

Comparison of Natural Gas Storage Estimates from the EIA and AGA

Many customers are now making their own arrangements to purchase, store and transport their gas supplies. Underground natural gas storage facilities and operations have taken on a higher profile in today's restructured, competitive natural gas market than they previously had. The way storage is managed by the industry continues to evolve, with a general trend towards maintaining lower inventories than had previously been the case.

The Energy Information Administration (EIA) has been publishing monthly storage information for years. In order to address the need for more timely information, in 1994 the American Gas Association (AGA) began publishing weekly storage levels. Both the EIA and the AGA series provide estimates of the total working gas in storage, but use significantly different methodologies. The two surveys ask a different series of questions. Furthermore, while EIA collects information from all storage operators, the AGA collects information from a volunteer subset of the universe and prepares regional and national estimates of working gas volumes based on that sample. (See Box). This article compares these estimates over the period from January 1994 through July 1997.

Because the AGA survey estimates storage on Fridays and the EIA at the end of the month, the AGA weekly data bracketing the end of the month have been interpolated to allow comparison with EIA data. At the national level, EIA and AGA estimates track quite well, though there are clear and recurring differences between the two. The two series closely agree at the beginning of the heating season (Figure 1) showing no more than 78 billion cubic feet or 3 percent difference in October 1996. As the heating season proceeds, the estimates by AGA indicate a greater decrease in working gas in storage than those from EIA. By the end of the heating season, the EIA and AGA estimates usually reach their greatest divergence. This difference has ranged from 111 Bcf or 12 percent in March 1994 to 185 Bcf or almost 25 percent in March 1996. Through the refill season (April 1 through October 31), the AGA estimates show sufficient buildup that they once again more closely agree with the EIA estimates at the beginning of the following heating season. In summary, the AGA estimates indicate a larger and more rapid drawdown and buildup of gas storage than do those of EIA (Table 1).

However, at the regional level, differences between the series are more pronounced with some systematic variations apparent.

Eastern Consuming Region. The AGA's Eastern Consuming Region has between 55 and 60 percent of the nation's underground storage capacity. Although respondents to the AGA survey represent more than 90 percent of the gas storage in these States, the differences between estimates of working gas by AGA and EIA for the region are the greatest not only in volume amounts but also in percentage differences. The greatest differences between the two data series appear during March and April. The size of these differences has increased during the past 3 years (Table 1). In the Eastern Consuming Region, furthermore, the EIA figure is always greater than that derived from the AGA survey.

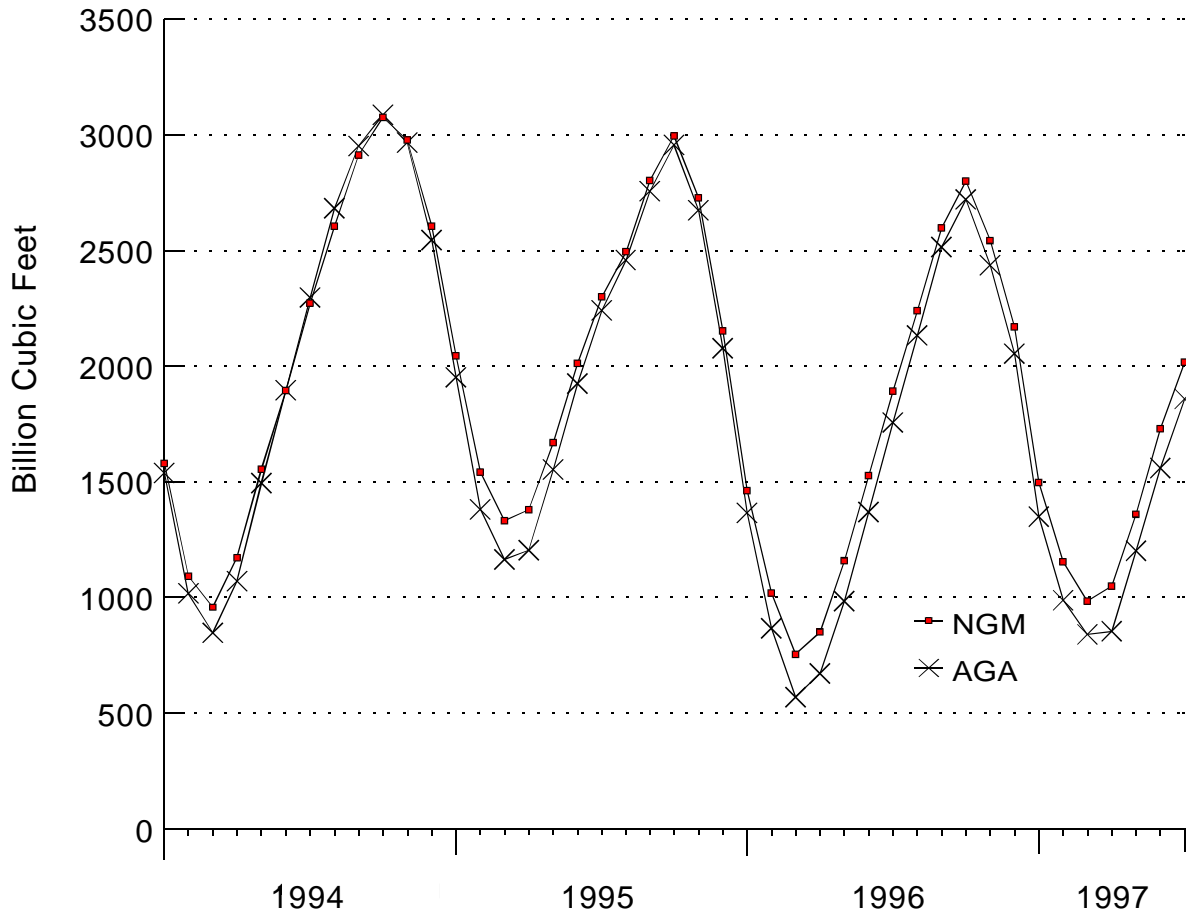
Producing Region. Between 25 and 30 percent of storage capacity is located in the AGA's producing region. While there were large differences between the AGA and EIA estimates in 1994 for this region, the differences in 1995 and 1996 were of a smaller magnitude and more regular pattern (Figure 2). During these latter two years, they ranged from AGA estimates being approximately 40 Bcf greater to 40 Bcf lower than those of EIA. EIA's estimates were greater than AGA's between February and June, while AGA's estimates exceeded those of EIA the other months.

