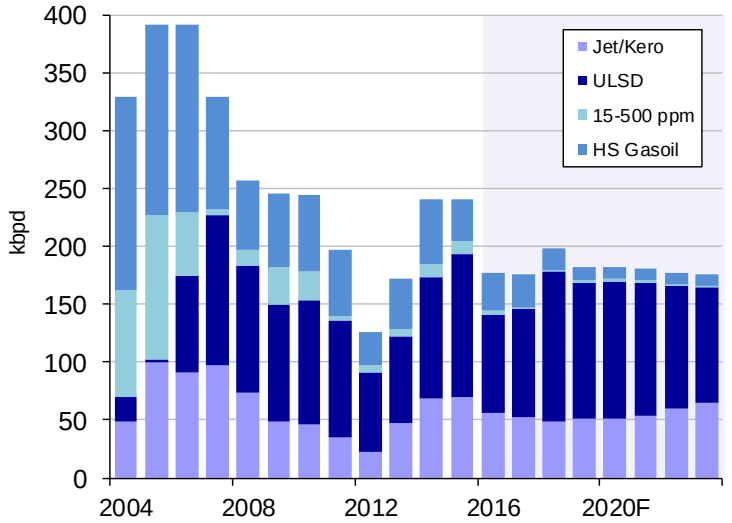
Similar to its gasoline needs, PADD1 relies on receipts from other PADDs to meet the majority of its middle distillate demand

PADD1 Mid-distillate Balance



Sources: EIA, Makai

PADD1 Mid-distillate Imports

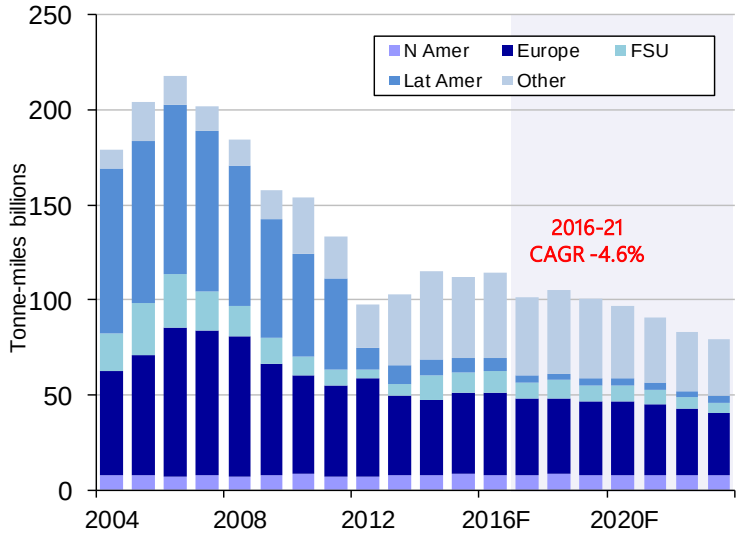


Sources: EIA, Makai

- PADD1 relies heavily on inter-PADD transfers for meeting its mid-distillate demand, with the Colonial and Plantation pipelines providing the bulk of these needs
- Cold weather drove a 120-kbpd jump in mid-distillate imports between 2012 and 2014, led by ULSD, despite a reduction in days' inventory
- Sustained imports in 2015 drove mid-distillate stocks to 40 days of demand, close to previous highs, but mild winters and stabilising stock levels brought imports back to earlier levels in 2016-17
- This season should be closer to normal HDDs, providing a recovery in heating oil demand and imports

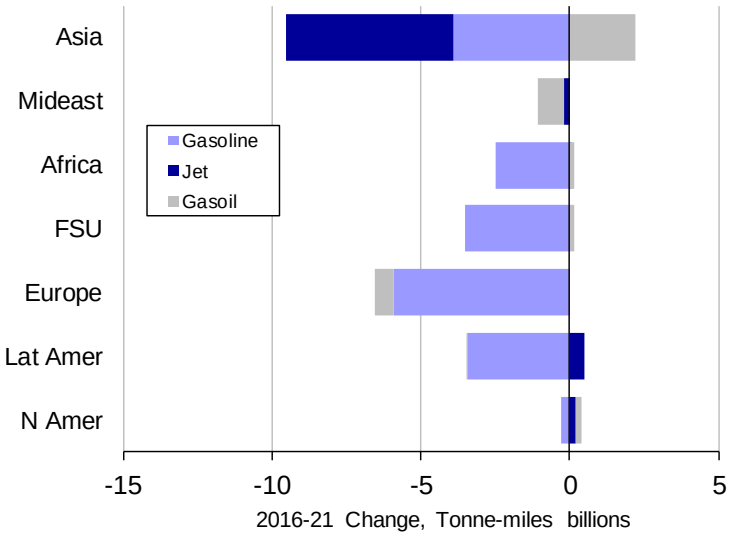
As urgency for long-haul sources declines, Asian imports would lead the drop in PADD1 clean tonne-mile demand

