Industry Outlook 2016

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Speakers

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Presented By:
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US Economy: inventories and a strong dollar dragging down growth

As of 30 Oct 2015¹

**Key Uncertainties**

**Leveraging/Deleveraging**
- Household debt service ratio of 10.1% in Q2
- Govt. surplus of $0.6 bn in Sep

**Health of Consumers**
- Unemployment rate of 5.1% in Sep
- Consumer confidence dropping to 97.6 in Oct from 102.6 in Sep
- New home sales of 468,000 in Sep

**Health of Financial Sector**
- Consumer credit growth remaining at 6.8% in Aug
- TED spread remaining at 0.3% in Oct

**Trade/Forex Imbalances**
- Exports contracting 2.0% mom in Aug compared with +0.6% mom in Jul
- Imports expanding 1.2% mom in Aug compared with −1.0% mom in Jul

**Policy & Health of Public Sector**
- 10-year Treasury yield remaining at 2.1% in Oct
- Govt. bond issuance increasing to $828.5 bn in Q3 from $748.4 bn in Q2

¹ Or last available data point
Euro Area Economy: slow recovery continuing on the back of the ECB’s QE

As of 30 Oct 2015

Key Uncertainties

- **Leveraging/Deleveraging**
  - Public sector debt of 92.2% of GDP in Q2

- **Health of Consumers**
  - Unemployment rate of 10.8% in Sep
  - Consumer confidence of -7.7 in Oct

- **Health of Financial Sector**
  - Outstanding loans to private sector contracting 0.3% mom in Sep, compared with -0.5% mom in Aug
  - Banking sector CDS decreasing to 413.1 bps in Oct from 432.7 bps in Sep

- **Trade/Forex Imbalances**
  - Export growth of 5.5% yoy in Aug
  - Manufacturing PMI rising to 52.3 in Oct from 52.0 in Sep

- **Policy & Health of Public Sector**
  - Govt. bond yield spread of Greece of 7.4% in Oct
  - Greece CDS decreasing to 1,137.9 bps in Oct from 1,204.4 in Sep

1 Or last available data point
Chinese Economy: growth slowing down amid reforms and property slump

As of 30 Oct 2015

Key Uncertainties

Leveraging/Deleveraging
- Public sector debt of 55% of GDP in 2013

Health of Consumers
- Housing sector showing some weakness, as new property price growth decreased and real estate climate index dropped slightly in Sep
- Retail sales growth of 10.9% yoy in Sep

Health of Financial Sector
- New credit issuance of RMB 1,050 bn in Sep
- M1 and M2 expanding 0.4% mom and 0.2% mom, respectively, in Sep

Trade/Forex Imbalances
- Export growth of -3.7% yoy in Sep
- New export orders PMI dropping slightly to 47.4 in Oct from 47.9 in Sep

Policy & Health of Public Sector
- RRR of 17.5% for major banks in Oct

1 Or last available data point
Global Economic Outlook: adjusting to lower commodity prices

CLIs pointing to outlook of moderating growth in most major economies

United States

Growth losing momentum

Euro Area

Stable growth momentum

China

Growth losing momentum

Source: OECD as of Nov 9, 2015

IMF, in Oct 2015, projecting the global economy to grow 3.1% in 2015 and 3.6% in 2016

<table>
<thead>
<tr>
<th>GDP 2014</th>
<th>Share of World GDP in 2014</th>
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<tbody>
<tr>
<td>$ 77.3 Tn</td>
<td>22.5% 17.3% 6.0% 13.4% 2.7% 3.0% 2.4% 2.7%</td>
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</table>

Source: IMF (Oct 2015)

Note: 1/ ASEAN-5 = Indonesia, Malaysia, Philippines, Thailand, and Vietnam
Thai Economy: growth to pick up gradually amid higher public spending and robust tourism

**Exports showing signs of stabilizing**
Exports in dollar terms

**Tourism as a key driver of growth**
Number of tourists

**Private investment remaining sluggish**
Private Investment Index

**Private consumption beginning to rebound**
Private Consumption Index

**Govt. stimulus measures since Sep 1, 2015**

**Measures for rural boost**
- Soft loans via village funds worth 60 bn baht
- A budget of 36 bn baht for sub-districts
- 40 bn baht worth of small govt. projects

**Real estate sector stimulus package**
- GHBank to receive a 1-year 10 bn baht budget to provide low-income earners with housing loans
- A reduction of transfer fees and mortgage fees to 0.01% from 2% and 1%, respectively, for 6 months
- First-home buyers to deduct taxable income with 20% of home value for a period of 5 years

