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12.c. APERC Oil Report 2018

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Topics of Presentation

Demand

- APEC vs Global
- APEC Demand Outlook

Supply

- APEC vs Global
- APEC Supply Outlook

Key Factors Influencing Oil Market

- US Shale Oil Development
- Refining Capacity Additions in SEA and ME
- Crude Oil Price

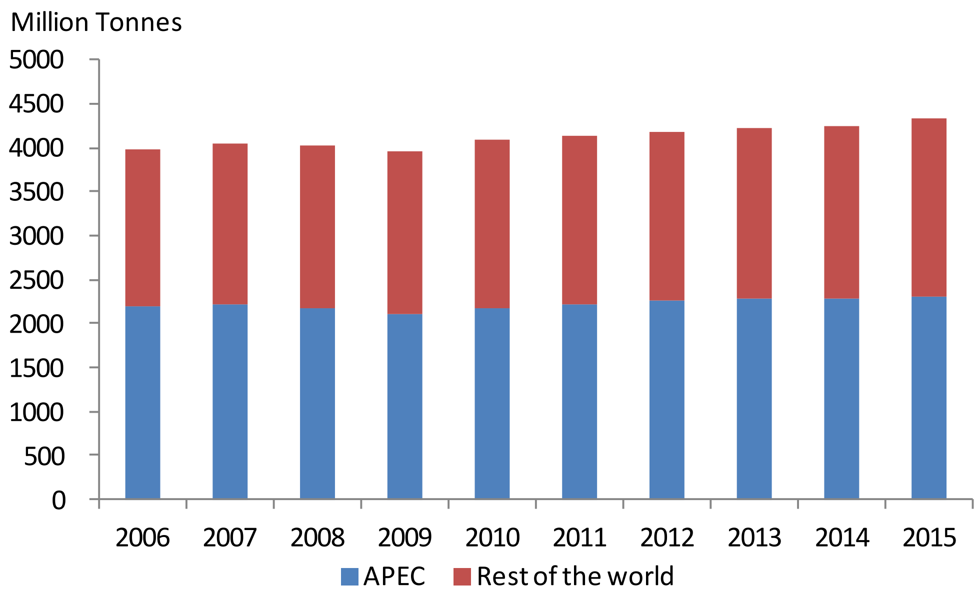
Environmental Issues

- Gasoline and Gas Oil Trade Restriction
- IMO's 2020 Sulphur Cap

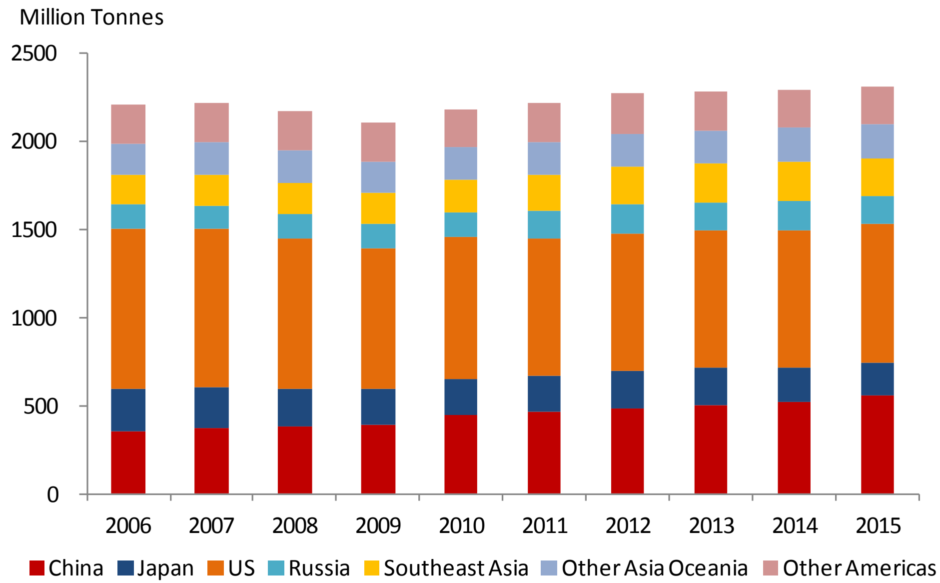
APEC Import Dependence

APEC vs Global Demand

APEC vs Global Demand 2006-2015



APEC Demand 2006-2015



Global oil consumption reached 4,341 million tonnes in 2015 (0.9% p.a. for 2006-2015).