PADD1 Clean Import Tonne-miles, billions



Sources: EIA, Makai

Clean Tonne-miles, by Region & Grade 2016-21

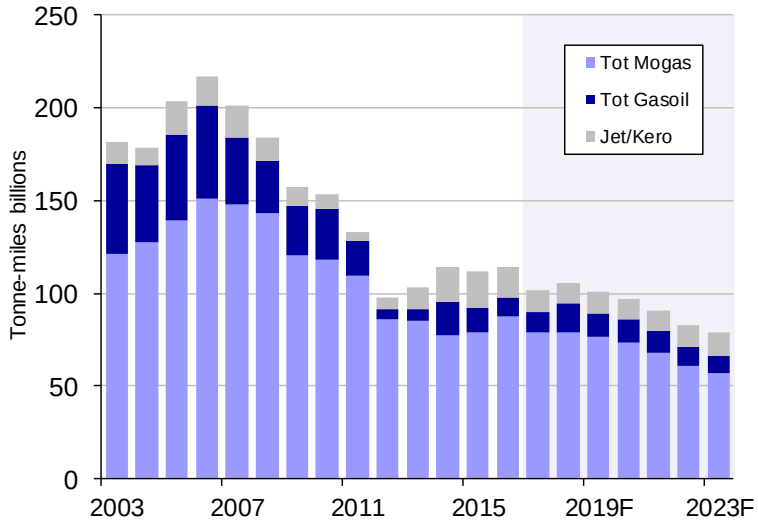


Sources: EIA, Makai

- Diminished Asian jet needs hitting tonne-mile demand, with the majority of losses in 2017, from Indian declines leading the process, followed by Korean volumes
- Indian gasoline dominates Asian sources, so would lead the tonne-mile plunge from that region
- Drop in traditional European gasoline imports would also hit tanker demand
- Gasoline drives more than 80% of tonne-mile demand losses through 2021
- By 2024, PADD1 clean tanker demand would be roughly two-thirds of 2016 tonne-mile levels

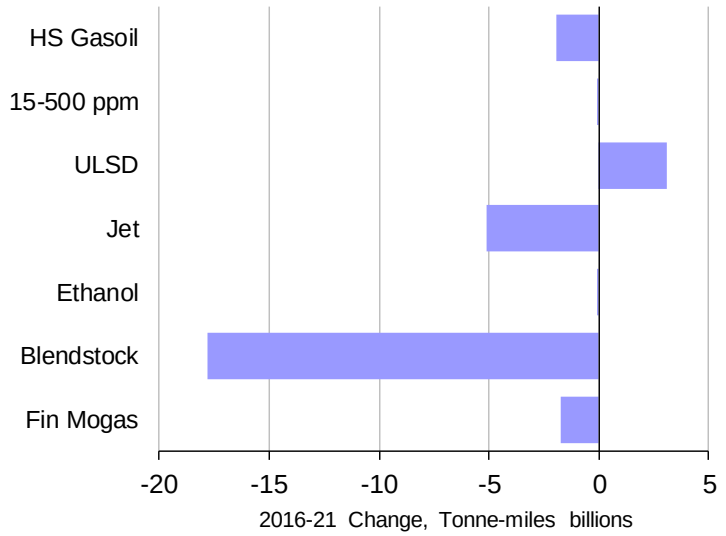
Structural declines in gasoline demand are driving the losses in PADD1 clean tanker demand in later years

