

Natural Gas Market Centers: A 2008 Update

This special report looks at the current status of market centers in today's natural gas marketplace, examining their role and their importance to natural gas shippers, pipelines, and others involved in the transportation of natural gas over the North American pipeline network. Questions or comments on the contents of this article should be directed to James Tobin at james.tobin@eia.doe.gov or (202) 586-4835.

Natural gas market centers first began to develop in the late 1980s following the implementation of the initial open-access transportation initiative under the Federal Energy Regulatory Commission's (FERC) Order 436 (1985).¹ Market centers since have become a key component of the North American natural gas transportation network (see box, "Market Center Development"). Located at strategic points on the pipeline grid, these centers offer essential transportation service for shippers between pipeline interconnections, as well as provide these shippers with many of the physical and administrative support services formerly handled by the natural gas pipeline company as "bundled" sales services.²

The day-to-day operations of a market center are usually managed by two separate parties: the center's administrator, who provides customer contact and handles administrative tasks, and a pipeline operator who carries out the physical operations at the direction of the administrator. Both the operational infrastructure among market centers and the services offered vary considerably (see box, "Market Center Configurations").

The key services offered by most market centers include the physical coverage of short-term receipt/delivery balancing needs such as parking and loaning services, compression services, and pooling (see box, "Market Center Services"). Many of these market centers also provide new and innovative services that expedite and improve the natural gas transportation process. For instance, many market centers include access to internet-based natural gas trading platforms and capacity release programs, in addition to interactions that support title transfer services between parties who buy, sell, or move their natural gas through the center.

Overview

For a market center to be successful, liquidity is very important. A market center's location must be able to sustain sufficient trading interest among natural gas customers to

successfully generate enough transportation and other service revenues to support its business interests. It cannot remain in business in the long-term if it cannot provide shippers (buyers/sellers) the opportunity to route their shipments to alternative destinations with the best price opportunities and provide basic support services such as title transfer, parking, and loaning of natural gas on a short-term basis.

In 2008, there were 33 operational market centers in the United States and Canada (Table 1, Figure 1), 9 in Canada and 24 in the United States.³ While the number of operational centers in the United States and Canada has remained essentially the same since the late 1990s, there have been significant expansions at many of these market centers, especially at several strategic locations along the natural gas pipeline transportation network. For instance:

- **At least four existing market centers in the United States experienced more than a doubling of daily throughput volumes or pipeline interconnection capacity (Table 2).** The Perryville Hub, owned and operated by Centerpoint Energy Inc., experienced the largest growth. Located in northern Louisiana, this market center has benefited from being along a major natural gas transportation corridor. This corridor links the expanding production of the east Texas' Barnett shale and Bossier formation areas with many new and existing major interstate natural gas pipeline interconnections that provide transportation to the Southeast and Northeast regions.
- **One new market center became active in the United States (Table 1) during the past 5 years.** The newest market center is the White River Hub, located in western Colorado, owned by a partnership between Enterprise Products Partners, LP and Questar Gas Company. The White River Hub was created to provide natural gas producers in the Piceance and Uinta basins access to the multiple intrastate and interstate pipelines

¹See Energy Information Administration, *Natural Gas: Major Legislative and Regulatory Actions (1935 - 2008)* http://www.eia.doe.gov/oil_gas/natural_gas/analysis_publications/ngmajorcg/ferc436.html

² In 1992, the Federal Energy Regulatory Commission issued its Order 636, which required interstate natural gas pipeline companies to transform themselves from buyers and sellers of natural gas (bundlers) to strictly common-carrier transporters offering unbundled services.

³The Energy Information Administration (EIA) last examined market centers in 2004. See EIA, *Natural Gas Market Centers and Hubs: A 2003 Update*. The Federal Energy Regulatory Commission previously explored the subject with its report "The Development of Market Centers and Electronic Trading in Natural Gas Market," Office of Economic Policy Discussion Paper 99-01, 1999.

Table 1. Administrative Profile of Operational Natural Gas Market Centers in the United States and Canada, 2008

