How Energy Sector Integration and Technology Innovations are Impacting European Refining Markets?

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PKN ORLEN is the leading fuel group in Central and Eastern Europe…

Operational data for selected oil companies in Europe, 2012

<table>
<thead>
<tr>
<th></th>
<th>PKN ORLEN</th>
<th>OMV</th>
<th>MOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughput mln tons</td>
<td>28</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Sales mln tons</td>
<td>22,6</td>
<td>30,2</td>
<td>17,7</td>
</tr>
<tr>
<td>Utilization %</td>
<td>88</td>
<td>88</td>
<td>90</td>
</tr>
<tr>
<td>Fuel station</td>
<td>2,695</td>
<td>4,432</td>
<td>1,611</td>
</tr>
<tr>
<td>Employment thousand people</td>
<td>22,4</td>
<td>28,7</td>
<td>31,2</td>
</tr>
</tbody>
</table>

1 Data for selected companies: PKN Orlen (PKN ORLEN, ORLEN Lietva, Unipetrol); MOL (MOL, Slovnaft, INA, IES); OMV (OMV, Bayernoil, Petrom)
2 Refined products
Source: companies
…with high class assets deployed in Poland, Czech Republic and Lithuania

Refining assets of PKN ORLEN, 2012

- Refinery in Plock classified as a super-site (acc. to WoodMackenzie) considering the volume and depth of processing, integration with petrochemical operations
- Modernized refining assets in Lithuania and in Czech Republic
- Refining assets integrated with petrochemicals

Crude oil throughput, mln tons

<table>
<thead>
<tr>
<th>Poland</th>
<th>Czech Rep.</th>
<th>Lithuania</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,1</td>
<td>3,9</td>
<td>8,5</td>
</tr>
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</table>

Utilization, %

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<tr>
<td>93%</td>
<td>82%</td>
<td>84%</td>
</tr>
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</table>

Fuel market share, %

<table>
<thead>
<tr>
<th>PKN ORLEN</th>
<th>Others</th>
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<tr>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>33%</td>
<td>67%</td>
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Revenue, bn EUR

<table>
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<tr>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
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<tbody>
<tr>
<td>21</td>
<td>24</td>
<td>30</td>
</tr>
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</table>

Source: PKN ORLEN
Over the next years PKN ORLEN will further develop upstream and power segments

PKN ORLEN in 2008… … 2012… … 2017… … and 2022
We are witnessing an energy revolution that changes the world. It will also change Europe, whether we like it or not.

1. Headwinds for European refiners
2. Shale gas story – what is it about?
3. Impact on European refining
4. Conclusions
Headwinds for European refiners

- Supply push
- Arab Spring
- Oil demand decline & climate policy
- Oil demand growth
What makes exploration of unconventional gas and oil resources a game changer?

<table>
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<tr>
<th>Appearance of innovative technology</th>
<th>Supply push</th>
<th>Change in relative prices</th>
<th>New Map of International Competitiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Effect of deliberate activity</td>
<td>➢ Increase of output of gas and oil in the United States and Canada</td>
<td>➢ Interfuel (decline of gas price vis-à-vis other primary energy sources)</td>
<td>➢ Winners</td>
</tr>
<tr>
<td>➢ New resources of gas and oil elsewhere in the World</td>
<td></td>
<td>➢ Interregional (cheaper energy in the U.S. and Canada vis-à-vis Europe and Asia)</td>
<td>➢ Losers</td>
</tr>
</tbody>
</table>
LNG prices, May 2012 ($/MBtu)

Source: Waterborne Energy
Impact on European refiners: threat of substitution of oil with natural gas

Global Oil Demand By Sector in 2010, (mb/d)

Source: OPEC, Citi Research
The potential for use of natural gas in transport ~ one half of total demand for liquid fuels

Global demand for liquid fuels (oil and biofuels)

The crux is Diesel substitution by LNG
Long-term impact: Europe’s hesitation against shale gas and oil will lead to an increased dependence on Russia.
Shale gas revolution brought about a paradigm shift in global energy model. Europe hesitates to recognize it.

Global energy model

- Fossil fuels – raw materials – gift
- Depletion of resources – threat
- Oil and energy price - perpetual increase
- Competitive advantage – natural resources

- Innovative technology – product of activity
- Ample energy resources
- Plateau of oil and gas prices
- Innovation based comparative advantage

Globalization

Traditional

Integration

New

Energy = technology

New sources of energy = Innovative technologies

Innovative technologies = Commercial competitiveness = Lower cost of energy for the society

Source: PKN ORLEN
Price expectations underlying European climate policy design

A finite period of subsidy

renewables commercially viable

fossil fuels

price

t(0)  t(n)
time (t)
Fossil fuels supply shock has changed price expectations

(price, time)

- **Fossil fuels**
- **Renewables**

Infinite period of subsidy

\( t(0) \)
Europe needs a fundamental change in the paradigm of energy and climate policy

There is…

- Strive for **leadership** in **climate policy**
- Belief that **only renewable energy** will foster a **low-carbon economy**
- Priority of **environment protection** and **climate goals**
- Administrative selection of **technologies** of the future to be supported from the public purse

Should be…

- Strive for **leadership** in **economic competitiveness**
- **Low-carbon economy** is conducive to lowering emissions regardless of the source of energy
- Quest for a **cheap energy** supplied in a **safe way** for the public and the environment
- **Technology neutral** support of innovations
thank you

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