

Bad data problem worsens as oil prices skyrocket

As oil prices have climbed to 10-year highs, the global market's need for timely, accurate production data is greater than ever. Yet, the quality and quantity of output statistics are worse than ever—the “missing barrels” phenomenon is alive and well

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Anxiety over predictions of Y2K problems in computer systems worldwide led millions of consumers to greet year 2000 with full gasoline tanks in their automobiles. Reported deliveries and inventories were affected in both 1999 and 2000. Meanwhile, none of the other problems with published statistics have been resolved. The “missing barrels” are still missing, and there are more of them.

Largely by default, the monthly *Oil Market Report (OMR)* compiled by the International Energy Agency (IEA) has become the source of published oil balances—not only for the financial community but also for the industry, itself. IEA is also a statistical agency. Based on the data available, recent oil balances—particularly stock movements—have differed considerably with the *OMR* version, as shown in Table 1.

After running slightly high in 1997 and 1998, IEA's estimate of global oil supply was about 600,000 bpd too low last year. Apparently sensing that it was underreporting supply,

IEA seems to have overcompensated this year, with the *OMR* estimate now running too high again.

The discrepancies in stock movements are even more pronounced. While estimates at Groppe, Long & Littell (GL&L) showed only 300,000 and 500,000 bopd were added to global stocks in 1997 and 1998, respectively, *OMR* reported increases that were 1.4 million and 1.5 million *higher*. Then, almost inexplicably, *OMR* data reversed course and *underreported* net stock declines in 1999 by 200,000 bopd. IEA's inconsistency is alive and well this year, as the agency is 900,000 bopd off of GL&L's estimate. *OMR* data are showing stocks as building, rather than continuing last year's decline.

THE Y2K EFFECT

A large number of apprehensive consumers took pains to begin year 2000 with full fuel tanks in their cars, trucks, houses, etc. Normally consumers' tanks are a little more than half-full. Oil statistics are collected from producers, refiners and marketers. The Y2K effect in 1999 mani-

Table 1. World oil balances, million bpd

	1997	1998	1999	1st qtr, 2000
IEA Oil Market Report				
Demand	72.7	73.5	74.7	75.0
Supply				
OPEC	29.9	30.8	29.4	29.3
Non-OPEC	42.9	43.1	42.9	44.2
Processing gain	1.6	1.6	1.7	1.7
Supply	74.4	75.5	74.0	75.2
Stocks up (or down)				
OECD	0.3	0.3	-0.7	-0.3
Other	1.4	1.7	...	0.5
Total	1.7	2	-0.7	0.2
Actual*				
Deliveries	74	74.8	75.1	77.1
Y2K Effect	...	...	0.4	-1.5
Supply				
OPEC	29.3	30.1	29.3	28.8
Non-OPEC	42.2	42.3	42.4	43.2
Processing gain	2.8	2.9	2.9	2.9
Supply	74.3	75.3	74.6	74.9
Stocks up (or down)				
OECD	0.3	0.3	-0.7	-0.3
Other	...	0.2	-0.2	-0.4
Total	0.3	0.5	-0.9	-0.7

*Calculated by Groppe, Long & Littell

Table 2. The Y2K effect, million bpd*

	4th qtr, 1999	1st qtr, 2000
United States	0.37	-0.38
Canada	0.04	-0.04
Mexico	0.02	-0.02
Western Europe	0.29	-0.29
Eastern Europe	0.08	-0.08
OECD Pacific	0.2	-0.2
Rest of World	0.48	-0.49
Y2K effect	1.48	-1.5
Adjusted deliveries	72.24	74.2
Reported deliveries	73.72	72.7
Million bbl		
Y2K effect	136	-136

*Calculated by Groppe, Long & Littell

Table 3. Example, full-year Y2K, million bpd*

	1999	2000	Change
Consumption	75.1	75.9	0.8
Y2K Effect	0.4	-0.4	
Deliveries	75.5	75.5	None

*Calculated by Groppe, Long & Littell

The large balancing items in OMR stocks are often called the “missing barrels.” They are, in concept, increases in stocks in parts of the world not covered by the statistical system.

fested itself as a large reduction in industry stocks at the end of the year. In addition, abnormally high reported deliveries were reported for the fourth quarter. In 2000, the Y2K effect has been the reverse—low reported deliveries and not much inventory drawdown in the first quarter, as shown in Table 2.

If it turns out that consumption of products increases by 800,000 bpd in 2000, versus 1999, then the Y2K effect will make reported deliveries about the same for both years. An example can be seen in Table 3.

THE MISSING BARRELS

The large balancing items in *OMR* stocks—1.4 million bopd in 1997 and 1.7 million bopd in 1998 for a total of 1.13 billion bbl—are often called the “missing barrels.” They are, in concept, increases in stocks in parts of the world not covered by the statistical system. Changes in stocks in the member-nations of the Organization for Economic Cooperation and Development (OECD) are usually small numbers over the course of a year. The Y2K effect was, of course, an extremely unusual event.

