Energy Markets Outlook
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Keisuke SADAMORI
Director of Energy Markets and Security
IEA
Oil prices ease in March, but recover in early April

- Higher Middle East exports pressure, Yemen tension supports
Business as unusual...

- Supply has become more price-elastic
- Demand less so
Oil price drop slows supply growth

- Global capacity growth slows to annual 860 kb/d through 2020 from 1.8 mb/d in 2014
March non-OPEC supply rose on increased North America output, but growth is slowing.

- Non-OPEC production rose by 100 kb/d m-o-m in March, to 57.7 mb/d.
- Non-OPEC expected to grow by 630 y-o-y in 2015 vs 2014 growth of 2.1 mb/d
- Non-OPEC output expected to post first y-o-y decline in 4Q15 since 2Q11
Iraq dominates OPEC capacity growth

- Oil price collapse, ISIL challenge yet to cause substantial slowdown
- Growth estimated at 1.1 mb/d in 2014-2020 period
- Elevated risks
OPEC supply soars to 31 mb/d in March, up 890 kb/d from February

- Higher flows from Saudi Arabia, Iraq and Libya push output to highest in nearly two years
- Biggest month-on-month increase since June 2011
Survival of the fittest

- US production growth slows in 2015-17
- Oil price, sanctions see Russian output contracting by 560 kb/d by 2020
Lower oil prices get a mixed demand response

- Although many other factors come into play, lower oil prices generally dampen the demand outlook in net oil-exporters.
- Raise the outlook in net oil-imports.
Eastward pull unabated

Average global demand growth (kb/d)

<table>
<thead>
<tr>
<th>Period</th>
<th>Value</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-06</td>
<td>1352</td>
<td>1.7%</td>
</tr>
<tr>
<td>2006-14</td>
<td>853</td>
<td>1.0%</td>
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<tr>
<td>2014-20</td>
<td>1104</td>
<td>1.2%</td>
</tr>
</tbody>
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This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Oil trade tilts to products

Crude Exports in 2020 and Growth in 2014-20 for Key Trade Routes

(million barrels per day)

Red number in brackets denotes growth in period 2014-20

1 Excludes Intra-Regional Trade
2 Includes Chile
3 Includes Israel
Global recovery in demand gathers pace

- **+1.3 mb/d in 1Q15, to 93.0 mb/d**
  - Colder weather provided a particular impetus
  - Very strong gains seen in Korea & India
- **Growth of 1.1 mb/d foreseen in 2015 as a whole, to 93.6 mb/d**
  - Up sharply on 2014’s +0.7 mb/d gain
Refining surplus lingers despite scaling back

- New capacity of 6.4 mb/d by 2020, led by non-OECD Asia, Middle East
- Brief margin respite in 2014 on shutdowns
- Startups lift surplus to 5 mb/d in 2020 from 6-yr low ~3 mb/d in 2014
Global refinery crude demand fall seasonally through May

- Global refinery runs rose in February, despite US refinery maintenance
- Global crude demand to fall through May, as European, then Asian turnarounds commence.
  - Asia takes as much as 2.5 mb/d of capacity offline at peak in May
Recent inventory builds unbalanced widely skewed to crude and centered in the US and China

- S&D balances imply 140 mb stock build in 1Q15
- 90% of this can be identified from preliminary data:
  - OECD +50 mb
  - China +76 mb

*OPEC production assumed at 30 mb/d through forecast period
Despite lower oil prices biofuels continue to grow

- Biofuel production is mandate not price driven
Instability in the Middle East a major risk to oil markets

The short-term picture of a well-supplied market should not obscure future risks as demand rises to 104 mb/d & reliance grows on Iraq & the rest of the Middle East.
Ever-growing crude trade between Asia and the Middle East

North America’s oil imports fall as it becomes more self-sufficient, and Europe’s decrease with falling demand, 90% of Middle East crude exports go to Asia by 2040.
US shale gas: LTO associated gas might be hit, but benefits from lower drilling costs.
Asia LNG spot prices started to fall sharply well ahead of the drop in oil

- LNG prices were already falling well ahead of the drop in oil
- Cheap oil linked gas from the new Australian contracts will reduce demand for spot gas
Japan: persistent electricity demand weakness limits LNG needs

Japanese power generation

Twh

- Financial crisis
- Earthquake
- WEO 2010 projection
- 120 TWh

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Very high prices have had a major impact on Asian demand.

- Korean LNG demand has dropped significantly in 2014 due to the restart of nuclear capacity and switch to coal in the power sector.
- India and China underutilized their LNG infrastructure.
A wave of new LNG supply is coming

Additional LNG capacity (growth relative to the previous period, bcm)

- Others
- Australia

- 2013 H2
- 2014 H1
- 2014 H2
- 2015 H1
- 2015 H2
Large impact on Japanese energy costs

Japanese LNG import bill

- 2013
- 20GW nuclear restart but $100/bbl
- No nuclear restart but $50/bbl
Cheaper LNG enables faster electrification in India

India gas-fired capacity and load factors

- Gas-fired capacity end 2011 (GW)
- Gas-fired capacity end 2014 (GW)
- Load factor 2011
- Load factor 2014

~ 11MT of LNG
Gas reduces China’s coal dependency outside the power and steel sectors

Coal use in different sectors

USA shale gas production

- China
  - Power
  - Steel
  - Other

- USA + EU
  - Power
  - Steel
  - Other
Significant upside potential in EU power generation

Estimated potential upswing in power generation gas demand

- UK
- Germany
- Italy
- Spain
- Netherlands
- Rest of Europe
European gas prices might need to drop towards $5/mmbtu if gas-to-coal switching is the way to rebalance the market.

Note: Based on gas, coal, and carbon forward curves as of May 20 2015 – approximate switching price
Increasing examples of wind and solar PV costs comparable to new-build alternatives

Transition to new era of economic attractiveness for renewables where good resource and appropriate policy and regulatory framework are in place.
PV could provide 16% of global electricity by 2050 and 20% of CO2 emission cuts

Based on cautious cost assumptions and 8% WACC

Key factor will be flexibility of power systems to integrate large share of v-RE; STE will play a complementary role to PV