2010 – Energy Rebounds

Mark Finley, GM Global Energy Markets & US Economics
Outline

• Introduction
• Energy and the economy
• Fuel by fuel
• Conclusion
The economy and energy demand

GDP

Annual change, %

World
OECD
Non-OECD


Energy

Annual change, %

Renewables
Hydro
Nuclear
Coal
Gas
Oil

2006 2008 2010

10-year average

Source: includes data from Oxford Economics. GDP growth is expressed in real purchasing power parity (PPP) terms.
Recession and recovery

GDP and energy growth

Source: includes data from Oxford Economics.
Energy intensity

Energy intensity level

Change in energy intensity

Source: includes data from Oxford Economics.

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Crude oil prices

$/bbl

Dated Brent
Annual averages

12-month moving average volatility, %

Lowest since March 1995

Source: includes data from Platts.
### Oil consumption growth in 2010

<table>
<thead>
<tr>
<th>Largest changes</th>
<th>Regiona growth by fuel type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kb/d</strong></td>
<td><strong>Kb/d</strong></td>
</tr>
<tr>
<td>China</td>
<td>Asia Pacific</td>
</tr>
<tr>
<td>US</td>
<td>N. America</td>
</tr>
<tr>
<td>Russia</td>
<td>S&amp;C America</td>
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<tr>
<td>Brazil</td>
<td>Eur. &amp; Eurasia</td>
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<tr>
<td>Saudi Arabia</td>
<td>Middle East</td>
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<tr>
<td>Singapore</td>
<td>Africa</td>
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<tr>
<td>India</td>
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<tr>
<td>Canada</td>
<td></td>
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<tr>
<td>France</td>
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</tr>
</tbody>
</table>

**Bar Chart**

- **Gasoil**
- **Gasoline**
Oil production growth in 2010

Changes of more than 100 Kb/d.
Oil inventories

OECD commercial oil stocks

<table>
<thead>
<tr>
<th>Mbbls</th>
<th>05-09 Range</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>2900</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2800</td>
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<tr>
<td>2700</td>
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<td></td>
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<tr>
<td>2600</td>
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<tr>
<td>2500</td>
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</table>

Jan | Mar | May | Jul | Sep | Nov

Oil in floating storage

<table>
<thead>
<tr>
<th>Mbbls</th>
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</thead>
<tbody>
<tr>
<td>160</td>
</tr>
<tr>
<td>120</td>
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<tr>
<td>80</td>
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<tr>
<td>40</td>
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<tr>
<td>0</td>
</tr>
</tbody>
</table>

Jan-09 | Jul-09 | Jan-10 | Jul-10 | Jan-11

Source: includes data from Monthly Oil Data Services © OECD/International Energy Agency June 2011 and from EA Gibson.
Cumulative demand and production

Changes since 2005

Consumption

- OECD
- Non-OECD

Production

- OPEC Crude
- OPEC-11
- Biofuels
- OPEC NGLs
- Iran

Oil rig count and oil price

Index: Jan 2005 = 100

- OPEC
- Non-OPEC

Brent price

Source: includes data from Platts, Baker-Hughes.
Refining capacity and margins

Refining margins

$/bbl

BP RMM
10-yr. Av.

2005 2007 2009 2011 ytd

Refining capacity

Mb/d

OECD
Non-OECD

2005 2006 2007 2008 2009 2010

Source: includes data from Parpinelli-Technon, Platts.
Crude runs and light-heavy spreads

Crude runs and utilisation

Utilisation, %

$/bbl

Source: includes data from ESAI, Platts.
Natural gas markets

Consumption and production growth

2010 vs 2009, Bcm

<table>
<thead>
<tr>
<th>Region</th>
<th>Consumption</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
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<tr>
<td>Asia</td>
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<td>Mid East</td>
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<td>Europe</td>
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<td>FSU</td>
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<tr>
<td>N America</td>
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</table>

$/$Mmbtu

Source: includes data from Platts, BAFA.
US natural gas market

Horizontal gas and oil drilling

Number of horizontal rigs

Gas share in generation from coal and gas

Source: includes data from Smith Bits STATS, EIA.
Global natural gas trade

Global gas trade growth

Annual change, %

-10% 0% 10% 20% 30%

Piperline  LNG

2009  2010

LNG trade links

Four main importers, av. number of sources

All exporters, av. number of markets

Source: includes data from Cedigaz, GIIGNL, CISStat.
OECD Europe natural gas market

Prices

$/Mmbtu

Import growth

Annual change, %

Coal consumption and imports

Consumption changes

- RoW
- EU
- US
- India
- China

China’s imports

- RoW
- Indonesia
- Australia

Source: includes data from IHS CERA, IHS McCloskey.

*Spread between China’s Qinhuangdao and Australia’s Newcastle coal prices.
Hydro and nuclear power consumption

**Hydro**

Annual change, %

- 2000: -4%
- 2002: 2%
- 2004: 6%
- 2006: 0%
- 2008: 2%
- 2010: 4%

**Nuclear**

Annual change, %

- 2000: 6%
- 2002: 2%
- 2004: 8%
- 2006: 4%
- 2008: 0%
- 2010: 2%

10-year average
**CO₂ emissions**

**CO₂ emissions growth 2010**

**Contributions to growth**

- **6%**
  - China
- **4%**
  - Other non-OECD
- **2%**
  - Gas
- **0%**
  - OECD

**By region**

**By fuel**

**CO₂ intensity of energy**

**Tonnes of CO₂ per toe**

- **Non-OECD**
  - 2.9
- **World**
  - 2.8
- **OECD**
  - 2.6

**Years**

- 1990
- 1995
- 2000
- 2005
- 2010
Renewable energy

Share of primary energy

Renewables in power
Biofuels

Percent

2001 2004 2007 2010

Renewables growth

Contributions to growth

Renewables in power
Biofuels

2001 2004 2007 2010

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Renewables in power

Share of power generation

- World
- OECD
- Non-OECD

Share of power generation in 2010

<table>
<thead>
<tr>
<th>Country</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
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</thead>
<tbody>
<tr>
<td>Denmark</td>
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<td>Portugal</td>
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<td>New Zealand</td>
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<td>Philippines</td>
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<tr>
<td>Germany</td>
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</table>
Renewables in Germany and Spain

Germany

Share of primary energy, %

- Nuclear (1974-1983)
- Renewables (2001-2010)

Years after reaching 1% share

Source: includes data from MITyC.SEE.

Spain

Power generation, TWh

- Oil
- Gas
- Coal
- Solar
- Biomass
- Wind
- Hydro
- Nuclear

Renewable power growth

Growth by region

Contributions to growth

- **China**
- **Other non-OECD**
- **OECD**

Renewables consumption

Index: 2000=100

- Spain
- China
- Germany

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60 years of energy

Thank you