PADD1 Clean Import Tonne-miles, by Grade



Sources: EIA, Makai

PADD1 Clean Tonne-miles, by Grade 2016-21

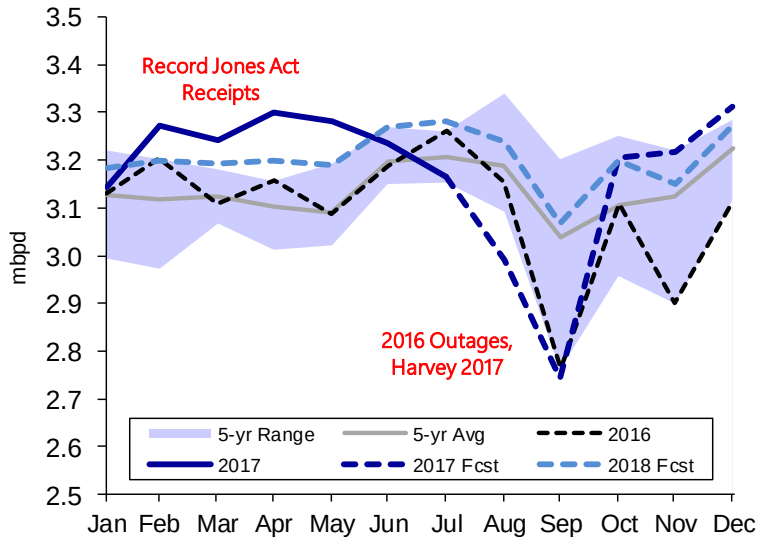


Sources: EIA, Makai

- Diminished need for gasoline imports would send PADD1 clean product tanker demand to only 66 billion tonne-miles by 2023, or 57% of 2016 levels
- PADD1 gasoil tanker demand would actually rise slightly for 2016-21
- A plunge in gasoline blendstock imports would dominate the tanker demand losses over the period

PADD1 clean imports should rebound in 4q17, following Harvey, with drop in transfers from PADD3 and inventory declines

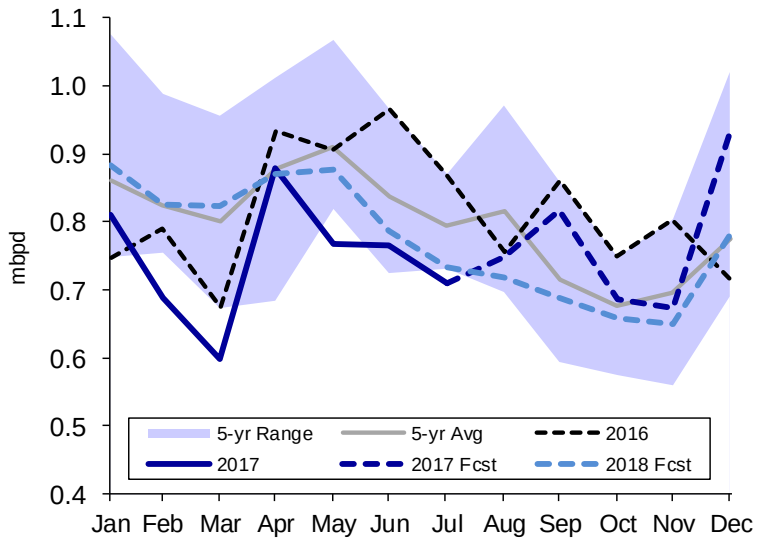
PADD1 Clean Product Transfers from PADD3



Includes pipeline and tanker/barge

Sources: EIA, Makai

PADD1 Total Clean Product Imports

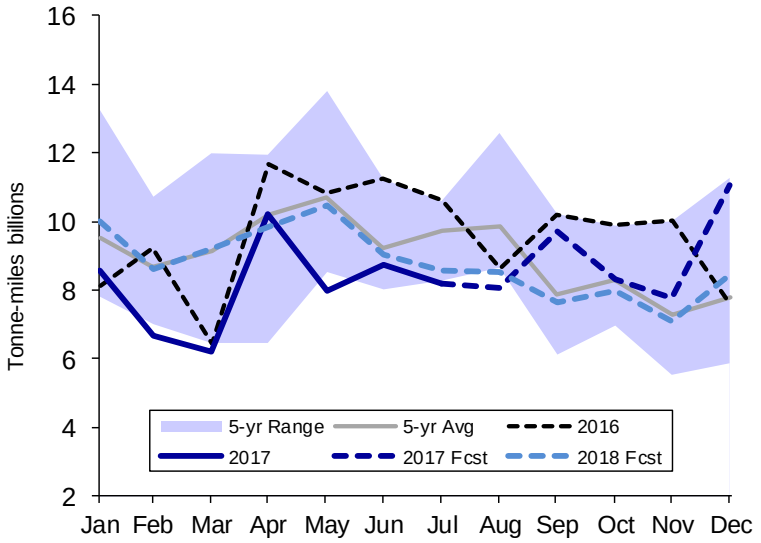


Sources: EIA, Makai

- Record Jones Act tanker & barge movements from PADD3 to the Lower Atlantic region pressured PADD1 clean product imports in early-2017
- A rebound in inventories during April 2017 allowed imports to surge towards 900 kbpd, but resumption of stock draws had limited imports until Harvey hit PADD3
- PADD1 imports should recover in 4q17, following drop in transfers from PADD3 due to Harvey, as inventories stabilise and then post a seasonal rise