APEC accounted for 53% of global demand in 2015.

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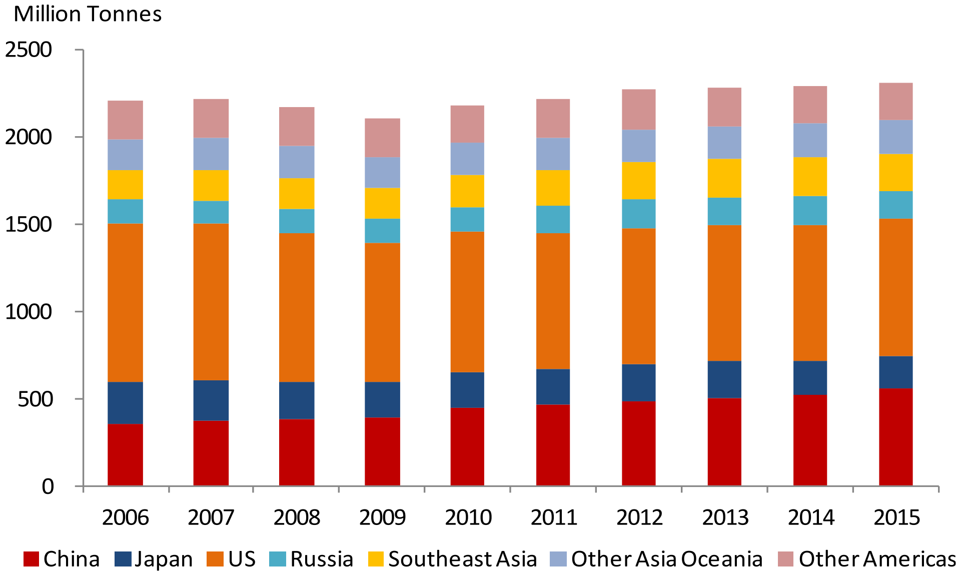
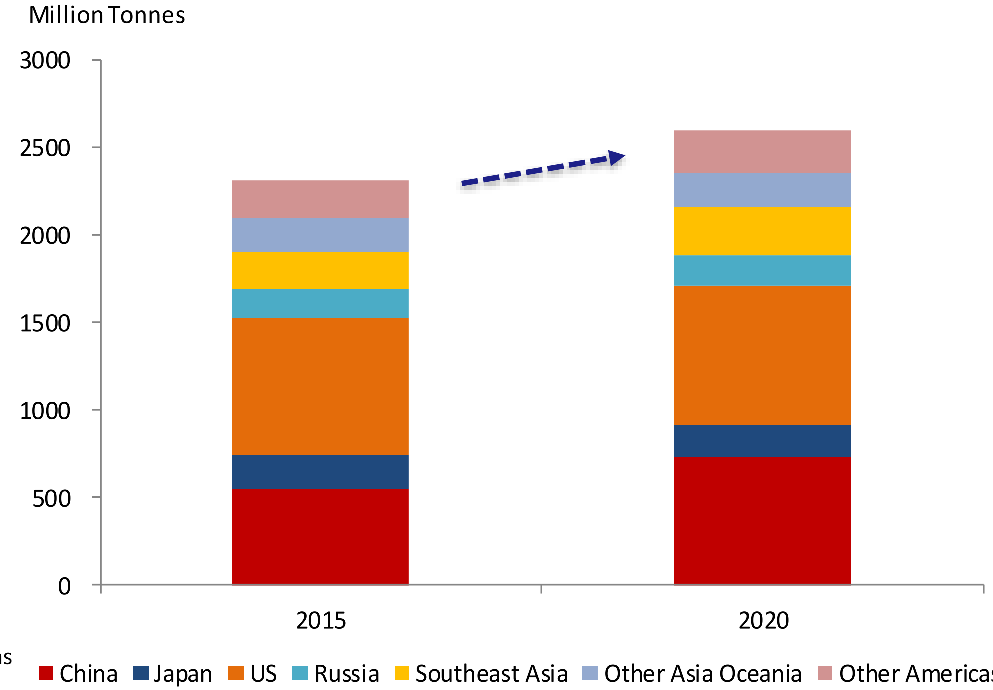
APEC Demand Outlook 2020

