

## Economic Spotlight

### Energy and the Alberta Economy

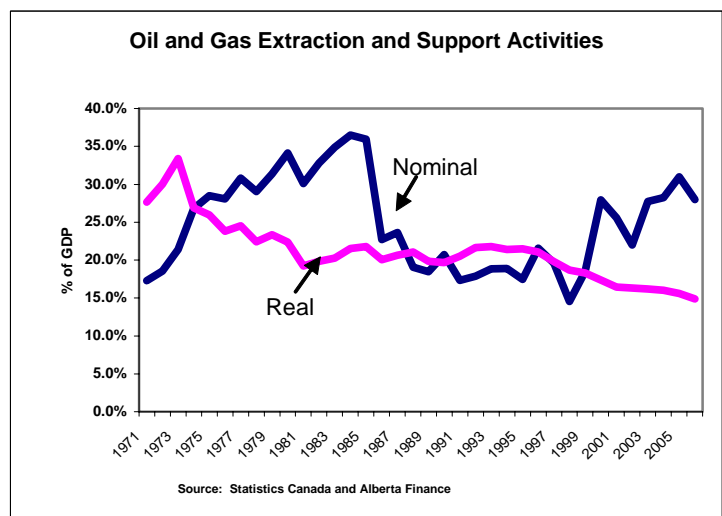
Although oil and gas industry is clearly a key industry for Alberta, estimates of its importance vary widely. Analysts have attributed anywhere from 20% to 50% of the economy to the oil and gas industry, depending on which industries are included and whether indirect impacts on the economy are taken into account.

- According to narrowest definition – oil and gas extraction and related support activities – the oil and gas sector accounted for 14.9% of Alberta’s real GDP in 2006; in nominal terms, however, the narrow definition of the oil and gas sector accounted for an estimated 28% of GDP.
- A broader definition of the oil and gas sector that includes relevant portions of the transportation, manufacturing and construction industries raises the share of the oil and gas sector to 24.5% of real GDP in 2006, and to about a third of nominal GDP in 2003, the latest year for which data are available.
- An input-output model can be used to estimate the indirect impact of the oil and gas sector on other Alberta industries. According to the input-output model, the direct and indirect impacts of the gross output of the broad oil and gas sector account for about half the Alberta economy. This, however, involves some double-counting of related industries.

### Oil and Gas Extraction

Although oil and gas extraction is a driving force behind Alberta’s economic growth, its importance has declined over time. The direct share of the energy sector (oil and gas extraction and related support services) has declined from its peak of one-third in 1973 to 14.9% in 2006.

In nominal terms, however, the share of the oil and gas sector has fluctuated widely with changes in energy prices. It peaked at around 36% in the mid-1980s and then fell to under 15% in



1998. With the recent rapid run-up in energy prices, the industry's share of nominal GDP has risen to around 28%.

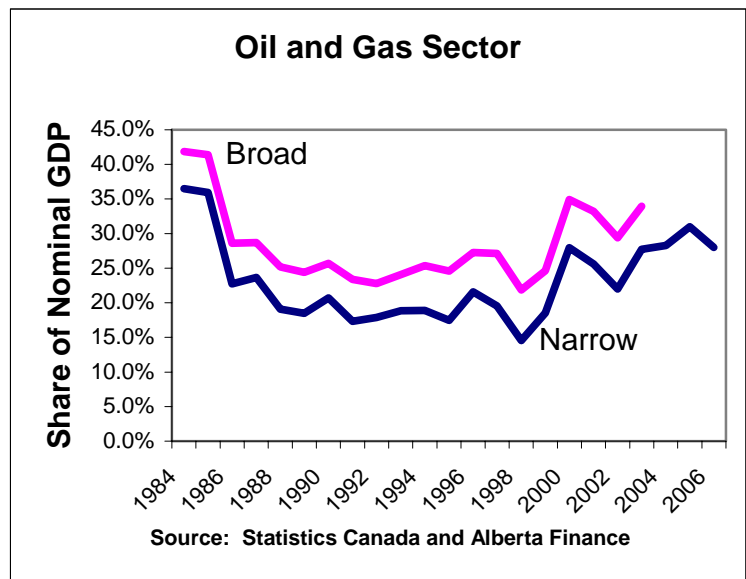
### The Broad Oil and Gas Sector

Many analysts have argued that the oil and gas sector is much broader in scope, that it should include activities related to the oil and gas sector beyond simple extraction. A broader definition includes the following sub-industries:

- Oil and Gas Extraction
- Support Activities for Mining and Oil and Gas Extraction
- Oil and Gas Engineering Construction
- Petroleum and Coal Products Manufacturing
- Chemical Manufacturing
- Mining and Oil and Gas Field Machinery Manufacturing
- Natural Gas Distribution
- Pipeline Transportation of Natural Gas
- Crude Oil and Other Pipeline Transportation

These detailed data for nominal GDP are only available for 1984 to 2003. Data on real GDP by detailed industry group are available from 1997 to 2006.