Western Consuming Region. Storage fields in the Western Consuming Region account for about 15 percent of national storage capacity. There are substantially fewer fields in this region than in the other two, as well as fewer operators. The AGA survey captures 96 percent of the storage and differences between the two data series are minimal. Since mid-1995, the two surveys have agreed within 5 Bcf.

Evaluation of Differences

Both EIA and AGA are investigating possible reasons for the systematic pattern of differences between the two series of estimates. Figure 2 graphically shows the pattern of differences in storage estimates, both nationally and by AGA region, between the two systems. It is clear that the major difference lies in the Eastern Consuming Region, though reasons are not at all straight forward. There are subtle but meaningful differences in the methodology behind each system's measurement: different questions are asked; different processes are used to derive storage estimates from the raw answers to the questions; and different coverage levels exist.

Figure 1. Working Gas in Underground Storage in the United States



Sources: Energy Information Administration (EIA), Form EIA-191, "Underground Natural Gas Storage Report," and American Gas Association (AGA), American Gas Storage Survey.

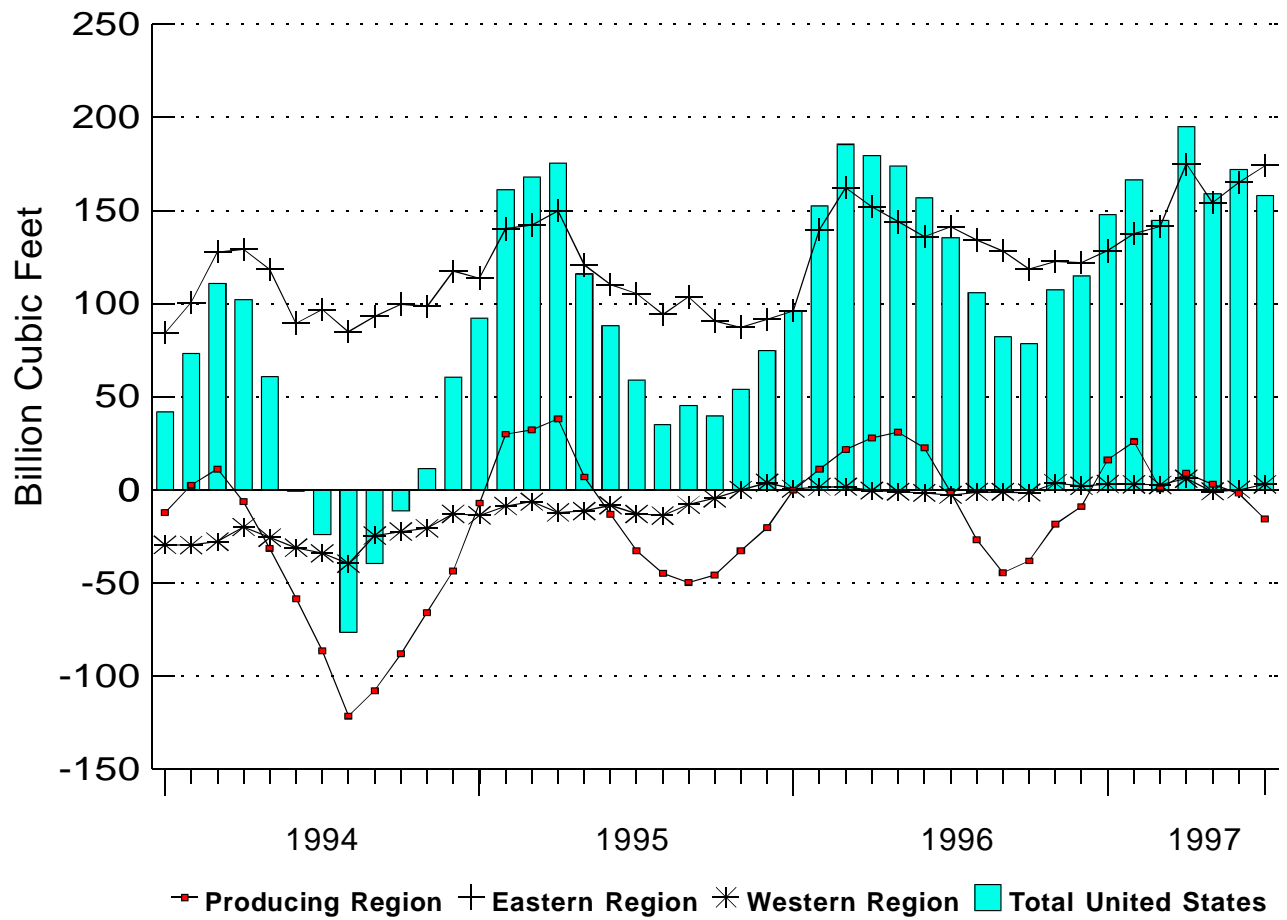
Table SR1. EIA Estimates of Working Gas in Storage and Differences with AGA Estimates
(Billion Cubic Feet)

Year and Month	EIA Estimates by Region				Differences by Region ¹			
	Producing	Eastern Consuming	Western Consuming	Total	Producing	Eastern Consuming	Western Consuming	Total
1994								
January	394	905	280	1,579	-12	84	-30	42
February	297	584	209	1,091	3	101	-30	73
March	290	467	201	958	11	128	-28	111