APEC Demand 2006-2015



APEC Demand Outlook 2015-2020

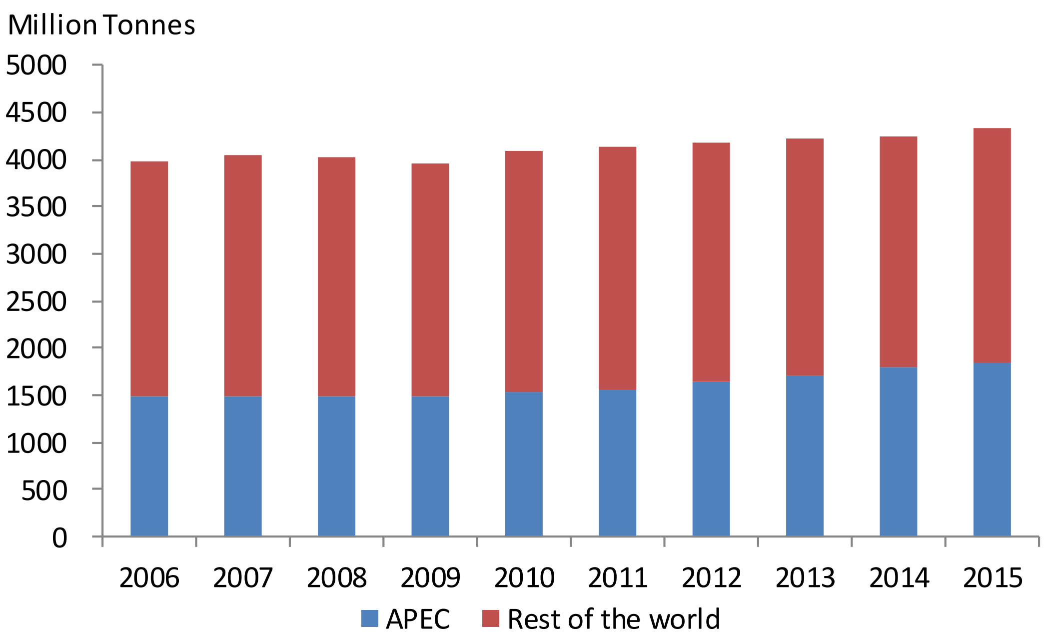


China leads the way in demand growth at 5.7% p.a. towards 2020 contributing to 32% share of APEC vs 25% in the past.

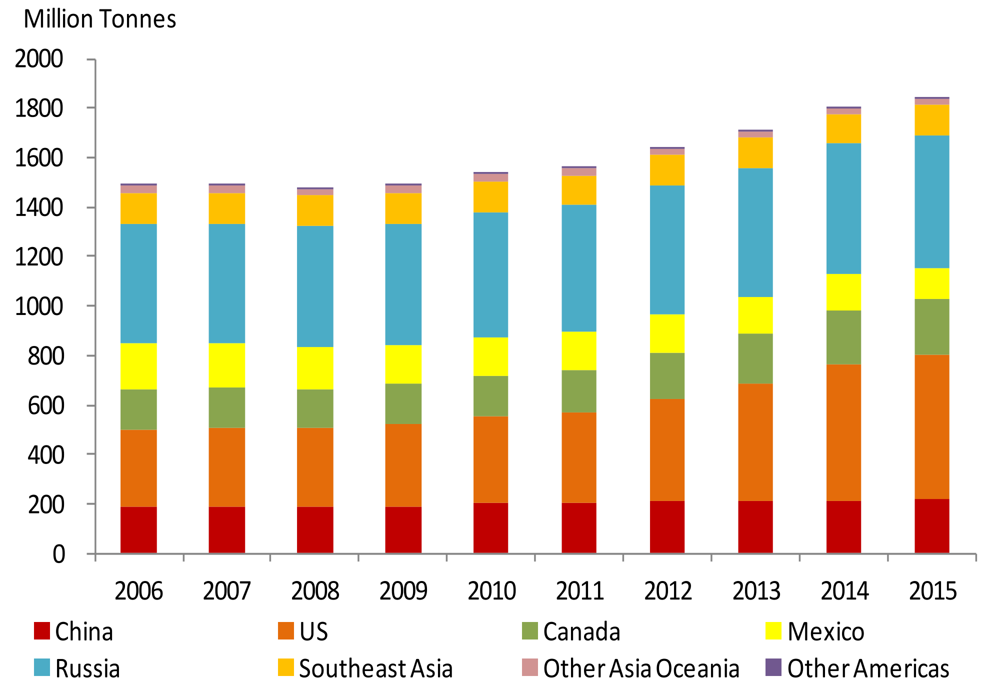
APEC oil demand will shift more to Asia in the coming years.