Region/ State/ Province	Market Center	Administrator	On Line Customer Service System	Type of Infrastructure	Type of Operation	Year Started	Associated Processing Plant	Associated Storage	
								Sites Names	Type of Storage Field(s)
Central									
Colorado	Cheyenne Hub	Colorado Interstate Gas Co	CIG-Xpress	Header	Market Hub	2000	No	Young/Ltigo/Huntsman	Indirect
Colorado	White River Hub	White River Hub LLC	Questor	Header	Production Hub	2008	Meeker	None	N/A
Kansas	Mid-Continent Center	Oneok Gas Transportation LLC	Caminus	Partial Pipeline	Market Center	1995	Spivey/Frontier	Brehm, Konold	Depleted Field
Wyoming	Opal Hub	Williams Field Services Co	GasKit	Header	Production Hub	1999	Opal	None	N/A
Midwest									
Illinois	ANR Joliet Hub	ANR Pipeline Co	Gems	Partial Pipeline	Market Center	2003	Aux Sable	Linepack & Michigan Sites	Various
Illinois	Chicago Hub	Enerchange Inc	"Gas Exchange"	Partial Pipeline	Market Center	1993	No	Unused WG capacity	Mixed
Northeast									
New York	Iroquois Center	Iroquois Gas Trans Co	Iroquois OnLine	Entire Pipeline	Market Center	1996	No	Avg. 200MMcf/d - Linepack	Linepack
Pennsylvania	Dominion Hub	Dominion Transmission Inc	EScript	Entire Pipeline	Market Center	1994	No	All Dominion Sites	Depleted Field
Southwest									
Louisiana	Egan Hub	Egan Hub Partners LP	LINK System	Header	Storage Hub	1995	No	Egan storage	Salt Dome
Louisiana	Henry Hub	Sabine Hub Services Inc	HubLink	Header	Market Center	1988	No	Jefferson Island	Salt Dome
Louisiana	Jefferson Island	Jefferson Island Storage & Hub LLC	Latitude	Header	Storage Hub	1998	No	Jefferson Island	Salt Dome
Louisiana	Nautilus Hub	Enbridge Offshore Pipelines	Quorum System	Header	Production Hub	2000	Neptune	None	N/A
Louisiana	Perryville Center	Centerpoint Energy Gas Trans	ServiceLynx	Partial Pipeline	Market Center	1994	No	Ruston, Ada, Childes	Depleted Field
New Mexico	Bianco Hub	Transwestern Gas Pipeline Co	TW Transfer	Header	Production Hub	1993	No	Kutz/Milagro	Linepack
East Texas	Aqua Dulce Hub	ConocoPhillips Inc	Fax-phone only	Header	Production Hub	1990	No	King Ranch	N/A
East Texas	Carthage Hub	DCP Midstream Partners LP	Fax-phone only	Header	Production Hub	1990	No	Carthage	Indirect
East Texas	Katy (DCP) Hub	DCP Midstream LP	Fax-phone only	Header	Production Hub	1995	No	Katy	None
East Texas	Katy Storage Center	ENSTOR Energy Inc	Latitude	Header	Storage Hub	1993	No	Katy	Depleted Field
East Texas	Moss Bluff Hub	Moss Bluff Hub Partners LP	LINK System	Header	Storage Hub	1994	No	Moss Bluff	Salt Dome
West Texas	Waha (EPGT) Texas Hub	Enterprise Products Pipeline LP	StarWeb	Partial Pipeline	Production Hub	1995	Waha	Boling	Salt Dome
West Texas	Waha (DCP/Atmos) Hub	DCP Midstream LP	CAMINUS	Header	Production Hub	1995	No	None	N/A
Western									
California	California Energy Hub	Southern California Gas Co	ENVOY	Entire Pipeline	Market Center	1994	No	All SoCal fields-Interruptible	Depleted Field
California	Golden Gate Center	California Gas Transmission Co	PipeRanger	Entire Pipeline	Market Center	1996	No	All PG&E- Interr & Linepack	Depleted Field
Oregon	GTNW Market Center	Gas Transmission - NW	Pacific Express	Entire Pipeline	Market Center	1994	No	System Linepack Only	N/A
Canada									
Alberta	AECO-C Hub	Encana Energy Co	AECO-LINK	Entire Pipeline	Market Center	1990	No	Suffield, Countess	Depleted Field
Alberta	Alberta Hub	ENSTOR Energy Inc	Latitude	Header	Storage Hub	1997	No	Alberta Hub	Depleted Field
Alberta	Alberta Market Centre	Atco Midstream Ltd	Fax-phone only	Header	Storage Hub	1998	No	Carbon Facility	Depleted Field
Alberta	Crossfield Hub	Crossalta Gas Storage & Services	Fax-phone only	Header	Storage Hub	1995	No	East Crossfield	Depleted Field
Alberta	Empress Center	Transcanada Gas Pipelines Ltd	NRGhighway	Header	Market Hub	1986	No	Linepack	Depleted Field
Alberta	Intra-Alberta Center	Transcanada Gas Pipelines Ltd	NGX Trading Sys	Partial Pipeline	Market Center	1994	No	Indirect	Depleted Field
British Columbia	Sumas Center	Spectra Energy Corp	Yes-Non Specific	Partial Pipeline	Market Hub	1994	McMahon,Kwoen	Aitken Creek- Indirectly	Depleted Field
Alberta/Quebec	TransCanada Center	Transcanada Gas Pipelines Ltd	NRGhighway	Entire Pipeline	Market Center	1998	No	Indirect only	N/A
Ontario	Dawn Market Center	Spectra Energy Corp	Unionline	Entire Pipeline	Market Center	1985	No	Dawn (18 Pools)	Depleted Field

N/A = Not applicable, Interr = interruptible, WG = working gas. See Table 2 and Figure 2 for additional detail.

Source: Energy Information Administration, Office of Oil and Gas, Natural Gas Division, Natural Gas Hubs Database, December 2008.

Market Center Development

The installation of market centers and hubs is a relatively recent development in the natural gas industry. Although the concept first evolved in the late 1980s, it was fast tracked after the issuance of FERC Order 636 issued in 1992. Market centers and hubs quickly became a key element in providing novice natural gas shippers with many of the physical capabilities and administrative support services formerly handled by the interstate pipeline company as "bundled" sales services.