April	356	599	216	1,172	-7	129	-20	102
May	461	831	262	1,554	-32	118	-26	61
June	516	1,086	294	1,896	-59	89	-31	-1
July	605	1,343	326	2,273	-87	97	-34	-24
August	678	1,579	350	2,607	-122	85	-40	-77
September	748	1,776	388	2,912	-108	93	-25	-40
October	783	1,885	406	3,075	-88	100	-23	-11
November	776	1,820	382	2,978	-66	99	-21	11
December	674	1,590	343	2,606	-44	118	-13	60
1995								
January	550	1,207	289	2,045	-7	114	-14	92
February	456	815	271	1,542	30	140	-9	161
March	416	664	251	1,332	32	142	-7	168
April	458	675	247	1,379	38	150	-12	175
May	533	851	284	1,668	7	121	-12	116
June	600	1,086	328	2,014	-13	110	-9	88
July	638	1,301	362	2,301	-33	105	-13	59
August	635	1,487	373	2,495	-45	94	-14	35
September	713	1,690	398	2,802	-50	104	-8	45
October	766	1,811	419	2,996	-46	91	-5	40
November	700	1,608	420	2,728	-33	87	0	54
December	552	1,234	367	2,153	-21	91	4	75
1996								
January	368	812	281	1,461	0	96	0	96
February	262	520	237	1,019	11	140	2	152
March	192	342	221	755	22	162	2	185
April	220	399	232	851	28	152	-1	179
May	275	614	269	1,158	31	144	-1	174
June	334	892	300	1,525	22	136	-2	157
July	385	1,195	313	1,893	-1	141	-3	135
August	467	1,459	314	2,240	-27	134	-1	106
September	570	1,697	330	2,597	-45	128	-1	82
October	630	1,836	333	2,800	-38	118	-2	78
November	557	1,665	323	2,544	-19	123	4	107
December	463	1,425	282	2,170	-9	122	2	115
1997								
January	314	966	216	1,497	16	128	3	148
February	263	713	179	1,154	26	138	3	166
March	293	520	172	985	1	141	3	145
April	326	539	185	1,049	9	175	6	195
May	401	731	228	1,360	3	154	-1	159
June	473	985	273	1,731	-2	165	0	172
July	485	1,227	307	2,018	-16	174	3	158

¹ The differences are the Energy Information Administration (EIA) estimates minus the American Gas Association (AGA) estimates.