Note that there is some judgment in choosing which industries should be included in the broader sector. Chemical manufacturing, natural gas distribution and petroleum refining, for example, also occur in provinces like Ontario which are not energy producers. Within chemical manufacturing, only 14% was due to petrochemicals.



Variations in the contribution of the broad oil and gas sector to nominal GDP are dominated by variations in the value of oil and gas extraction. The broader definition increases the contribution of the oil and gas sector to nominal GDP by 5 to 7 percentage points. In 2003, the broad sector accounted for 34% of Alberta's nominal GDP and 24.5% of Alberta's real GDP.

### **Indirect Contribution**

In addition to its direct contribution, the oil and gas sector has indirect impacts as it spurs demand for goods and services in other sectors of the Alberta economy. However, these indirect impacts are hard to quantify and are usually estimated using input-output models. Although an input-output analysis is well accepted for an incremental change in an industry's output, it is not valid for gross output for an entire industry. For example, an input-output analysis for the broad energy industry in Alberta showed that the energy sector accounted for 50% of total Alberta economy in 2003. However, if we do the same exercise for all industries, Alberta's output was \$259 billion, or 58%, higher than the actual GDP.

The attached tables provide data for Alberta GDP and sub-components of oil and gas in both real and nominal dollars.

**Table 1**

| <b>Real GDP by Industry</b>                              | 1997          | 1998          | 1999          | 2000          | 2001          | 2002          | 2003          | 2004          | 2005          | 2006          |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Millions of Chained 1997 dollars</b>                  |               |               |               |               |               |               |               |               |               |               |
| <b>Narrow Definition</b>                                 |               |               |               |               |               |               |               |               |               |               |
| Oil and Gas Extraction                                   | 17,433        | 17,306        | 17,854        | 17,115        | 15,987        | 16,369        | 16,554        | 17,140        | 17,031        | 17,619        |
| Support Activities for Mining and Oil and Gas Extraction | 2,752         | 2,649         | 2,086         | 3,035         | 3,450         | 3,258         | 3,570         | 3,736         | 4,254         | 4,080         |
| <b>Total</b>   | <b>20,185</b> | <b>19,955</b> | <b>19,940</b> | <b>20,150</b> | <b>19,438</b> | <b>19,626</b> | <b>20,124</b> | <b>20,876</b> | <b>21,285</b> | <b>21,699</b> |
| <b>% of Total Industry</b>                               | <b>19.8%</b>  | <b>18.7%</b>  | <b>18.3%</b>  | <b>17.4%</b>  | <b>16.4%</b>  | <b>16.3%</b>  | <b>16.2%</b>  | <b>16.0%</b>  | <b>15.6%</b>  | <b>14.9%</b>  |
| <b>Broad Definition</b>                                  |               |               |               |               |               |               |               |               |               |               |
| Oil and Gas Engineering Construction                     | *             | *             | *             | *             | *             | 3,692         | 3,977         | 4,475         | 5,481         | 6,438         |
| Petroleum and Coal Products Manufacturing                | 263           | 279           | 279           | 285           | 274           | 288           | 270           | 242           | 246           | 243           |
| Chemical Manufacturing                                   | 2,943         | 2,981         | 2,988         | 3,191         | 2,350         | 2,501         | 2,588         | 2,986         | 3,029         | 3,386         |
| of which petrochemicals                                  | 484           | 489           | 400           | 518           | 524           | 598           | 392           | 423           | 447           | 473           |
| Mining and Oil and Gas Field Machinery Manufacturing     | *             | *             | *             | *             | *             | 584           | 596           | 824           | 1,036         | 1,287         |
| Natural Gas Distribution                                 | 491           | 510           | 558           | 576           | 511           | 520           | 553           | 550           | 521           | 536           |
| Pipeline Transportation of Natural Gas                   | 1,112         | 1,151         | 1,191         | 1,178         | 1,328         | *             | *             | *             | *             | 1,443         |
| Crude Oil and Other Pipeline Transportation              | 377           | 373           | 385           | 439           | 448           | *             | *             | *             | *             | 586           |
| <b>Total</b>   | <b>29,059</b> | <b>28,724</b> | <b>28,460</b> | <b>30,116</b> | <b>29,270</b> | <b>29,019</b> | <b>29,970</b> | <b>31,859</b> | <b>33,568</b> | <b>35,615</b> |
| <b>% of Total Industry</b>                               | <b>28.5%</b>  | <b>26.9%</b>  | <b>26.1%</b>  | <b>26.0%</b>  | <b>24.7%</b>  | <b>24.1%</b>  | <b>24.1%</b>  | <b>24.5%</b>  | <b>24.6%</b>  | <b>24.5%</b>  |