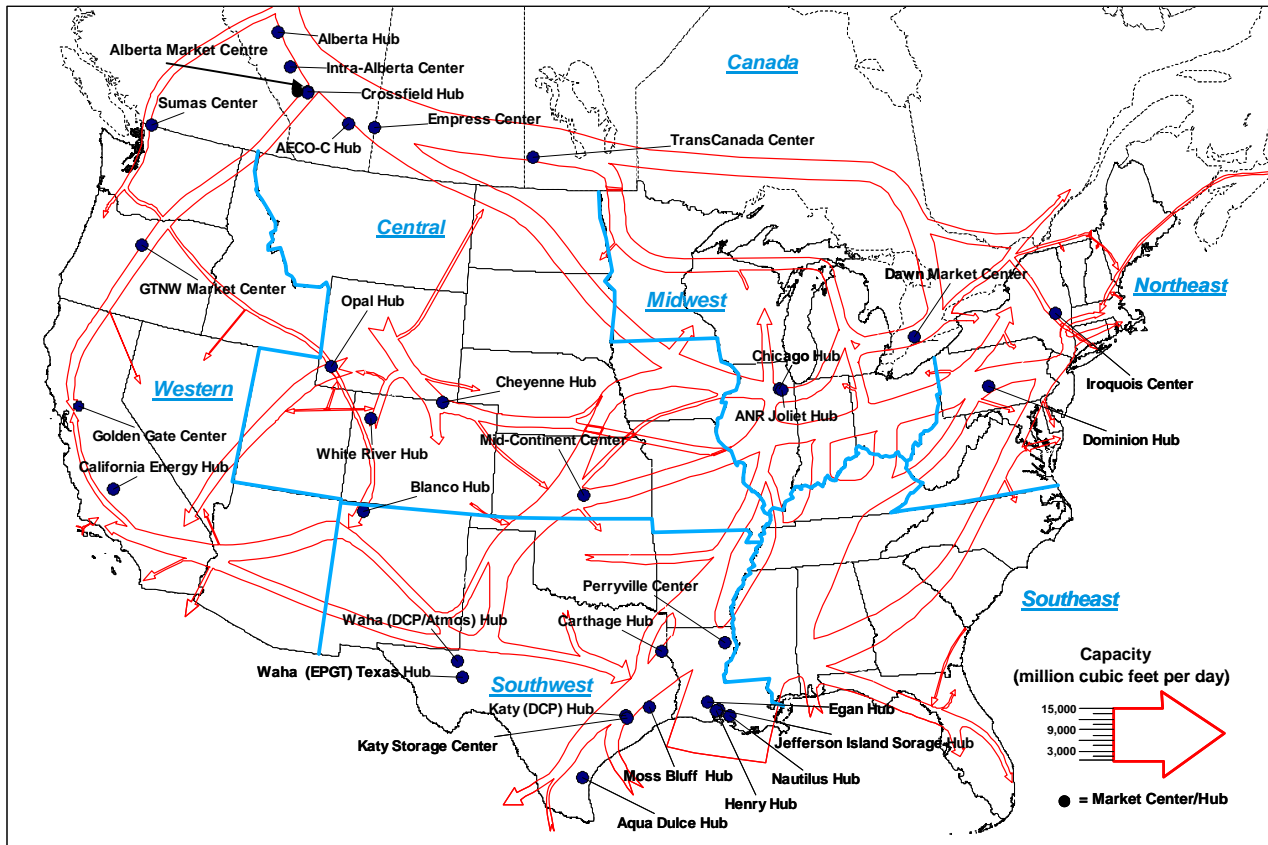
As it implemented Order 636 in 1993, FERC promoted the market center concept. It was suggested that such centers could provide the services that pipeline shipper/customers needed to manage their portfolios of supply, transportation, and storage services previously provided by the merchant pipeline company. Their facilities also could increase the interchange of natural gas across pipeline systems and permit a market to develop for the trading of natural gas volumes, storage, and pipeline capacity. Furthermore, because services would be priced separately, it was suggested that additional efficiencies could develop as competition among centers and pipelines developed over time.

Indeed, the interstate natural gas pipeline system did experience a significant increase in pipeline interconnections after Order 636. Although most of these connections were developed singly, as individual pipeline companies expanded their transportation services and supply sources, market center development nevertheless spurred many additional interconnections.

Nevertheless, the market center concept did not resolve all issues, and so in 2000, FERC issued Order 637. Its purpose was to lessen the impact of imbalance penalties on shippers and the issuance of operational flow orders (OFOs) by interstate pipeline companies. Order 637, in part, required that the (interstate) pipeline transporter "must provide, to the extent operationally practicable, parking and lending or other services that facilitate the ability of shippers to manage transportation imbalances."

By 1998, 36 market centers had been established within the U.S. natural gas pipeline grid. By 2003, however, 13 of these had closed their doors as the concept matured and those that were unable to develop a trading base were eliminated. Currently, 24 market centers in the United States provide hub services to customers, the majority of which are located in the States of Texas and Louisiana.

Figure 1. Natural Gas Centers/Hubs Relative to Natural Gas Transportation Corridors, 2008



DCP = DCP Midstream Partners LP; EPGT = Enterprise Products Texas Pipeline Company.

Note: The relative widths of the various transportation corridors are based upon the total level of interstate pipeline capacity (2008) for the combined pipelines that operate on the generalized route shown.

Source: Energy Information Administration, GasTran Gas Transportation Information System, Natural Gas Market Hubs Database, December 2008.

that now serve the expanding production fields located within the surrounding area.

- **Currently, there are six proposed market centers that may be placed in service during the next 4 to 5 years (Table 3).** With the exception of the Marcellus Eastern Access Hub, proposed by Equitable Midstream LP to serve the western Pennsylvania /West Virginia production area, these potential market centers are predicated upon the development of high-deliverability underground natural gas storage facilities. Of the other “proposed” market centers/hubs, one is in Alabama, two in Mississippi, and two are in Texas. All of the latter five are currently under construction or have been approved by regulatory authorities.

On the other hand, four market centers in the United States have also been deactivated since 2003 (Table 3). The largest of these, the Ellisburg-Leidy Center, served the New York and Pennsylvania areas and ceased formal operations in 2005. Its administrator, National Fuel Gas Supply Company, instead opted to provide hub-like services within its normal system operations instead. Another market center, the Encina Hub located in the Waha area of west Texas,

ceased operations in 2006 when its support pipeline was sold and its operations integrated with other hubs in the Waha area.