APEC vs Global Supply

APEC vs Global Supply 2006-2015



APEC Supply 2006-2015

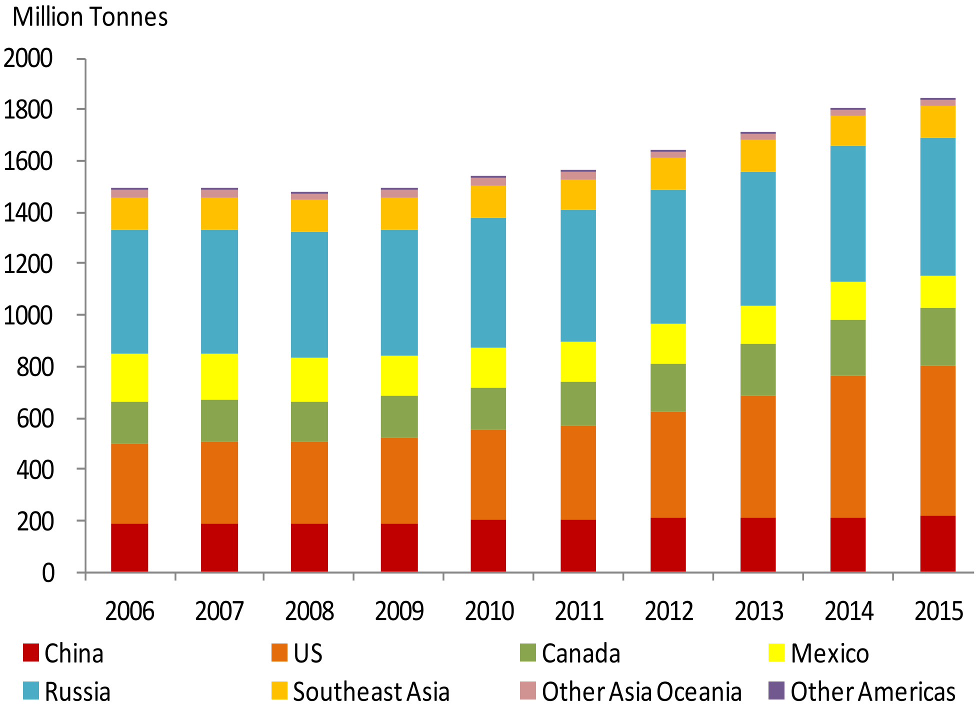


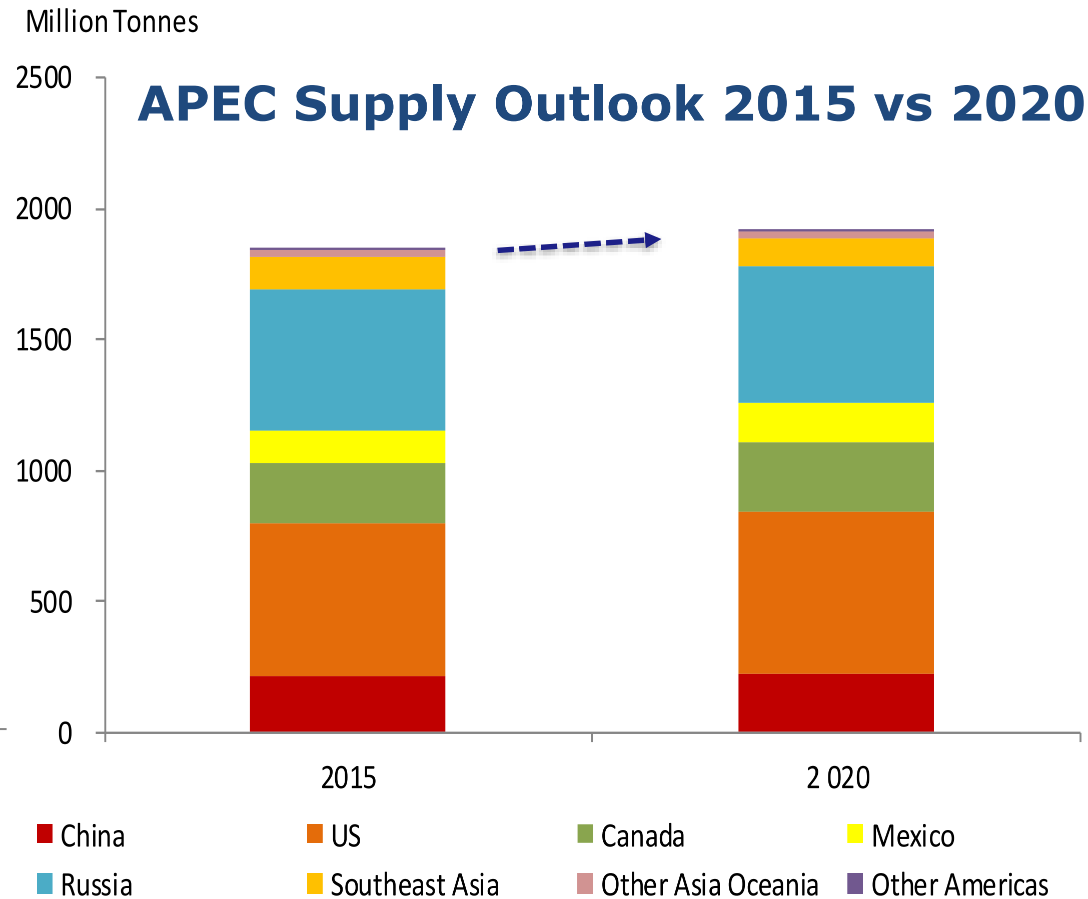
Global oil supply reached 4,359 million tonnes in 2015 (1.0% p.a.).

US and Russia accounted for 61% of APEC supply with 74% of APEC growth contributing from US shale.