In 1999, *OMR* reported no missing barrels. However, in first-quarter 2000, another 500,000 bopd have turned up missing. That phenomenon can be explained by the figures in Table 4. Analysis shows that *OMR* should have reduced its figures for production and deliveries, and increased estimates of processing gains.

BASIC CONCEPTS

Before continuing a critique of IEA’s methods in *OMR*, a quick review of certain market definitions and fundamentals is in order. For instance, the production of oil has three categories:

- **Crude oil** is a mixture of hydrocarbons that exists in liquid phase at reservoir conditions of temperature and pressure
- **Condensate** consists of hydrocarbons that are in a gaseous state at reservoir conditions, but they condense to the liquid state at standard surface conditions
- **Natural gas liquids (NGLs)**—Ethane, propane, butanes and natural gasoline are components of natural gas, along with methane, its primary component. They are separated from the methane in processing plants using various technologies.

Refineries convert crude oil, condensate and NGLs into useful products, such as gasoline, naphtha, jet fuel, diesel, residual fuel oil, lubricants, wax, asphalt, coke,

Table 6. Estimates of 1999 production, million bopd

	<i>OMR</i>	EIA	<i>O&GJ</i>	BP
Algeria	0.76	0.772	0.757	1.340
Indonesia	1.27	1.324	1.277	1.445
Iran	3.50	3.522	3.511	3.550
Iraq	2.52	2.503	2.523	2.580
Kuwait	1.63	1.898	1.868	2.025
Libya	1.38	1.319	1.347	1.425
Neutral Zone	0.59	...	...	...
Nigeria	1.95	2.020	1.965	2.030
Qatar	0.63	0.659	0.633	0.715
Saudi Arabia	7.52	7.833	7.738	8.595
United Arab Emirates	2.07	2.089	2.060	2.505
Venezuela	2.79	2.786	2.784	3.125
OPEC Crude	26.61	26.725	26.463	29.335
OPEC Gas Liquids	2.83	2.533	...	...
Total OPEC	29.44	29.258	...	...
United States	8.10	5.881	5.938	7.760
Canada	2.56	1.907	1.889	2.595
Mexico	3.35	2.906	2.94	3.345
Western Europe	6.76	...	6.379	6.975
Pacific	0.67	...	0.549	...
OECD	21.44	...	17.695	...
Former USSR	7.49	...	7.194	7.560
Eastern Europe	0.18	...	0.204	...
China	3.19	3.206	3.195	3.195
Latin America	3.78	...	3.409	3.565
Africa	2.79	...	2.499	2.650
Middle East	1.88	...	1.941	1.915
Asia	2.22	...	1.964	2.995
Other	...	24.137	...	...
Non-OPEC crude	...	38.037	38.101	...
Non-OPEC NGLs	...	4.301	...	...
Total non-OPEC	42.970	42.338	...	42.555
World total output	72.410	71.596	70.250	71.890
Memo: Crude Oil	...	64.762	64.564	...
NGLs	...	6.834	5.686	...

PROCESSING GAINS

For the entire world, the recent history of processing gains is displayed in Table 5. Statistics for the U.S. collected by the Energy Information Administration (EIA) are by volume (bbl), as is true for Canadian statistics (cu m). For other OECD members, statistics are by weight (metric t), although it is easy enough to convert them to volume and then calculate processing gains. For the rest of the world, exact calculations can be made through 1996. The estimates for 1997 and later are reasonably close.

Looking at the data, global processing gains reported in *OMR* are ridiculously low—they are even less than the total GL&L reports for just OECD countries. If one assumes that EIA's figures for deliveries and production are on target in *OMR*, then the balancing item for stocks should be *negative* (i.e., phantom drawdowns). To achieve a balance between deliveries and supply, the other options are:

1. Understate deliveries
2. Overstate production
3. Do some of both

In practice, *OMR* has employed the third option.

Figures for deliveries in non-OECD countries—which are mislabeled “demand”—are calculated on the production basis, while the OECD numbers are close to being figured on the deliveries basis. This mixture is inaccurate,