Between 2003 and 2008, the operational profile of many of the U.S. natural gas market centers changed markedly. Estimates indicate that transportation activities at U.S. market centers increased on average about 39 percent, with at least 16 of the 24 showing an increase in average daily throughput activity of 10 percent or more (Table 2).⁴ In addition, while the average number of interconnections per market center increased only slightly, six market centers added two or more interconnections during the period. Consequently, total average pipeline interconnect capacity increased by about 50 percent, with three market centers at least doubling their interconnect capacity. Three experienced no growth in interconnect capacity. Only one,

⁴Based primarily on anecdotal information received from market center contacts developed in researching this report. While no specific data were provided that could validate their performance evaluations, the contacts offered their best estimates based on a firm working knowledge of transportation service activities occurring at their center during the past 5 years.

Table 2. Operational Profile of Natural Gas Market Centers in the United States and Canada, by Percent Change in Total Interconnect Capacity, 2003 and 2008

Region/ State/ Province	Market Center	Estimated Average Daily Throughput (MMcf/d)			Number of Pipeline Interconnects			Pipeline Interconnect Capacity (MMcf/d)								
		2003	2008	Percent Change	2003	2008	Percent Change	Total ¹			Delivery			Receipt		
								2003	2008	Percent Change	2003	2008	Percent Change	2003	2008	Percent Change
United States																
Louisiana	Perryville Center	600	1,800	200	11	17	55	2,351	11,800	402	2,251	11,800	424	1,601	6,300	294
Louisiana	Egan Hub	1,000	2,000	100	7	10	43	1,650	4,545	175	1,650	4,545	175	1,650	4,227	156
Colorado	Cheyenne Hub	1,100	1,800	64	5	7	40	2,854	6,396	124	2,854	6,396	124	1,780	2,625	47
Wyoming	Opal Hub	750	1,450	93	4	8	100	3,250	6,038	86	3,250	4,588	41	1,100	1,450	32
East Texas	Moss Bluff Hub	1,000	1,600	60	6	6	0	1,425	2,425	70	1,425	2,425	70	1,425	2,425	70
Louisiana	Henry Hub	600	900	50	14	14	0	2,470	3,670	49	1,865	3,220	73	2,120	3,135	48
California	California Energy Hub	550	900	64	5	12	140	4,600	6,784	47	1,000	1,600	60	4,600	5,184	13
Pennsylvania	Dominion Hub	2,180	2,500	15	16	17	6	5,893	8,348	42	5,213	6,915	33	3,351	4,111	23
Illinois	ANR Joliet Hub	400	600	50	10	10	0	3,900	5,390	38	2,300	3,590	56	2,600	2,725	5
California	Golden Gate Center	1,900	2,000	5	8	9	13	4,545	6,017	32	900	932	4	4,245	6,017	42
New Mexico	Blanco Hub	850	1,200	41	10	10	0	3,455	4,200	22	2,130	2,700	27	1,575	2,200	40
West Texas	Waha (DCP/Atmos) Hub	300	300	0	10	10	0	1,950	2,330	19	650	1,950	200	1,300	1,400	8
Oregon	GTNW Market Center	2,100	2,300	10	4	4	0	5,675	6,380	12	3,330	3,445	3	3,706	4,481	21
Louisiana	Jefferson Island Hub	420	500	19	8	9	13	2,045	2,295	12	1,833	2,083	14	2,045	2,295	12
East Texas	Carthage Hub	550	600	9	9	11	22	1,520	1,700	12	1,275	1,500	18	715	800	12
East Texas	Aqua Dulce Hub	400	400	0	9	9	0	1,528	1,690	11	873	1,035	19	655	655	0
Illinois	Chicago Hub	100	100	0	7	8	14	2,175	2,375	9	1,335	1,535	15	2,175	2,375	9
New York	Iroquois Center	950	1,400	47	4	4	0	1,950	2,050	5	750	750	0	1,200	1,500	25
East Texas	Katy Storage Center	1,200	1,400	17	13	13	0	2,580	2,615	1	2,605	2,615	0	2,580	2,400	-7
East Texas	Katy (DCP) Hub	120	300	150	9	9	0	1,430	1,430	0	1,350	1,350	0	1,030	1,030	0
Louisiana	Nautilus Hub	270	350	30	8	8	0	2,519	2,519	0	1,950	1,950	0	600	600	0
West Texas	Waha (EPGT) Texas Hub	250	250	0	10	10	0	1,825	1,825	0	1,135	1,135	0	1,825	1,825	0
Kansas	Mid-Continent Center	340	340	0	12	8	-33	1,275	735	-42	467	230	-51	1,275	632	-50
Colorado	White River Hub	N/A	N/A	N/A	N/A	7	N/A	N/A	4,905	N/A	N/A	2,560	N/A	N/A	2,560	N/A
Overall Averages		780	1,087	39	9	10	11	2,733	4,103	50	1,843	2,952	60	1,963	2,623	34
Canada																
Ontario	Dawn Market Center	5,000	9,300	86	9	10	11	6,100	12,800	110	4,100	6,600	61	4,400	10,280	134
British Columbia	Sumas Center	1,200	1,000	-17	5	7	40	2,085	2,335	12	2,085	2,335	12	1,880	1,880	0
Alberta2Quebec	TransCanada Center	5,500	5,500	0	19	19	0	16,016	16,334	2	8,916	10,334	16	6,500	6,000	-8
Alberta	AECO-C Hub	10,000	10,000	0	4	4	0	20,400	20,400	0	12,000	12,000	0	12,000	12,000	0
Alberta	Alberta Hub	900	900	0	1	1	0	650	650	0	650	650	0	650	650	0
Alberta	Alberta Market Centre	550	550	0	4	4	0	1,730	1,730	0	1,730	1,730	0	1,180	1,180	0
Alberta	Crossfield Hub	450	450	0	1	1	0	450	450	0	450	450	0	450	450	0
Alberta	Empress Center	5,400	5,400	0	3	3	0	15,190	15,190	0	8,690	8,690	0	6,500	6,500	0
Alberta	Intra-Alberta Center	11,000	11,000	0	3	3	0	18,600	18,600	0	6,600	6,600	0	12,000	12,000	0

¹ Total capacity will not necessarily equal the sum of Delivery and Receipt capacities because many interconnects are bi-directional, yet are included in the total only once. MMcf/d = Million cubic feet per day.

