Energy Sector

Summer 2011

Elizabeth Hatch · Greg Zunkiewicz · Ben Goates
Outline

- Overview
- Business Analysis
- Economic Analysis
- Financial Analysis
- Valuation Analysis
- Final Recommendation
Current Weights

S&P 500 Weights
as of 7/31/2011

SIM Weights
as of 7/31/2011

Overview ➔ Business ➔ Economic ➔ Financial ➔ Valuation ➔ Conclusion
Energy Sector vs. S&P 500
Energy Sector vs. Other Sectors
Stocks in SIM Portfolio
1) Coal & Consumer Fuels
2) Oil & Gas Drilling
3) Oil & Gas Equipment / Svc
4) Oil & Gas Explor / Prod
5) Oil & Gas Integrated
6) Oil & Gas Refining / Mkting
7) Oil & Gas Storage
# Largest Companies

<table>
<thead>
<tr>
<th>Top Ten Companies</th>
<th>Market Cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exxon Mobil Corporation</td>
<td>394.7 B</td>
</tr>
<tr>
<td>PetroChina Company Limited</td>
<td>260.6 B</td>
</tr>
<tr>
<td>Royal Dutch Shell plc</td>
<td>228.2 B</td>
</tr>
<tr>
<td>Petroleo Brasileiro SA</td>
<td>222.8 B</td>
</tr>
<tr>
<td><strong>Chevron Corporation</strong></td>
<td><strong>211.55 B</strong></td>
</tr>
<tr>
<td>BP plc</td>
<td>142.47 B</td>
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<tr>
<td>Schlumberger Limited</td>
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</tr>
<tr>
<td>ConocoPhillips</td>
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</tr>
<tr>
<td>CNOO Limited</td>
<td>99.73 B</td>
</tr>
<tr>
<td>Ecopetrol S.A.</td>
<td>86.11 B</td>
</tr>
</tbody>
</table>

**Overview**

**Business**

**Economic**

**Financial**

**Valuation**

**Conclusion**
ANALYSIS OF DEMAND: MATURE PHASE OF LIFE CYCLE

- World Energy Outlook: predicts that world demand for oil (often used as a proxy for world demand for energy) will increase from 2,000 to 16,800 million tons of oil by 2030.

- About 93% of this increase in demand is expected to come from China and India.

- This demand will require spending $26.3 trillion by 2030.

- The majority of oil production in 2030 will come from fields that have not yet been discovered or developed.
Business Analysis

Figure 8. World Marketed Energy Consumption, 1980-2030

Quadrillion Btu

<table>
<thead>
<tr>
<th>Year</th>
<th>History</th>
<th>Projections</th>
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<tbody>
<tr>
<td>1980</td>
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<td>511</td>
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<tr>
<td>1985</td>
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<td>2004</td>
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<td>2020</td>
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<tr>
<td>2025</td>
<td></td>
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<tr>
<td>2030</td>
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ANALYSIS OF DEMAND: CYCLICAL BUSINESS CONDITION

- Clearly cyclical: profits see-saw with strength and weakness of U.S. economy.
- U.S. economy has (slowly!) entered an expansion; graph shows historical performance of energy in relation to stage of economy.
- Ability to monitor and compare the performance of energy sectors at various times helps us improve asset allocation decisions, and even predict future market moves.
ANALYSIS OF DEMAND: WHAT DOES THIS MEAN?

- Huge economic contraction and recession from late 2007 to early 2009, markets have rebounded tremendously.

- After nearly two years of historically record-breaking performance, many signs of potential trouble ahead are brewing.

- Our current position within the economic cycle may be approaching the end of the expansionary phase.

- Short term basis: a great time to up holdings.
ANALYSIS OF DEMAND: WHAT IS DRIVING THE INCREASE?

1) **Industrialization**, especially in emerging markets
   - Businesses (especially factories) require significant amounts of energy (both electricity and petroleum-based fuels) to operate.
   - As economies industrialize, energy demand increases.
Business Analysis
ANALYSIS OF DEMAND: WHAT IS DRIVING THE INCREASE?

- 2) Increasing wealth in these emerging markets, particularly India and China.

  - When economies grow, their energy needs grow.
  - Consumers (and growing businesses) want cars, air conditioners, refrigerators, and other high-draw items.
3) **Globalization!**

- Transportation is one of the largest consumers of energy in the world (58 percent of liquid fuel consumption).

- As we move more often, further, and with greater speed, the energy we use in transportation will inevitably increase.

- Air travel in particular is a heavy user of fuel.
4) Concerns over energy security

- Long-term concerns over energy security around the world have led to what some might consider an irrational premium paid for energy assets.

