Energy Outlook 2030
Key trends and implications

Alexander Naumov, Macro Economist
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Global energy trends
Oil and gas 2012
Shale oil and gas: Implications
Contents

Global energy trends

Oil and gas 2012

Shale oil and gas: Implications
Population, income and energy growth

Population

GDP

Primary energy

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Industrialisation drives energy growth

By region

By primary use

By fuel

*Includes biofuels

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Emerging economies dominate energy production

Energy production by region

- Non-OECD
- OECD

Oil reserves

- Other
- North America
- FSU
- OPEC

Gas reserves

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Convergence of energy intensity and fuels shares

Energy intensity

Shares of world primary energy

Toe per thousand $2011 GDP (PPP)

*Euro4 (France, Italy, Germany, UK) pre-1970

*Includes biofuels

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Global energy trends

Oil and gas 2012

Shale oil and gas: Implications
Oil production in 2012

Largest changes

- 1.0
- 0.5
  0.0
  0.5
  1.0

Mb/d

Non-OPEC
OPEC
Norway
UK
Syria
Sudan
Iran

North Dakota production

Count

Wells started
Rig count
Production (RHS)

Kb/d

Jan-08
May-09
Sep-10
Jan-12

Source: Includes data from North Dakota Department of Mineral Resources

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The oil market

The price of oil

$/bbl

Supply disruptions

Annual loss, Mb/d

Source: Includes data from Platts and Energy Information Administration

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US coal to gas switching

Natural gas consumption growth

Power generation

Annual change, Bcm

10 year average  2012

Annual change, %

Average gas price (RHS)


$/mmBtu

Source: Includes data from Energy Information Administration and Platts

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European gas-coal competition

EU power generation cost

2012 changes in EU imports

Annual change, Mtoe

Source: Includes data from Platts, IHS McCloskey and IntercontinentalExchange

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Oil and gas 2012
Shale oil and gas: Implications
(1) Policy: tight oil and shale gas resources and production

Current resources

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<th>Oil</th>
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<td>Middle East</td>
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Production in 2030

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<th>Oil</th>
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Resources data © OECD/IEA 2012

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(2) Global oil markets: the call on OPEC

Unconventionals share of net global supply growth

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<th>2010-20</th>
<th>2020-30</th>
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<tr>
<td>Biofuels</td>
<td>25%</td>
<td>50%</td>
<td>75%</td>
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<tr>
<td>Oil sands</td>
<td>75%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>Tight oil</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Call on OPEC & spare capacity

- Spare capacity
- Call on OPEC (RHS)

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(3) Geopolitics and (4) economics: import profiles

**Energy imbalances**

- **China**
- **EU**
- **US**

**Energy imbalances to GDP ratio**

- **China**
- **US**
- **EU**

*Energy Outlook 2030*
Conclusion

GDP, Energy and CO₂ emissions

Largest emission changes in 2012

Index, 1970=100

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