Source: Energy Information Administration, Office of Oil and Gas, Natural Gas Division, Natural Gas Hubs Database, December 2008.

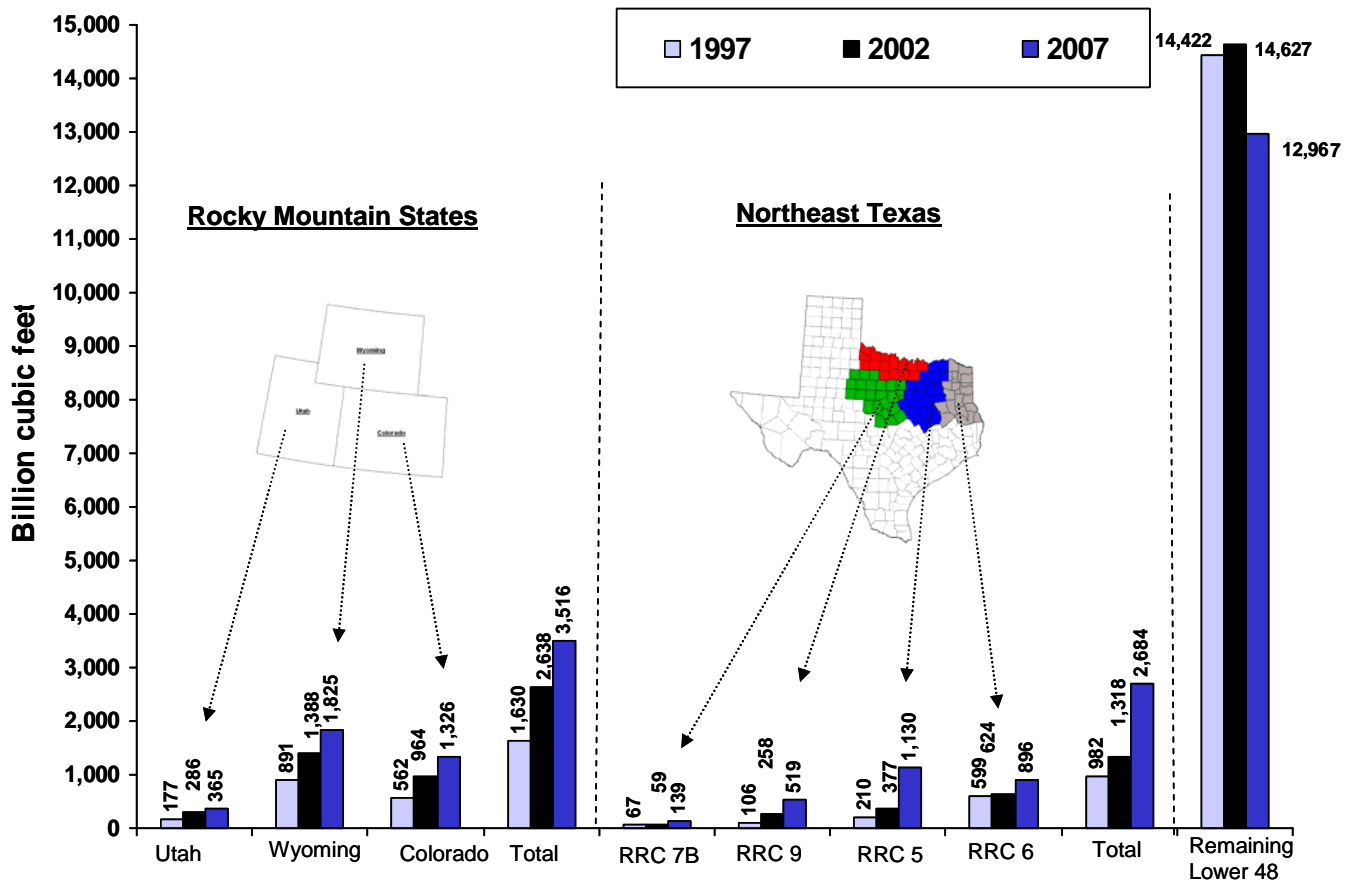
Table 3. Natural Gas Market Centers - Proposed New Sites and Inactivated Sites, 2003 - 2011

