1. Short term market developments

*Economic risks and supply surprises*
Two year price recovery stalled since spring

*But prices remain high by historical standards*

- Crude prices have slipped from April highs
- Higher OPEC supply and weakening economy have eased some market concerns...
- ...though geopolitical issues provide price floor
- WTI regains lost ground on regional fundamentals, Libya/NSea recovery eurozone concerns
- But high prices already contributing to economic slowdown & oil burden near 2008 levels
Demand growth dipped into negative territory in 4Q12 for first time since 2009.

Global GDP growth assumed at 3.8% and 3.9% for 2011 and 2012, respectively.

Short-term economic risks lie to the downside.

Still, robust gasoil demand underpins product demand:
- Industrial strength still lingers, particularly in the US.
- Diesel use upside if there are further non-oil generation outages.
Demand-side risks skewed to the downside

- Consensus economic outlook scaled back since the spring
- Curbs 2011 demand growth to well below 2010, now 0.7 mb/d
- NB Japan nuclear offset boosts CODB and fuel oil
- 2012 outlook depends on GDP profile
- Difference between 3.9% & 2.6% GDP growth = 1.2 mb/d
- Income elastic non-OECD demand impact is greatest

### Global GDP Growth Assumption:

<table>
<thead>
<tr>
<th>Year</th>
<th>Y-o-Y, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>5.0</td>
</tr>
<tr>
<td>2011</td>
<td>3.8</td>
</tr>
<tr>
<td>2012</td>
<td>3.9</td>
</tr>
<tr>
<td>2013</td>
<td>4.0</td>
</tr>
<tr>
<td>2014</td>
<td>4.1</td>
</tr>
<tr>
<td>2015</td>
<td>4.2</td>
</tr>
<tr>
<td>2016</td>
<td>4.3</td>
</tr>
</tbody>
</table>

### Oil Demand Sensitivity

(million barrels per day)

<table>
<thead>
<tr>
<th>Year</th>
<th>Base GDP</th>
<th>Lower GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>2011</td>
<td>3.8%</td>
<td>2.6%</td>
</tr>
<tr>
<td>2012</td>
<td>3.9%</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>2011 vs. 2010</th>
<th>2012 vs. 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>mb/d</td>
<td>%</td>
</tr>
<tr>
<td>mb/d</td>
<td>mb/d</td>
<td></td>
</tr>
</tbody>
</table>

- **Base GDP**
  - Global GDP: 5.0% → 3.8% → 3.9%
  - OECD: 46.2 → 45.6 → 45.3
  - Non-OECD: 42.1 → 43.4 → 44.8
  - World: 88.3 → 89.0 → 90.0

- **Lower GDP**
  - Global GDP: 5.0% → 2.6%
  - OECD: 46.2 → 45.6 → 45.0
  - Non-OECD: 42.1 → 43.3 → 43.8
  - World: 88.3 → 88.8 → 88.8
One-off factors can have major impact

**Japan Turning Towards Thermal Power**

- Japan’s nuclear capacity likely to dip to low levels in early 2012 as more plants go offline for normal maintenance with uncertain restart times
- In the absence of policy changes, oil and LNG likely to make up most all of the shortfall
- Under scenario where nuclear power plants restart in 2012
  - Incremental crude + fuel oil burn for power generation needs would rise to 230 kb/d above normal in 2011; 270 kb/d above normal in 2012
  - By contrast, oil fired generation would normally consume about 200 kb/d
- Under worst case scenario of no nuclear restart
  - Incremental oil needs could rise to 460 kb/d versus normal nuclear profile

Source: IEA Oil Market Report
Demand puzzles to watch in coming months

- Slowing? But +400 kb/d
  - US Northeast: Households by Primary Heating Source, Winter Period
    - Natural gas
    - Heating oil

- Nuclear restart? Oil 0.2-0.4 mb/d
  - Japan: Oil Consumption (Crude + Fuel Oil) for Power Generation*
    - *Main Utilities; Source: FEPC, IEA

- Lower seasonality? +/-0.3 mb/d
  - China: Apparent Gasoil Demand
  - Oil Market Report

Source: EIA; 2011/2012 is EIA projection

*Main Utilities; Source: FEPC, IEA
2011 tells a story of supply disappointment...
...risk of more to come in 2012?