APEC Supply Outlook 2020

APEC Supply 2006-2015





APEC Supply
Growth +0.4% p.a.
(1,926 mt @2020)
Supply Center ⇨ North America

APEC Demand
Growth +1.7% p.a.
(2,605 mt @2020)
Demand Center ⇨ Asia

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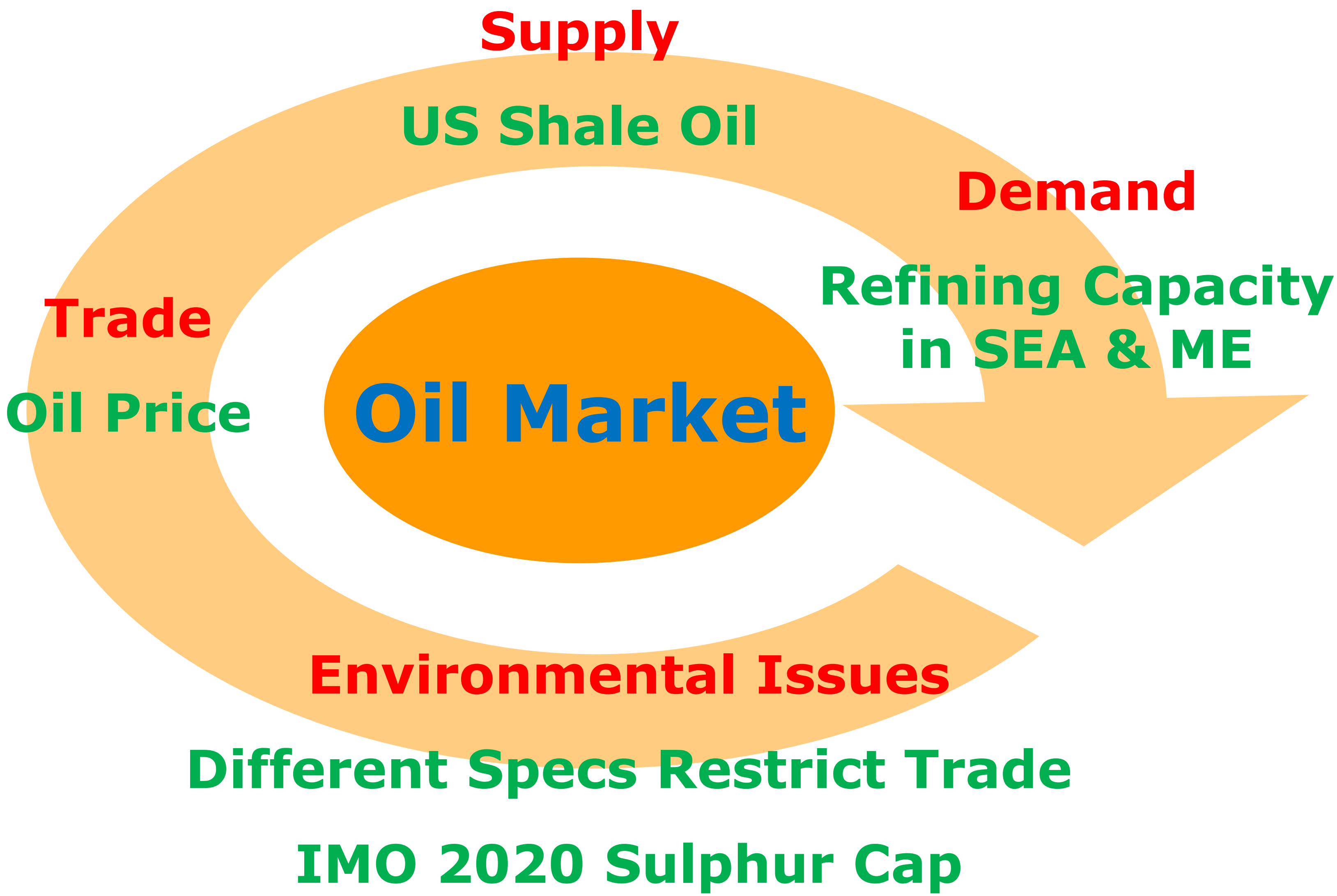
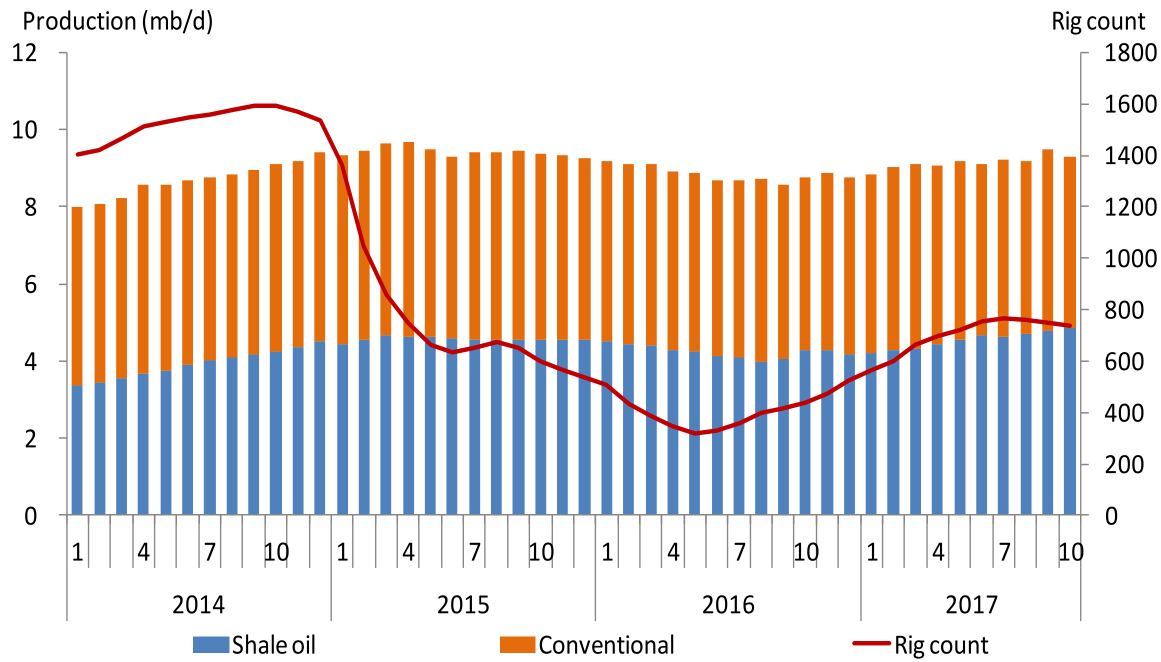
Key Factors Influencing Oil Market