State	Year of Action	Market Center	Administrator	Type of Infrastructure	Type of Operation	Associated Storage		Comments
						Sites Names	Type of Storage Field(s)	
Proposed								
Alabama	2012	Mobay Storage Hub	Falcon Gas Storage Inc	Header	Storage Hub	Mobay	Depleted Field	Currently under construction
Mississippi	2011	Mississippi Hub	Bay Gas Storage Co	Header	Storage Hub	Mississippi Hub	Salt Dome	Phase 1 currently under construction
Mississippi	2012	Copiah Storage Hub	Market Hub Partners Inc	Header	Storage Hub	Copiah	Salt Dome	Approved by FERC, construction to commence in April 2009
Pennsylvania	2011	Marcellus Eastern Access Hub	Equitable Midstream LP	Partial Pipeline	Market Center	None	N/A	Depends upon future development of shale gas in the area.
Texas	2009	Waha (ENSTOR) Hub	ENSTOR Energy Inc	Header	Storage Hub	Waha	Salt Dome	Phase 1 currently under construction
Texas	2010	Houston Hub & Transportation	ENSTOR Energy Inc	Header	Market Hub	Houston Hub	Salt Dome	Approved by FERC, construction has not begun
Inactivated								
Pennsylvania	2005	Ellisburg-Leidy Center	National Fuel Gas Supply Co	Partial Pipeline	Market Center	All NFGS fields	Depleted Field	Hub services incorporated into pipeline marketing
Texas	2004	Spindletop Storage Hub	Centana Intrastate Pipeline Co	Header	Storage Hub	Spindletop	Salt Dome	Expense of administrating hub activities not supported
Texas	2005	Waha (Atmos) Hub	Atmos Pipeline - Texas	Header	Market Hub	Indirect access	Salt Dome	Merged operations with DCP Midstream Waha hub
Texas	2006	Waha (Encina) Hub	Sid Richardson Gas Co	Partial Pipeline	Production Hub	None	N/A	Pipeline sold in 2005

N/A = Not applicable.

Source: Energy Information Administration, Office of Oil and Gas, Natural Gas Division, Natural Gas Hubs Database, December 2008.

Figure 2. Natural Gas Production Growth Areas, 1997, 2002, and 2007



RRC = Texas Railroad Commission District.

Source: Energy Information Administration, U.S. Crude Oil and Natural Gas, and Natural Gas Liquids Reserves: 1997, 2002, and 2007 Annual Reports.

the Mid-Continent market center located in Kansas, lost both interconnections and capacity.⁵

The percentage of natural gas transported on the national pipeline grid that goes through a natural gas market center has also increased. Based on annual natural gas transportation volume information reported to the FERC by interstate pipeline companies, the average daily volume of natural gas transported by individual pipelines on the entire interstate network in 2007 was about 101 billion cubic feet per day (Bcf/d).⁶ Estimates of average daily volumes processed through the 24 market centers approximated 25

percent of that figure, or about 25 Bcf/d.⁷ This figure represents a 4-percent increase over 2003 in the portion of natural gas transported nationwide that saw some part of its journey handled by a market center.

Growth Patterns

Natural gas market centers located in areas of expanding natural gas production and along strategic transportation routes downstream of these areas have experienced the greatest levels of growth since 2003. These market centers benefited not only from increased levels of natural gas transportation flows and new natural gas pipeline capacity,

⁵Actually, the Mid-Continent market center lost interconnections, thus receipt/delivery capacity, when it and its supporting Oneok Pipeline system were sold to Oneok Partners LP and the relationship was restructured.

⁶See Federal Energy Regulatory Commission Form 2/2A, "Major and Non-major Natural Gas Pipeline Annual Report," Gas Account data, "Deliveries of Gas to Others for Transportation (Account 858)," 2003 & 2007, <http://www.ferc.gov/docs-filing/eforms/form-2/data.asp#skipnavsub>.

⁷Both this estimate and the 2007 Federal Energy Regulatory Commission average day transport volume of 101 billion cubic feet per day includes some double counting of volumes since a shipment of natural gas may flow through several natural gas pipelines or market centers on its way to the final consumer. Such double counted volumes cannot be discretely identified or eliminated.

but they also attracted additional natural gas trading and new shipper/customers who had a need for the many types of services that these market centers offered.

Two major regions of the United States, the Southwest and Central regions (Figure 1) have been most affected. In the Southwest Region, it has been the areas of northeast Texas and northern Louisiana, while in the Central Region it has been the areas of western Colorado and Wyoming that have seen major production growth and a corresponding increase in market center expansion.

Southwest Regional Centers

During the 10-year period between 1997 and 2007, the area encompassing northeastern Texas experienced more growth than all others in the United States, with natural gas production increasing by 173 percent (Figure 2). Since 2003 alone, natural gas production in this part of the State⁸ grew 104 percent, increasing from 1.3 billion cubic feet (Bcf) in 2002 to 2.7 Bcf in 2007 (this area contains most of the highly prolific Barnett shale and Bossier formation).

More than half (13) of the currently active U.S. gas market centers are situated in the Southwest region; all but one of those 13 being located in Texas and Louisiana (Figure 1). In addition to being the largest natural gas production area in North America, where supplies from a large number of sources are aggregated and traded, the region has a large number of interstate and intrastate pipeline interconnections and 64 underground storage facilities, 8 of which are associated with one or more market centers (Table 1).

The most publicized natural gas market center in North America, the Henry Hub, is located in southwestern Louisiana (Figure 1). The Henry Hub has an extensive receipt and delivery capability with almost 200 customers regularly conducting business at the site through its 11 interconnecting pipeline systems.⁹ The Henry Hub also provides its customers access to the high-deliverability Jefferson Island salt storage cavern facility, which itself operates a separate and distinct market center operation (Table 1). Since 2003, this hub has increased its interconnection capacity by about 50 percent, although it did not add any additional interconnecting pipelines (Table 2). Seven of its 14 interconnections increased in capacity, contributing to an estimated average daily throughput increase of about 50 percent over the period.

⁸ Includes Texas Railroad Commission (RRC) district 5, 6, 7B, and 9.

⁹ The Henry Hub is also the specified delivery point for New York Mercantile Exchange (NYMEX) natural gas futures contracts, although it is not affiliated with the NYMEX.

