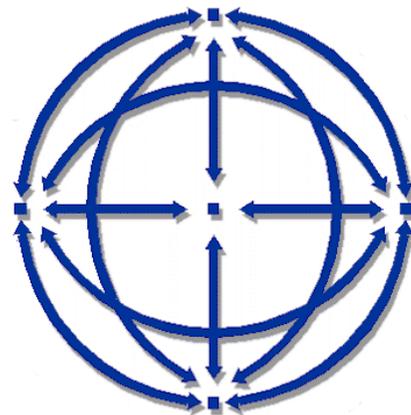


## Latest Developments in the Canadian Economic Accounts

### Revisions to trade data for crude oil and natural gas



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- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0<sup>s</sup> value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- <sup>P</sup> preliminary
- <sup>r</sup> revised
- X suppressed to meet the confidentiality requirements of the *Statistics Act*
- <sup>E</sup> use with caution
- F too unreliable to be published
- \* significantly different from reference category ( $p < 0.05$ )

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# Revisions to trade data for crude oil and natural gas

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## Background

Overall, the energy trade numbers released by Statistics Canada correspond to similar statistics collected by various other sources, including those of the National Energy Board, the United States Energy Information Administration and the United States Department of Energy.

International merchandise trade data may be revised following their initial publication. More recently, there has been a tendency towards more sizeable revisions to energy products, particularly those transported by pipeline. For energy transactions in general, much of the customs data is adjusted using information collected by Statistics Canada surveys of pipelines and refineries, as well as administrative data from the National Energy Board (NEB) and other government agencies. The purpose of the adjustments is to align the trade data with data collected elsewhere by Statistics Canada on the production and sales of Canadian crude oil and natural gas.

Following a reciprocal agreement signed with the United States Census Bureau, Statistics Canada has, since March 2013, been releasing international merchandise trade data approximately 35 days after the close of the reference month. Prior to March 2013, trade data were released approximately 41 days after the close of the reference month. To meet this shortened deadline, Statistics Canada often must estimate the reference month's values for energy trade using partial data sources that are available at the time of the release, knowing that Statistics Canada and NEB data will only become available after the first vintage of international merchandise trade data has been released. Though customs data for most commodities are usually available in time for release, the full set of information for crude oil and natural gas are not yet complete because of delayed reporting by customs brokers of energy pipeline transactions. This has led to a pattern of somewhat larger revisions to energy imports and exports than what is observed for other commodities.

## Methodology

The following outlines how energy estimates are produced and revised in subsequent releases of trade data on a balance-of-payment basis. Data are seasonally adjusted where appropriate.

## Crude oil

Estimates of the values of crude oil trade are derived from separate estimates of crude oil volumes and prices.

For exports, the process is explained next, using May as the reference month.

The volume and price of crude oil exports for the reference month (May) are each estimated statistically based on historical volumes and any available preliminary information; on current and past prices for various types of crude oil, posted on North American exchanges; and past prices for heavy and light crude oil released by the NEB. This represents the first vintage of data which, using our example of a May reference month, would be released in July (or  $M$ ). In the month that follows, i.e., month  $M+1$  or August, the estimated volume for the same reference month (May) is replaced with preliminary pipeline and refinery receipt data collected by Statistics Canada; an estimate of non-pipeline volumes; and provincial administrative data. The price for the second vintage (release month  $M+1$ , or August) is calculated using prices for heavy and light crude oil collected by the NEB. In the third vintage (month  $M+2$ , or September), the preliminary pipeline and refinery volumes for the reference month (May) are replaced by final volumes, and the non-pipeline volume estimates are replaced by NEB non-pipeline volumes. The source data for the price of crude exports used in the third vintage ( $M+2$ , or September) remains the same as for the second vintage ( $M+1$ , or August), although the NEB may make its own revisions to the price (and quantity) data it collects.

Table 1 below illustrates the timing of the revisions from the initial release in  $M$  all the way to  $M+2$ . There may be subsequent, smaller revisions due to seasonal adjustment or corrections to misclassified merchandise trade transactions.