US Shale Oil Development

Shale oil production in US has increased by 80% since 2008.



4.6 mbd in 2017, equivalent to 50% of total US production.

6-8 mbd forecasted in 2030 (EIA-IEA).

US energy balance has transformed into less import dependence due to shale oil boom.

Decreasing breakeven price of shale oil (to US$ 40-50/barrel) increases its potential to be competitive advantage over crude oil.

Sources: EIA and Baker Hughes (2017)

Refining Capacity Additions in SEA and ME

New capacities to be installed in Southeast Asia (SEA) and Middle East (ME) during 2018-2022.

SEA plans to add a combining 1,400 KBD to improve supply security.

ME plans to install a total of 2,600 KBD and replace crude oil export with product export.

Trades are expected to increase along new capacities.

Sources: OGJ November 7, 2016
IEA: 2016 MTOMR

Impact of Crude Oil Price

Drop in oil prices has caused demand to increase in some economies but hasn't boosted economic activities in global scale as much as expected.

Re-balancing of oil supply-demand has shifted focus of international oil market:

oil exporting countries (OPEC, Russia, etc.)

↓

oil importing countries (China, India, Japan, EU, etc.)

Environmental Issue: Gasoline and Gas Oil Trade

Many different quality standards of gasoline and gas oil have been adopted and traded in APEC economies; e.g., EURO III, EURO IV, EURO V and etc.

Gasoline and gas oil trade hampered by differences in their specifications.

Harmonization of APEC oil specifications can alleviate:

- **APEC oil trade optimization**
- **Environmental emissions**
- **Logistics costs**

Environmental Issue: IMO's 2020 Sulphur Cap

New tanker regulations to limit sulphur content (3.5% to 0.5%) on marine fuels to be enforced in 2020.

Low Sulphur Fuel Oil (LSFO) can be produced several ways: cracking FO to GO, sweeter crude slate, and desulfurizing FO.

- Estimated $30/mt premium for 0.5% FO[1].
- Costs are expected to be borne by refiners, crude producers, shipowners and bunker suppliers.

Demand shift of 2 mbd FO to GO[2].

- Change in trade flows as regional disparities in compliant bunker fuel output are expected.
- New refinery upgrades in the ME are expected to lead to a surplus of compliant FO, while North America, Africa and Asia-Pacific are expected to be in deficit.

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Note: 1. Based on 195 million tonnes FO switching from 3.5% to 0.5% (5,000 ppm).
2. Based on marine fuel consumption in international shipping at 3.9 mbd in 2020 (30% FO and 70% GO).

Thank You for Your Attention

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