Two additional market centers operate along the southern Louisiana coast, the Egan Hub Storage Center and the Nautilus Hub. Because the Nautilus Hub confines its operations primarily to supporting the interconnection of offshore Gulf of Mexico production with eight major interstate pipelines onshore, its average daily throughput growth has been relatively small over the past 5 years as offshore production volumes have declined. The Egan Storage Hub, on the other hand, located onshore and benefiting from its location along the route of several interstate pipeline expansions serving the growing production from east Texas fields, has more than doubled its interconnect capacity with the addition of three new interconnections over the past 5 years (Table 2).

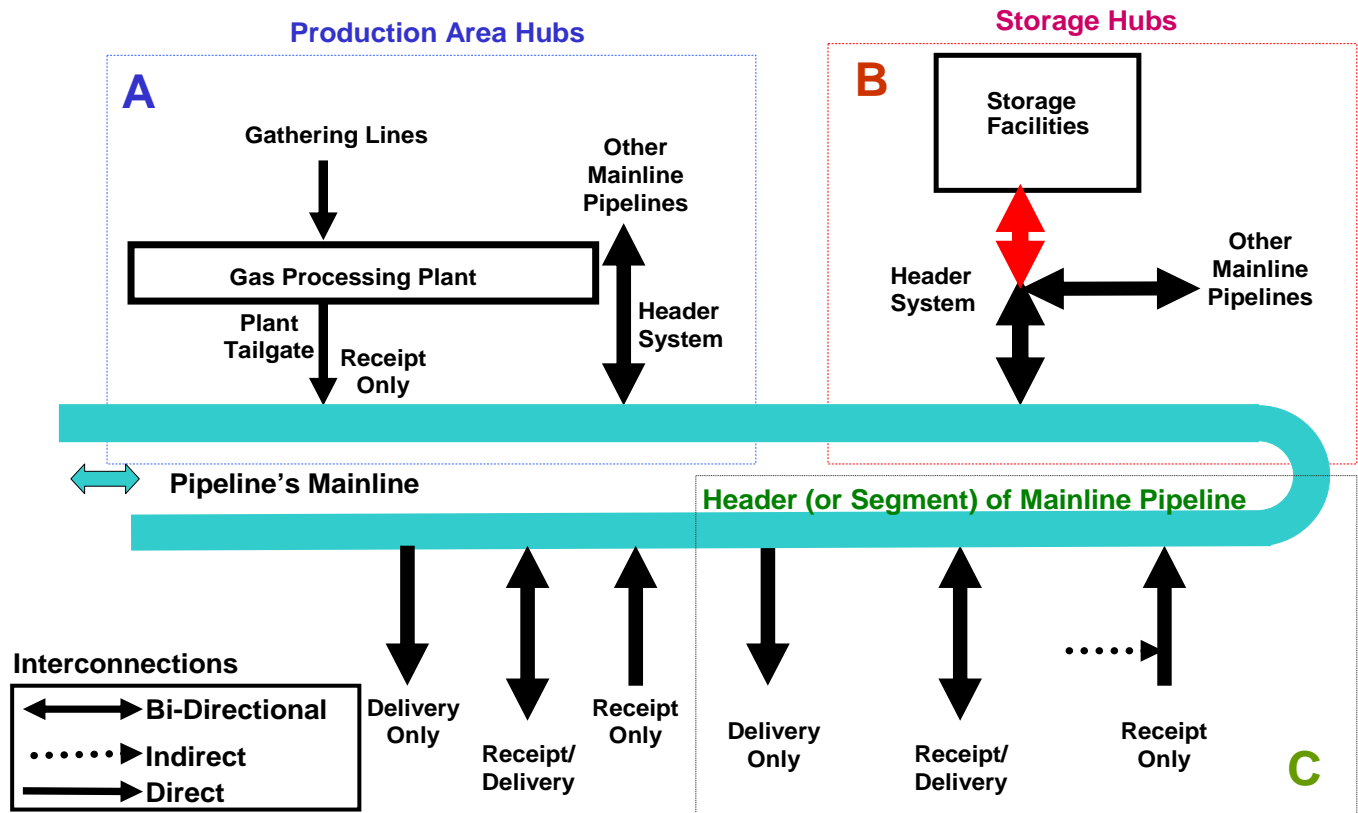
The most significant impact from growing east Texas natural gas production in the Southeast Region has been the large-scale development of new natural gas pipelines extending through northern Louisiana and expansion of several existing ones. Strategically situated in this area, Centerpoint Energy Company's Perryville Hub (Figure 4) has become one of the largest natural gas market centers in North America as a result, with access to 17 pipeline interconnections (15 interstate and 2 intrastate), over 10 Bcf/d of delivery capacity, and more than 6 Bcf/d of receipt capacity (Table 2).

During the past several years alone, at least 3.3 Bcf/d of new interstate natural gas pipeline capacity was installed in and around the Perryville area, much of it with interconnections at the Perryville Hub. In 2009 and 2010, an additional 5.2 Bcf/d of new pipeline capacity is scheduled to be built, much of it potentially accessible through the Perryville Hub.

The impetus for this recent and future pipeline construction has been the rapid and extensive expansion of unconventional shale natural gas in east Texas and the anticipated development of similar resources in the Haynesville Shale Basin of northern Louisiana.