Table 7. Production in 1999, million bpd*

	Crude	Bitumen & tar	Condensate	Other/ NGL
Algeria	0.757	...	0.390	0.245
Indonesia	1.247	...	0.144	0.093
Iran	3.292	...	0.018	0.135
Iraq	2.558	...	...	0.092
Kuwait	1.623	...	...	0.152
Libya	1.336	...	...	0.063
Neutral Zone	0.498	...	...	...
Nigeria	1.777	...	0.105	0.078
Qatar	0.604	...	0.083	0.097
Saudi Arabia	7.334	...	...	1.028
United Arab Emirates	2.052	...	0.180	0.238
Venezuela	2.770	0.08	0.018	0.197
OPEC Crude	25.848	0.08	...	...
OPEC NGLs	...	...	0.938	2.418
United States	5.575	...	0.492	1.903
Canada	1.345	0.568	0.008	0.698
Mexico	2.808	...	0.086	0.351
Western Europe	5.912	...	0.443	0.441
Pacific	0.391	...	0.154	0.120
OECD	16.031	0.568	1.183	3.513
Former USSR	7.161	...	0.227	0.209
Eastern Europe	0.207	...	0.014	0.011
China	3.155	...	...	...
Latin America	3.331	...	0.040	0.121
Africa	2.569	...	0.049	0.077
Middle East	1.787	...	0.021	0.050
Asia	1.695	...	0.141	0.244
Non-OPEC crude	35.936	0.568	...	...
Non-OPEC NGLs	...	...	1.675	4.225
World total output	61.784	0.648	2.613	6.643
Memo: Crude Oil	...	62.432	...	...
NGLs	...	9.256	...	...

*Calculated by Groppe, Long & Littell

although the result would result in a balance—the error in deliveries being offset by the error in processing gains—*provided* that the production figures are accurate.

DEFINITIONS AFFECT OUTPUT ESTIMATES

The “missing barrels” (i.e., *positive* balancing items in stocks) result from *OMR*'s overstatement of production. For 1999, *OMR*'s production estimates are compared with those by EIA, *Oil and Gas Journal (O&GJ)* and British Petroleum (BP) in Table 6. One should note that *OMR* routinely reports more production—both OPEC and non-OPEC—than anyone else would believe exists.

A better approach is to begin with trade statistics—imports and exports—and work back toward estimates of production. Large amounts of money change hands in the oil trade, and most of it is routine. For 1999, our efforts at GL&L to track trade flows resulted in the production figures listed in Table 7.

Whether or not either bitumen or tar should be classified as crude oil can be debated. If they are classified as such in Canada—the usual practice—then they should be treated the same in Venezuelan data, as well. In the U.S., EIA carefully labels what is usually termed crude oil as production of crude oil and “lease condensate.” In EIA's system, lease condensate refers to the volume of liquids recovered at lease separators—about 470,000 bpd in 1999. Condensate separated at the

inlets of gas processing plants—200,000 bpd or so—is classified as part of “pentanes plus,” which is predominantly natural gasoline.

OPEC adopted a formal definition of condensate in 1988, because the group’s quotas apply only to crude oil. That action ended an attempt by Venezuela to reclassify a substantial volume of light crude oil as condensate. In addition to bitumen, Venezuela is notable for production of heavy oil. Whether all or some of that output is something other than crude oil has never been debated.

In assessing OPEC production, it is natural for the trade press to follow non-OPEC statistical convention and include condensate in figures for crude oil. Algeria is a notable exception, because condensate is rarely blended with crude oil there. Furthermore, Algerian production of both condensate and NGLs is almost never discussed with the media.

STATISTICS DO MATTER

OPEC controls the oil market through its members’ production quotas. Because oil consumption does not change much over a wide range of prices, relatively small mistakes in setting quotas can have a big impact on prices in either direction. At the November 1997 meeting in Jakarta, Indonesia, the belief among OPEC ministers that they were already producing 27.2 million bpd of crude was a basic rationale for raising quotas to a total of 27.5 million bpd. Disaster quickly ensued, even before Iraq escaped the UN oil embargo in June 1998.

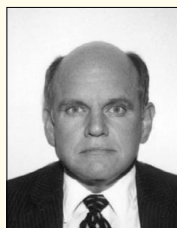
The production “cuts” of 1998 resulted from a wildly exaggerated, February production number published *ad*

nauseam by the media. Actual OPEC output was *up* in 1998, *not down* versus 1997. In March 1999, OPEC ministers finally reduced actual production and were surprised by the results.

Including bitumen from Venezuela, OPEC oil production in 1999 was almost exactly equal to the average quotas that comprised the 25.93-million-bpd target. Reports of production of 26.5 to 26.8 million bopd in the media gave rise to allegations of quota-cheating. At the lower end, the 600,000-bopd difference is about equal to the volume of condensate produced by OPEC members, excluding Algeria.

If OPEC ministers believe *OMR* and the media, then it will be easy to set quotas too high. It is very possible for these ministers to cause another period of low prices, even though most of OPEC members are operating at, or close to, oil production capacity. **wo**

THE AUTHOR



George S. Littell has been a partner of the firm of Groppe, Long & Littell since 1976. Over the last 20 years, this firm has accurately predicted price and supply and demand movements, including the sudden jump by crude prices to \$20/bbl by mid-1999. Successor to a firm founded in 1955, Groppe, Long & Littell has its office in Houston.