\* Confidential data estimated by Finance are included in total share

\*\*Estimates prepared by Alberta Finance

Source: Statistics Canada and Alberta Finance

**Table 2**

| <b>Nominal GDP by Industry</b>                           | 1997              | 1998          | 1999          | 2000          | 2001          | 2002          | 2003          | 2004**        | 2005**        | 2006**        |
|--|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|  | <b>\$ million</b> |               |               |               |               |               |               |               |               |               |
| <b>Narrow Definition</b>                                 |                   |               |               |               |               |               |               |               |               |               |
| Oil and Gas Extraction                                   | 17,433            | 12,421        | 18,327        | 36,078        | 34,894        | 28,610        | 41,307        | 46,155        | 59,809        | 58,838        |
| Support Activities for Mining and Oil and Gas Extraction | 2,752             | 2,631         | 2,162         | 3,081         | 2,786         | 3,602         | 4,063         | 4,811         | 6,180         | 6,052         |
| <b>Total</b>   | <b>20,185</b>     | <b>15,052</b> | <b>20,489</b> | <b>39,159</b> | <b>37,681</b> | <b>32,212</b> | <b>45,369</b> | <b>50,966</b> | <b>65,989</b> | <b>64,890</b> |
| <b>% of Total Industry</b>                               | <b>19.8%</b>      | <b>14.7%</b>  | <b>18.4%</b>  | <b>28.2%</b>  | <b>25.4%</b>  | <b>22.3%</b>  | <b>27.7%</b>  | <b>28.3%</b>  | <b>31.0%</b>  | <b>28.0%</b>  |
| <b>Broad Definition</b>                                  |                   |               |               |               |               |               |               |               |               |               |
| Oil and Gas Engineering Construction                     | *                 | *             | *             | *             | *             | 4,536         | 5,130         |               |               |               |
| Petroleum and Coal Products Manufacturing                | 263               | 280           | 217           | 818           | 949           | 754           | 493           |               |               |               |
| Chemical Manufacturing                                   | 1,522             | 1,285         | 1,119         | 1,516         | 1,526         | 1,443         | 1,291         |               |               |               |
| of which Petrochemicals                                  | 484               | 527           | 444           | 622           | 828           | 846           | 496           |               |               |               |
| Mining and Oil and Gas Field Machinery Manufacturing     | *                 | *             | *             | *             | *             | 591.9         | 573.1         |               |               |               |
| Natural Gas Distribution                                 | 491               | 508           | 542           | 516           | 594           | 724           | 603           |               |               |               |
| Pipeline Transportation of Natural Gas                   | 1,112             | 1,157         | 1,238         | 1,228         | 1,446         | *             | *             |               |               |               |
| Crude Oil and Other Pipeline Transportation              | 377               | 401           | 497           | 592           | 641           | *             | *             |               |               |               |
| <b>Total: Broad Oil and Gas</b>                          | <b>27,638</b>     | <b>22,323</b> | <b>27,522</b> | <b>48,575</b> | <b>48,417</b> | <b>42,359</b> | <b>55,656</b> |               |               |               |
| <b>Broad Oil and Gas as Share of Total*</b>              | <b>27.1%</b>      | <b>21.9%</b>  | <b>24.7%</b>  | <b>34.9%</b>  | <b>32.6%</b>  | <b>29.4%</b>  | <b>34.0%</b>  |               |               |               |

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