**Measures to instill investor confidence and Thailand’s competitiveness**
- Corporate income tax permanently reduced from 23% to 20%
- Additional tax incentives to industries in the super clusters/clusters
- 10-year corporate income tax and dividend tax exemptions for govt. venture capital funds
- Businesses allowed to double their capex deduction for corporate income tax until end-2016
- BOI tax benefits for private investment with actual investment by end-2017

**Govt. infrastructure investment**
- Construction of 2 medium-speed railway routes under a Thai-Chinese agreement, worth 400 bn baht, from Nong Khao to Map Ta Phut and from KaengKhoi district to Bangkok, to begin in May 2016, with a groundbreaking ceremony in Dec
- The cabinet on Nov 3 agreeing to fast-track 8 investment projects designated for 2016 and 2017 worth 347 bn baht

**Thai economy expanding 2.9% in Q3’15**

**PTT GDP Forecast**

Source: PTT CGE model
Oil & Refining

Presented By:

Anintita Praokaew

Team Leader

Business Planning and Subsidiary Management Department
2015 OIL MARKET RECAP

Russia seized control of Crimea
IS Invasion
OPEC maintain production ceiling

2013 ICE Brent — 2014 ICE Brent — 2015 ICE Brent

Large inflows of investor fund into oil

China Stock Market Crash

Price rebound from technical

First Bottom Jan’15
Yemen Crisis

Second Bottom Aug’15
Iran Nuclear Agreement

Crude Inventories*

* Commercial inventories from U.S., EU, Singapore and Japan

Source: PTT International Market Analysis Team, Reuters, Bloomberg, EIA, PAJ, IES, PJK
SUPPLY

**NON-OPEC**

In 2016, Non-OPEC Declines and U.S. Shale Growth Slows Significantly...

**OPEC**

OPEC Declines and U.S. Shale Growth Slows Significantly...

**U.S. Crude Production VS Rig Count**

Source: PTT International Market Analysis, PIRA, Citibank, DOE, Baker Hughes
Demand growth slowdown in 2016 is becoming evident as economic slowdown hampers demand.

Low oil price in 2015 stimulates demand growth, especially in U.S., China and Europe. However, growth is expected to slowdown as economic landscape dragged down overall demand.

Light ends demand especially gasoline shoots up in 2015 and expected to remain strong towards 2016 while gasoil growth which more related to global economy falls behind.

Source: PTT International Market Analysis Team, DOE, IEA, OPEC, Vitol, PIRA
REFINING BUSINESS

THE GOLDEN AGE REMAINS?

- Slowing global economy causes projects stalling. Lower refining capacity additions than earlier is expected before oil prices begin to flatter, especially in China.
- High crude inventories will continue to give refinery sector an edge over other sector in the energy business.
- PTT expects 2016 refinery margins remain stable compare to year 2015.

Source: PTT International Market Analysis Team, Energy Aspects, IEA
Converging and rebalancing

During 2014 to 2015 was the longest streak of oversupply market. Supply and demand already started to converge and form a new balance of oil price.

- Starting from 4Q’15, fundamentals will start to converge to a new equilibrium. However, an inevitable supply from Iran will still push the rebalancing further to 2017.

- In 2015 and 2016, the world will experience two consecutive years of Capex cut. Thus, in 2017 price needs to go up in order to support new projects and maintain production.

Source: PTT International Market Analysis Team, DOE, IEA, OPEC, PIRA
Bearish global economy But Demand Growth remains.

Shale cutback offsets Rising OPEC Supply.

Due to stock over hang, the market will start to tighten in 2H16.

FED Tightening Policy encourages volatile capital flow.

Sources: PRISM Business Plan (Oct.,15), IEA, EIA, OPEC, PIRA
LNG & Gas

Presented By:

Dulyapun Buranawit

Team Leader

Liquefied Natural Gas Supply Department
LNG Price Outlook and Key Drivers 2016

**New LNG demand from emerging countries in South East Asia, Middle East, and Eastern Europe**

**Positive outcomes from United Nation climate change conference in Paris (Nov)**

**Faster-than-expected depletion of indigenous gas in Europe/Asia/South America**

**EU policy for guidance of emission trading system (EU ETS) and gas diversification from Russia**

**New LNG supply from Australian and US projects (GLNG, APLNG, Gorgon, and Sabine Pass)**

**Restart of nuclear power plants in Japan and new commercial operation plants in Korea**

**Wildcard LNG projects in Angola and Yemen might start up their production in 2016**

**Existing gas price structures in India and China discourage domestic gas consumption**

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**Unit Price Projection**

- **Henry Hub (HH)** 2.7 – 3.2 USD/MMBtu
- **Spot LNG Price** 6 – 7 USD/MMBtu
- **Long term LNG Price** 7 – 9 USD/MMBtu