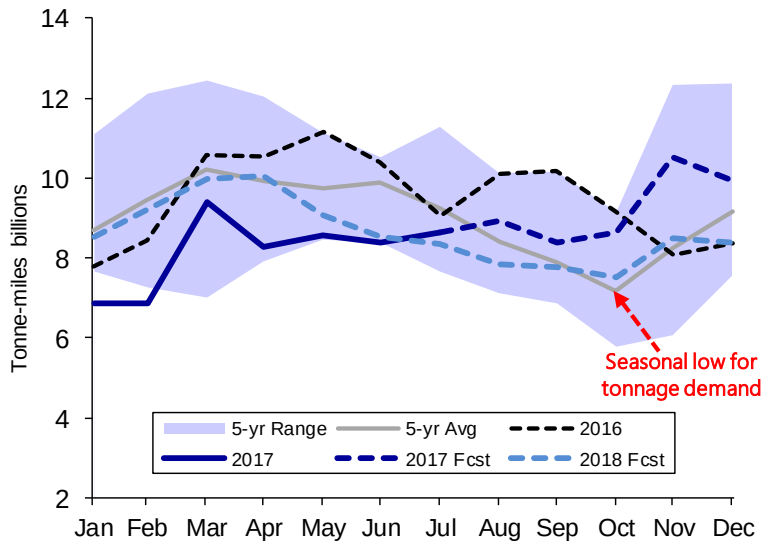
PADD1 clean product import tonne-mile demand could see meaningful rise during late-4q17

PADD1 Clean Tonne-miles, Discharge Basis



Sources: EIA, Makai

PADD1 Clean Tonne-miles, Fixture Basis



Sources: EIA, Makai

- Provided clean product transfers from PADD3 remain below early-2017 levels, import demand should rebound in December 2017, from higher ULSD demand and stock builds
- In addition to traditional shipbroker methodology of calculating tonne-mile demand on discharge volumes, we estimate tonne-mile demand at the time of fixture
  - Calculation is based upon transit times and typical time lag between fixture and laycan
- On this basis, tanker demand could be 30% higher in November than summer levels

Conclusions

TC2 to shrink in importance in global clean tanker trade

- At its peak in 2007, PADD1 clean imports represented more than 10% of global clean tanker tonne-miles
- By 2023, this share should drop to below 2% of global clean demand

Declining gasoline imports to cut into MR demand

- Shrinking gasoline consumption is key driver in tanker demand decline
- Traditional sourcing from Europe drops, cutting into MR demand, with this region representing half of total PADD1 MR losses through 2021

Lower Indian jet & gasoline imports hitting LRs

- Reduced PADD1 jet requirements have already cut into Indian sourcing, reducing tonne-mile demand by 75% yoy
- Indian gasoline imports also much lower in 2017, but set to decline further

Additional refinery closures could support imports

- Renewed weakness in margins may force additional PADD1 and/or ECC refinery rationalisation
- In modelling scenarios, moderate closures do not eliminate import declines, just flatten the trajectory briefly

Jones Act fleet additions posing near-term threat

- With pipeline flows from PADD3 to PADD1 stable, new Jones Act volumes are displacing imports in Lower Atlantic
- Additions will slow, with no new ordering, but two APT vessels yet to arrive

Hedge effectiveness of TC2, as real volumes decline?

- As physical, underlying volumes of NWE-USAC cargoes underpinning TC2 contract fall, lower liquidity could affect broker assessments
- Lower physical liquidity could impair effectiveness of TC2 as hedge

Disclaimer

This memorandum is for informational purposes and is not intended as an offer or solicitation with respect to the purchase or sale of any security. This report and the information contained herein may not be reproduced or redistributed, in whole or in part, without the written permission of Makai Marine Advisors Ltd (Makai). Although the statements of fact have been obtained from and are based upon sources Makai believes reliable, we do not guarantee their accuracy, and any such information may be incomplete. All opinions and estimates included in this report are subject to change without notice.

Makai, its affiliates and their respective officers, directors, members and employees, including persons involved in the preparation of this memorandum, may from time to time maintain may act in the capacity as advisor(s) of companies mentioned in this memorandum. Neither Makai nor any officer or employee of Makai, or any affiliate thereof, accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of this memorandum or its contents.

Contact Information

Makai Marine Advisors Ltd
1 Ivy Cottages
St. Leonard's Hill
Windsor, Berks SL4 4AW
United Kingdom

UK Mobile +44 7932 535 453
jmcgee@makaimarine.com

www.makaimarine.com

Twitter: @MakaiMarine