Table 2 below provides an example of how Statistics Canada data on crude oil exports to the United States for May 2014, first released in July, are subsequently revised. The column "Value" is the product of the price and quantity for each release, whereas the column "Revision to value of previous release" gives the revisions to the value of the previous month's data. For example, the revision given in the row "August release" would be the first revision to the May data, which was initially published in the July release. The revision in the next row would be the revision to May data published in the August release. Here, the initial revision (first published in the August release) to the May 2014 exports of crude oil (first published in the July release), was an increase of \$773 million. In the September release, the May 2014 data, published in August, were revised downward by \$100 million.

For crude oil imports, the process is different. Both the volume and the price in month  $M$  are calculated using customs data for the reference month collected by the Canadian Border Services Agency (CBSA). The volume and price usually are carried into month  $M+1$ . In month  $M+2$ , the volume data for  $M+1$  are replaced with data collected by Statistics Canada on refinery receipts, while the price remains the same as in month  $M+1$ . Prices may be revised from month to month, as late reports are received from importers or misclassification errors in customs declarations are corrected.

## Natural gas

Values for natural gas trade are similarly decomposed into volumes and prices. In month  $M$ , the export volume is the preliminary number from Statistics Canada's pipeline survey, while the export price is estimated statistically using current and past prices posted on North American exchanges, and past prices published by the NEB, and, in the future, may use data on weather and storage. In month  $M+1$ , the preliminary volume is replaced by the final pipeline numbers from Statistics Canada and the NEB, while the estimated price from month  $M$  is replaced with the NEB price. The volume and price from month  $M+1$  are carried forward into month  $M+2$ .

For natural gas imports, both the volume and price are based on customs data collected by the CBSA and are carried forward to all subsequent months.

## Looking ahead

Statistics Canada regularly undertakes the analysis of its revisions. It uses this work to drive its research agenda with a focus on improving its models and initial indicators. The end goal is to reduce the size of the revisions between the initial estimates and subsequent releases for the same reference period.



## Table 1 Timing of revisions to crude oil exports, May reference month

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<b>Vintage</b>	<b>Volume</b>	<b>Price</b>
First vintage (May data released in July)	Statistics Canada preliminary estimate	Statistics Canada preliminary estimate
Second vintage (May data released in August)	Statistics Canada preliminary pipeline and refinery data, and estimate of non-pipeline data; provincial administrative data	Calculation based on estimates of National Energy Board prices
Third vintage (May data released in September)	Statistics Canada final pipeline and refinery data, and National Energy Board non-pipeline data	Calculation based on National Energy Board prices

**Source:** Statistics Canada



## Table 2

### Revisions to data on crude oil exports to the United States, May 2014 reference month

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Release	Volume	Price	Value	Revision to value of previous release
	thousands of cubic meters	dollars per thousand cubic meters		thousands of dollars
July release	12,580,000	604.00	7,598,320	
August release	13,571,400	616.81	8,370,990	772,670
September release	13,419,700	616.81	8,270,696	-100,294

Source: Statistics Canada



## Table 3 Timing of revisions to crude oil imports, May reference month

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<b>Vintage</b>	<b>Volume</b>	<b>Price</b>
First vintage (May data released in July)	Based on Canadian Border Services Agency (CBSA) customs	Based on Canadian Border Services Agency customs
Second vintage (May data released in August)	Based on Canadian Border Services Agency customs	Based on Canadian Border Services Agency customs
Third vintage (May data released in September)	Statistics Canada final refinery data	Based on Canadian Border Services Agency customs

**Source:** Statistics Canada



## Table 4 Timing of revisions to natural gas exports, May reference month

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<b>Vintage</b>	<b>Volume</b>	<b>Price</b>
First vintage (May data released in July)	Statistics Canada preliminary pipeline data	Statistics Canada statistical estimate
Second vintage (May data released in August)	Statistics Canada and National Energy Board final pipeline data	National Energy Board published price
Third vintage (May data released in September)	Statistics Canada and National Energy Board final pipeline data	National Energy Board published price

**Source:** Statistics Canada



## Table 5 Timing of revisions to natural gas imports, May reference month

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<b>Vintage</b>	<b>Volume</b>	<b>Price</b>
First vintage (May data released in July)	Based on Canadian Border Services Agency customs	Based on Canadian Border Services Agency customs
Second vintage (May data released in August)	Based on Canadian Border Services Agency customs	Based on Canadian Border Services Agency customs
Third vintage (May data released in September)	Based on Canadian Border Services Agency customs	Based on Canadian Border Services Agency customs

**Source:** Statistics Canada