**Remark**

- HH excludes liquefaction fees and freight costs
- Price divergence

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**Source:** Wood Mackenzie, PIRA

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**Graphs and Charts:**

- Henry Hub Outlook 2016
- LNG Price Outlook 2016
Petrochemical

Presented By:
Ekachai Sirithammasan
Vice President
Petrochemicals Subsidiary Planning & Management Department
Olefins Outlook:
Ethylene/PE: Margins to be Softer than This Year

- Ethylene/PE capacity growth concentrates in low cost and high demand regions i.e. North America, Middles East, and Asia (mainly from China)
- Fall in crude oil prices changed the competitive landscape

![Graph showing 2016 Ethylene New Capacity Outpace Demand Growth](chart1)

![Graph showing HDPE Operating Rate Start to Decline in 2016](chart2)

![Graph showing Lower Oil Prices Flatten Global Cost Curve](chart3)

Source: IHS
## Olefins Outlook:
Ethylene/PE: Margins to be Softer than This Year

### 2015 Asia crackers by capacity and age

- **China**
- **Japan**
- **Korea**
- **Taiwan**
- **India**
- **SEA**

### Ethylene and PE Margins Slightly Decline

- **USD/MT**
  - **HDPE Price**
  - **Ethylene Price**
  - **HDPE-Ethy.**
  - **Ethylene MOPS**

### Iranian Crackers Run at Low Rate during Sanction

- **KTA**
  - **Operating Rate (%)**

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**Risk emerge after the lifting of Iran sanction next year.**
Iran will return to be one of key players with a very competitive feedstock.

**+ Old and uneconomical crackers in Japan will be closed by 2016 (2 Plants, 1,042 KTA)**

**+ China’s CTO/MTO projects still have several challenges such as limited economic growth, technical issues, environmental issues**
Olefins Outlook:
Propylene: Oversupply from New On-purpose Units Depresses Margin

2016 global operating rate will decline both of Propylene and PP due to capacity addition of propylene still outpace demand growth since 2014.

According to the Chinese Government self-sufficient policy, numbers of MTO/CTO plants gradually increase supported by subsidies and PDH plants are also gradually started up in China to fulfill future NEA demand growth.

China will be able to improve self-sufficient ratio of PP to above 90% in next 5 years.

Structure Change of PP and Propylene market after huge investment in On-Purpose

On-purpose units have many challenges
  • PDHs in China mostly rely on high cost propane import from Middle East and US.
  • China’s CTO/MTO projects still have several challenges such as limited economic growth, technical issues, environmental issues.
Olefins Outlook:
Propylene: Oversupply from New On-purpose Units Depresses Margin

2015-2019 Propylene capacity additions by sources (30 Million Ton)

- Steam Cracker: 7%
- FCC: 15%
- PDH: 42%
- MTO/CTO: 33%
- Metathesis: 3%

On-Purpose Production, Drive Propylene Market

- 2016 global operating rate will decline both of Propylene and PP due to capacity addition of propylene still outpace demand growth since 2014.
- According to the Chinese Government self-sufficient policy, numbers of MTO/CTO plants gradually increase supported by subsidies and PDH plants are also gradually started up in China to fulfill future NEA demand growth.
- China will be able to improve self-sufficient ratio of PP to above 90% in next 5 years.
- Structure Change of PP and Propylene market after huge investment in On-Purpose
  - On-purpose units have many challenges
    - PDHs in China mostly rely on high cost propane import from Middle East and US.
    - China’s CTO/MTO projects still have several challenges such as limited economic growth, technical issues, environmental issues.
Aromatics Outlook:
PX Market Surplus Pressures Margin

PX Capacity also Outstripped Demand

- 2016 global operating rate will decline as capacity addition still outpaces demand growth
- Overcapacity will force more rationalization
- Lower oil prices reduce production costs

PX spreads are expected to be held at low levels

PX Cost and Competitiveness

Source: PRISM, Oct 2015
Aromatics Outlook:
BZ Remains Strong Thanks to Shale Gas

Stable Demand Growth from Derivative Support BZ Market

BZ spreads are expected to be held at low levels

The benzene market is inherently unbalanced with inelastic supply, nonintegrated demand and growing deep sea trade.

2016 global operating rate will improved from 2015 operating rate due to demand growth outpace supply growth.

Lighter feedstock reduces benzene output.
Thank you

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