Sources: Energy Information Administration (EIA), Form EIA-191, "Underground Natural Gas Storage Report," and American Gas Association (AGA), American Gas Storage Survey.

Figure 2. Differences between EIA and AGA Estimates of Working Gas in Underground Storage



Sources: Energy Information Administration (EIA), Form EIA-191, "Underground Natural Gas Storage Report," and American Gas Association (AGA), American Gas Storage Survey.

Underlying the AGA's estimation procedure is the assumption that operations in fields not included in the survey are similar to those for which reports are submitted. If operational behavior is quite different between the two, some of the difference in the two estimate series may be accounted for. In fact, there is a rather large degree of heterogeneity in operations by reporting company in the EIA-191 survey. Some operators maintain relatively high levels of storage throughout the year. If these companies are not included in the AGA survey, this difference could contribute to some of the difference in patterns between the two estimates. During the drawdown season, those fields do not draw against their inventories as quickly as the others nor do they refill as quickly as their counterparts during the refill season. If these fields are not represented in the AGA sample, the pattern of working gas over time for the companies included in the AGA sample would have greater variability than that of companies not included. Application of the ratio of current to maximum gas in storage by the responding companies, replicating those companies patterns, would then exaggerate the total drawdown and build up, which is the outcome seen in the Eastern Consuming Region.

Summary

In response to the public's need for more timely estimates of natural gas storage, the American Gas Association prepares weekly estimates of volume of working gas in storage based on a voluntary weekly survey. Volunteers to this survey control a major proportion of gas storage. These estimates are published the middle of the week following the reference week. The Energy Information Administration carries out a monthly survey of all storage operators, which monitors volumes of working gas in storage as well as base gas, injections, and withdrawals. Results of this more comprehensive survey are published 2 months following the reference month.

During the years of both surveys, a recurring pattern of relationship between the two has been seen. While the two series start the heating year showing approximately the same volume of working gas, the AGA series indicates a faster and larger withdrawal than the EIA's series. The resulting difference has been as great as 195 Bcf in April 1997. Furthermore, the cause of this difference seems to be centered in the AGA's Eastern Consuming Region.

Data Collection Methodologies Are Significantly Different Between EIA and AGA

EIA's Working Gas Storage Data. The Energy Information Administration (EIA) uses the monthly survey, Form EIA-191, "Monthly Underground Gas Storage Report" to obtain storage data from all known underground storage facilities, which include more than 100 underground storage companies with more than 400 storage facilities. The EIA-191 survey requests that respondents report monthly balances of base, working, and total gas in storage. Through this survey, EIA measures the volume of natural gas in storage as well as the monthly level of injections and withdrawals. Annual information is collected on field capacity, maximum deliverability, type of facility, and pipeline connection. The survey frame is continually updated, with companies and storage facilities being added as they become operational. Results of this survey are reported for all storage operators in national and State level detail by month in the *Natural Gas Monthly* 2 months following the report month. Additionally, because of the high level of interest in storage inventories, EIA has been publishing preliminary estimates of the working gas storage levels at the national level for the 2 most current months. These preliminary estimates, arrived at through application of EIA's Short-Term Integrated Forecasting System (STIFS) model are not included in this discussion.

AGA Methodology for the Weekly Survey. Since 1994, the American Gas Association (AGA) has conducted a weekly survey of gas storage, presenting the results on a national level and separately within three regions of the country: the Producing Region, the Eastern Consuming Region, and the Western Consuming Region. The survey, reporting working gas in storage the previous Friday, is submitted each Monday to the AGA by a volunteer group of storage field operators. The respondents report three data points for each region in which they have storage operations: levels of working gas in storage in that region on Friday and the corresponding Friday 1 year earlier, and the maximum working gas storage volume they had over the past 5 years. AGA staff aggregate these figures by region and calculate a "percentage full" value for respondents. This percentage is then applied to the maximum end-of-month working gas level for the region that had been published by EIA to estimate a regional figure for working gas. The three regional estimates are published separately and combined to a national total estimate.

On Wednesday afternoon, the AGA publishes the regional and national estimates for the previous week, as well as for the week immediately preceding and the corresponding week the previous year. They also provide information concerning the inclusiveness of the sample and the background information used in determining the estimates.