- Unplanned outages curb non-OPEC supply by 0.7 mb/d in 2H11
- Libyan supply loss cost the market 425 mb so far, while OPEC & IEA collective action compensated around 75%
- Libyan recovery could slow, and market is pricing in concerns on Iranian supply availability

### Estimated Jan-Sep 2011 Imports of Iranian Crude

<table>
<thead>
<tr>
<th>Country</th>
<th>kb/d</th>
<th>% Total 2011 Oil Demand</th>
<th>% Total Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>36</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>5</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>France</td>
<td>58</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Germany</td>
<td>15</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Greece</td>
<td>103</td>
<td>30%</td>
<td>4%</td>
</tr>
<tr>
<td>Italy</td>
<td>185</td>
<td>13%</td>
<td>7%</td>
</tr>
<tr>
<td>Japan</td>
<td>327</td>
<td>7%</td>
<td>13%</td>
</tr>
<tr>
<td>South Korea</td>
<td>228</td>
<td>10%</td>
<td>9%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>19</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Poland</td>
<td>3</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Spain</td>
<td>161</td>
<td>12%</td>
<td>6%</td>
</tr>
<tr>
<td>Turkey</td>
<td>196</td>
<td>29%</td>
<td>8%</td>
</tr>
<tr>
<td>UK</td>
<td>11</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>IEA Pacific</td>
<td>555</td>
<td>8%</td>
<td>22%</td>
</tr>
<tr>
<td>IEA Europe</td>
<td>792</td>
<td>7%</td>
<td>31%</td>
</tr>
<tr>
<td>IEA Total</td>
<td>1347</td>
<td>7%</td>
<td>53%</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>550</td>
<td>6%</td>
<td>22%</td>
</tr>
<tr>
<td>India</td>
<td>310</td>
<td>9%</td>
<td>12%</td>
</tr>
<tr>
<td>Other Asia</td>
<td>240</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>Non-OECD Asia</td>
<td>1100</td>
<td>5%</td>
<td>44%</td>
</tr>
<tr>
<td>Total Asia</td>
<td>1655</td>
<td>65%</td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>80</td>
<td>14%</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2527</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Source: IEA databases, Lloyds/Apex
Non-OPEC also suffers unscheduled 2011 outages

- Consistent shortfalls averaging 0.7 mb/d from non-OPEC in 2011, even without major hurricane outages
- Working assumption is that 2011 is an outlier...
- ...and that non-OPEC can potentially grow 1 mb/d in 2012

**Non-OPEC Supply 2011**

**Selected Shut-ins & Maintenance**

- **1Q**: -50, -130
- **2Q**: -140, -260
- **3Q**: -140, -320
- **4Q**: -40, -540

**Total Non-OPEC Supply, y-o-y chg**

**Selected Non-OPEC Supply Annual Changes (2011 & 2012)**

- 2011 Growth
- 2012 Growth
2012 supply uncertainties abound

- 2011 demonstrates again that non-OPEC potential supply faces downside risks
- Geopolitical risks throw market spotlight on spare production capacity
- IEA defines OPEC capacity as available in 30 days, sustainable 90, excl. surge
- Effective spare capacity acknowledges that short term capacity to boost supply may be constrained
2011 OPEC output recovers after Libya disruption

- OPEC December supply estimated +240 kb/d to 30.9 mb/d
- Monthly market assessments for OPEC supply based on a combination of JODI data, tanker tracking & other market intelligence, amid data and definitional issues
- Amid economic uncertainty, and weak non-OPEC performance, 2H11 OPEC supply, though increasing, seems to have lagged underlying demand
- 2012 ‘call on OPEC crude & stock change’ oscillates around 30 mb/d, some 0.5 mb/d less than in 2011
Physical market has tightened sharply since mid-2010 – more to come in 2012?

- Post-recession demand bounce drove tightening market in 2010
- 2011 tightness has derived from supply side factors
- This, & uncertain OPEC response post-Libya crisis, drove IEA LCA decision
- Increased consensus now over underlying 2012 ‘call’, and OPEC raises target to 30 mb/d

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Source: IEA Oil Market Report
Inventories: major gaps in data coverage

- OECD inventory data far from perfect – monthly revisions of +/- 10 mb not uncommon
- But at least there is regular, comprehensive, timely reporting
- This is missing for non-OECD, notably major growth markets like China and India
- Asian storage additions (strategic & comm) could add 400 kb/d to underlying crude & product demand in 2012-2016
2. Medium Term Oil Markets
   December 2011 update
Working assumptions: medium term outlook