- This is most apparent in the very favorable deals struck by China with host governments in countries around the world to explore for oil & gas,

- One of the contributing factors to the increasing premium paid per barrel of proven oil reserves in the oil exploration and production industry.
ANALYSIS OF DEMAND: USER GEOGRAPHY

- World energy consumption in 2010: over 5% growth
  - Energy consumption in the G20 soared by more than 5% in 2010, after the slight decrease of 2009 (global financial crisis).
  - This strong increase is the result of two converging trends.
    - Industrialized countries, which experienced sharp decreases in energy demand in 2009, recovered firmly in 2010, almost coming back to historical trends. Oil, gas, coal, and electricity markets followed the same trend.
    - On the other hand, China and India, which showed no signs of slowing down in 2009, continued their intense demand for all forms of energy.
Business Analysis
Business Analysis
## Analysis of Demand: Input / Output Analysis

<table>
<thead>
<tr>
<th>Supply Sources</th>
<th>Percent of Source</th>
<th>Demand Sectors</th>
<th>Percent of Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum</td>
<td>71% Transportation 23% Industrial 5% Residential and Commercial 1% Electric Power</td>
<td>Transportation 27.8%</td>
<td>95% Petroleum 2% Natural Gas 3% Renewable Energy</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>3% Transportation 34% Industrial 34% Residential and Commercial 29% Electric Power</td>
<td>Industrial 20.6%</td>
<td>42% Petroleum 40% Natural Gas 9% Coal 10% Renewable Energy</td>
</tr>
<tr>
<td>Coal</td>
<td>8% Industrial &lt;1% Residential and Commercial 91% Electric Power</td>
<td>Residential and Commercial 10.8%</td>
<td>16% Petroleum 70% Natural Gas 1% Coal 1% Renewable Energy</td>
</tr>
<tr>
<td>Renewable Energy</td>
<td>11% Transportation 28% Industrial 10% Residential and Commercial 51% Electric Power</td>
<td>Electric Power 40.1%</td>
<td>1% Petroleum 17% Natural Gas 51% Coal 9% Renewable Energy 21% Nuclear Electric Power</td>
</tr>
<tr>
<td>Nuclear Electric Power</td>
<td>100% Electric Power</td>
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</tbody>
</table>

### Global Production vs. Consumption

### Overview

- Business
- Economic
- Financial
- Valuation
- Conclusion
Business Analysis

ANALYSIS OF SUPPLY

Yearbook of World Energy

Overview  →  Business  →  Economic  →  Financial  →  Valuation  →  Conclusion
Economics: Oil Price vs. Sector

Overview

Business

Economic

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Economics: Oil Price vs. Oil Rigs

BRENT CRUDE OIL SPOT PRICE and BAKER HUGHES RIG COUNT

Dollars per Barrel

Lag: 0 Months  r = .8/

Avg. # of Rigs 2500

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Economics: Oil Price vs. Gas Price

Overview

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Economics: Oil Price vs. Drinking
Economics: Energy vs. Production
Economics: Energy vs. Confidence

CONSUMER CONFIDENCE and ENERGY

Index
140

Lag: 0 Months  r = .25

SPENS
652

563.02

57.6

01 02 03 04 05 06 07 08 09 10 11

0 20 40 60 80 100 120

Overview ➔ Business ➔ Economic ➔ Financial ➔ Valuation ➔ Conclusion
Supply/Demand & Market Sentiment
  - Oil futures contracts

Political Uncertainty Leads to Higher Prices

Highly Correlated w/ Consumer Staples
Financial Analysis: Revenue

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Financial Analysis: Cash Flow
Financial Analysis: Net Profit Margin

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Business

Economic

Financial

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Conclusion
Financial Analysis: ROE

Absolute

Vs. S&P 500

Overview → Business → Economic → Financial → Valuation → Conclusion
## Net Profit Margin vs. S&P 500

<table>
<thead>
<tr>
<th>Industry</th>
<th>Net Profit Margin Median</th>
<th>Net Profit Margin Current</th>
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<tbody>
<tr>
<td>Coal and Consume fuel</td>
<td>1.1</td>
<td>.9</td>
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<tr>
<td>Oil and Gas Drilling</td>
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<td>1.1</td>
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<tr>
<td>Oil and Gas Equipment</td>
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<td>1.2</td>
</tr>
<tr>
<td>Oil and Gas Exploration/Production</td>
<td>2.5</td>
<td>2.1</td>
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<tr>
<td>Oil and Gas Integrated</td>
<td>.9</td>
<td>.8</td>
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<tr>
<td>Oil and Gas Refining and marketing</td>
<td>.2</td>
<td>.1</td>
</tr>
<tr>
<td>Oil and Gas Storage</td>
<td>1.5</td>
<td>1.4</td>
</tr>
</tbody>
</table>
Financial Summary