- Price assumption based on prevailing futures strip
- Economic outlook arguably shifting towards ‘low case’
- ‘Low-Case’ sensitivity
  - GDP growth averages 3% per annum, 2011-16
    - Versus 4.4% in ‘Base-Case’
  - Global Demand up 0.8% (or 0.7 mb/d) per annum
    - Versus 1.2% (1.1 mb/d) ‘Base’
- Oil intensity declines by 2-3% annually
Creates two very different demand profiles

- Difference in 2016 oil demand between the two cases is 2.4 mb/d (92.6 mb/d vs 95 mb/d)
- But in both cases, non-OECD drives demand growth
- Exceeding 50% global market share by 2013
- Robust growth driven by rising incomes and assumption that price subsidies only removed gradually
Demand growth is all about non-OECD & transport


thousand barrels per day

<table>
<thead>
<tr>
<th>Period</th>
<th>Growth Rate</th>
<th>Thousand Barrels per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-2004</td>
<td>1.8%</td>
<td>1.43</td>
</tr>
<tr>
<td>2004-2010</td>
<td>1.0%</td>
<td>0.81</td>
</tr>
<tr>
<td>2010-2016</td>
<td>1.3%</td>
<td>1.21</td>
</tr>
</tbody>
</table>

OECD vs. Non-OECD Cumulative Oil Demand Growth by Use, 1997-2015

- OECD demand peaked in 2005
- Demand growth now focused in 3 regions: Asia, Mid.East & L.America
- Asia alone generates 55% of the total and China 35%
- Premium & subsidised markets sustain growth, despite high prices
- Understanding market trends requires better non-OECD data
Transport fuel use generates 65% of total oil growth, even though some will derive from biofuels and NGLs.

Oil has fewer short-to-medium term competitors in transport.

40% of growth, 30% of total demand by 2016 will be gasoil/diesel.

Engine efficiency, all-round flexibility, make gasoil ‘fuel of choice’.

Bunker sulphur quality changes and ever-present fuel switching possibilities add further lustre to gasoil’s rising star.

Bunker fuels rise from 4.3 mb/d to 5 mb/d, with residual fuel oil’s 75% share diminishing.
Non-OPEC growth focus is shifting

FSU provided main impetus for non-OPEC supply in the early part of the last decade

Baton now passed to the Americas – USA, Canada and Brazil

Source: IEA Oil Market Report
What’s changed since June?

US Light Tight Oil Raises Non-OPEC Supply Estimates

- Downward revisions in 2011-2013 due to unplanned outages, project delays, difficult investment climate in some MENA countries.
- Upward revisions due to uptick in E&P spending (rises by 22% in 2011, 10% in 2012), rosier N. American outlook.
- 2016 LTO revised up by 500 kb/d from June MTOGMR
- NGL supply revised up because producers are targeting liquids-rich tight oil plays.
Crude oil expansion plans in the medium-term are moving apace, with capacity now forecast to increase by 2.33 mb/d to 38.1 mb/d by 2016.

Capacity growth is 200 kb/d higher than our previous forecast for the 2010-16 period, with upward revisions to Iraq partially offset by delays to Iranian projects.

Iraq accounts for 80% of the increase, with capacity forecast to increase by a sharp 1.87 mb/d, to 4.36 mb/d on average by 2016, which is higher by 340 kb/d since our June report, largely due to steady progress at the country’s 12 JVs.

Source: IEA Oil Market Report
Profile of new global oil supplies is changing

- With OPEC NGLs also gaining +2.0 mb/d to 7.4 mb/d, ‘other supplies’ outstrip conventional crude in generating 2010-2016 supply growth
- Other supplies also eat into the share of demand growth that needs to be sourced from refining crude....
...Leaving refining (at least in OECD) under pressure

- Net refining capacity growth of 8.7 mb/d (all non-OECD) outstrips expected demand growth by 2 mb/d
- Suggests there is more OECD capacity closure or rationalisation to come
- The one bright spot will be middle distillates, with refiners positioned to produce clean diesel better able to resist intense competitive pressures
European refinery rationalisation gains pace

Closures amount to 1.35 mb/d since 2008
The medium term in summary

- Weaker demand baseline & stronger supply lead to easier market balances than in June 2011
- Spare capacity to increase from 2013 onwards in the base case
- Uncertainties persist – eurozone, global economy, China, subsidies, supply risks, boom & bust refining
- Supply growth struggles to exceed +1 mb/d annually, so outlook hinges critically on economic growth
- Demand migration to non-OECD, & shift to more difficult oil needs better data for better forecasts
Thank you for your attention