- Cash-intensive Sector
- Healthy Revenue & Returns
  - In certain industries
## Energy Sector vs. S&P 500

### Relative to S&P 500

<table>
<thead>
<tr>
<th>Metric</th>
<th>High</th>
<th>Low</th>
<th>Median</th>
<th>Current</th>
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<tr>
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<tr>
<td>Price/Book</td>
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<td>.7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Price/Cash Flow</td>
<td>.9</td>
<td>.6</td>
<td>.7</td>
<td>.9</td>
</tr>
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</table>

### Valuation

- **Trailing P/E**: The historical price-to-earnings ratio, reflecting past earnings.
- **Forward P/E**: The projected price-to-earnings ratio, giving an insight into future earnings.
- **Price/Sales**: The price-to-sales ratio, showing the valuation relative to sales.
- **Price/Book**: The price-to-book ratio, indicating the value relative to book value.
- **Price/Cash Flow**: The price-to-cash flow ratio, reflecting the market value in relation to cash flow.

### Graphical Representation

- **Median**
- **Current**
- **S&P 500**

### Sections

- **Overview**
- **Business**
- **Economic**
- **Financial**
- **Valuation**
- **Conclusion**
## Coal and Consume fuel vs. S&P 500

### Relative to S&P 500

<table>
<thead>
<tr>
<th></th>
<th>High</th>
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<td>Price/Book</td>
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<td>1.3</td>
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<tr>
<td>Price/Cash Flow</td>
<td>2.1</td>
<td>.5</td>
<td>1</td>
<td>1.1</td>
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</tbody>
</table>

### Business Overview

- **Trailing P/E**
  - Median: 1.5
  - Current: 1.8

- **Forward P/E**
  - Median: 0.99
  - Current: 0.8

- **Price/Sales**
  - Median: 1.2
  - Current: 1.6

- **Price/Book**
  - Median: 1.5
  - Current: 1.3

- **Price/Cash Flow**
  - Median: 1
  - Current: 1.1
### Relative to S&P 500

<table>
<thead>
<tr>
<th>Metric</th>
<th>High</th>
<th>Low</th>
<th>Median</th>
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<tbody>
<tr>
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<td>.98</td>
<td><strong>1.1</strong></td>
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<tr>
<td>Price/Sales</td>
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<tr>
<td>Price/Book</td>
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<td>.4</td>
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<tr>
<td>Price/Cash Flow</td>
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<td>.4</td>
<td>1.1</td>
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</table>

### Diagram

- Median
- Current
- S&P 500

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**Overview** → **Business** → **Economic** → **Financial** → **Valuation** → **Conclusion**
### Oil and Gas Equipment vs. S&P 500

#### Relative to S&P 500

<table>
<thead>
<tr>
<th>Metric</th>
<th>High</th>
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<th>Current</th>
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#### Valuation

- **Median**
- **Current**
- **S&P 500**

---

**Overview** ➔ **Business** ➔ **Economic** ➔ **Financial** ➔ **Valuation** ➔ **Conclusion**
## Oil and Gas Exploration/Production vs. S&P 500

### Relative to S&P 500

<table>
<thead>
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<th>High</th>
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<th>Median</th>
<th>Current</th>
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</thead>
<tbody>
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### Overview

- **Business**
- **Economic**
- **Financial**
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- **Conclusion**
## Relative to S&P 500

<table>
<thead>
<tr>
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<th>Low</th>
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### Diagram

- **Median**
- **Current**
- **S&P 500**

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- Conclusion
## Oil and Gas Refining and marketing vs. S&P 500

### Relative to S&P 500

<table>
<thead>
<tr>
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<tr>
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**Overview**
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- Conclusion
The sectors financial ratios are running in line with the S&P 500 and their medians. Within the energy sector were only in the oil industry which is doing well based on their financial ratios. Most are in line or beating the S&P 500 as well as their medians. We are heavily weighted in the Oil and Gas Exploration which both the P/E trailing and P/E forward are beating the S&P 500 and their medians. Based on the valuation analysis the sector is performing well.
Increase SIM Weight
- By 1.50 bps (to -1.14)
  - Capture value on short-term instabilities

Re-position within the Sector
- Divest of low-performing industry segments