Because most of the natural gas created by the heavy development of the Barnett Shale and Bossier Trend formations has moved eastward into Louisiana, the several market centers located in eastern Texas have not been affected to any great extent. The Carthage Hub, which sits directly on the natural gas transportation route directly linking northeast Texas production and major interstate pipeline interconnections in Louisiana, Mississippi, and Alabama, has added a couple of new pipeline interconnections to its portfolio, but its estimated average daily throughput rate is only slightly more than it was in 2003. As a plant tailgate hub (Figure 3, box A), the capacity of its associated natural gas processing plants limits its throughput. Much of the natural gas flowing along the corridor at this point has already been processed further

Figure 3. Generalized Market Center/Hub Operational Schematic



Note: Storage, Gathering, and Gas Processing Plant facilities are not associated with all market centers/hubs.
Source: Energy Information Administration, Office of Oil and Gas, Natural Gas Division.

Market Center Configurations

Essentially, a natural gas market center exists to provide its customers (shippers and gas marketers primarily) with receipt/delivery access to two or more pipeline systems, provide transportation between these points, and offer administrative services that facilitate that movement and/or transfer of gas ownership. But the infrastructure associated with the market center itself may be configured in several different ways (Figure 3). For instance:

Full Pipeline System – Some market centers are associated with and use all, or a sizable portion, of an entire pipeline system to carry out their operations and provide transportation services to and between all pipeline interconnect points that are part of their system. Its configuration may encompass all or part of the operations and facilities included on Figure 3.

Header System (non-storage) – This form of market center operates using a short portion of a mainline pipeline, or a stand-alone lateral, where two or more pipeline interconnections are concentrated within a relatively short distance from each other. (Figure 3, box C)

Storage Header System – The bi-directional laterals that connect the underground storage facility to the mainline intra- or interstate pipelines are also used to transport a shipper's natural gas between these interconnects (Figure 3, box B). Depending upon the hub services needed by the customer, the transported natural gas may or may not move through the associated storage facilities.

Production Area Header Systems – These market center operations dispatch production volumes onto the mainline transmission grid from interconnections on the header system with other mainline intrastate pipelines, or from the tailgate of a natural gas processing plant (Figure 3, box A). Such centers confine their activities mostly to providing hub services to natural gas producer clients.

Currently, 18 of the 33 active North American market centers can be categorized as header systems, with relatively short distances between pipeline transfer points and other facilities such as storage. The remaining 15 natural gas market centers are associated with and use all, or a sizable portion, of a single pipeline system to carry out their operations and provide transportation services (Table 1).

upstream, and is flowing on large mainline pipelines leading out of the State.

Some of the additional flows of growing northeast Texas production are being transported on a southerly route to interstate interconnections in south Texas and southern Louisiana through market centers located in the Katy area of southeastern Texas (Figure 4). This movement has contributed to greater throughput at these several market centers but has not fostered the addition of any new pipeline interconnections or greater receipt/delivery capacity at existing interconnections. Nevertheless, these market centers are attractive to shippers because they provide interconnections among at least 21 pipelines, including a number of the major interstate pipelines such as Texas Eastern Transmission and Tennessee Gas Pipeline companies, major transporters of natural gas to the Midwest and Northeast markets.

The Carthage area of northeastern Texas, as well as the Katy area to the south, also receives natural gas flowing from the west Texas Waha area. Three major Texas intrastate natural gas pipelines transport natural gas from two market centers located at Waha to east Texas, EPGT Texas Pipeline, directed to the Carthage area, and the Guadalupe and the Oasis pipelines directed to the Katy area.

Central Regional Centers

A number of new natural gas pipelines have been built in the Central region over the past 5 years because of the continuing expansion of natural gas exploration, development, and production of both conventional and unconventional resources in Colorado, Utah, and Wyoming.¹⁰ In addition, several existing natural gas pipeline systems in the region have expanded as well. In turn, the existing natural gas market centers located in the area, specifically the Opal Hub in southwestern Wyoming and the Cheyenne Hub in northeastern Colorado, have added major new interconnections and have expanded their receipt and delivery capabilities during the period (Table 2). In addition, the White River Hub, placed in service in late 2008, addressed the need for market center services for producers and pipelines located in the Uinta/Piceance Basin area of western Colorado and eastern Utah.

Natural gas production in these three States grew 33 percent over the past 5 years and by 116 percent since 1997 (Figure 2). In the Green River Basin of western Wyoming, which accounts for about 90 percent of the State's current natural gas production and where natural gas production has

increased 11 percent since 2003,¹¹ the Opal Hub has experienced a 93 percent increase in estimated daily throughput, added four interconnects, and nearly doubled its receipt/delivery capability (Table 2). The Opal Hub, located at the southern end of the Green River Basin, provides more than 1.45 billion cubic feet (Bcf) of processed natural gas daily to Northwest Pipeline, Colorado Interstate Gas, and the Kern River Transmission systems among others (Figure 5).¹²

The Cheyenne Hub, located in eastern Colorado, has not only profited from the increased natural gas production in the Green River Basin that flows eastward, it has been the destination of a large portion of the natural gas coming out of the Uinta/Piceance Basin expansion. These new flows into the Cheyenne Hub have more than compensated for the one-third decrease in Wyoming's Powder River Basin coalbed methane production, much of which is directed toward the hub. The Cheyenne Hub began operations in 2000 to support the growing need for natural gas transportation out of the Powder River Basin and to provide trading services for eastern Wyoming and northern Colorado area producers and other market makers.

Two new large-capacity pipelines supporting the Cheyenne Hub expansion, the Cheyenne Plains and the Rockies Express, have begun operations with interconnections at the Cheyenne Hub. In addition to these two new pipeline systems, the Trailblazer Pipeline, which increased its capacity in 2002 by 56 percent, or 350 million cubic feet per day, begins at the Cheyenne Hub, also providing customers with access to the Midwest gas market.

The new White River Hub, a partnership between Enterprise Products Partners, LP and Questar Gas Company, operates an 11-mile header system pipeline and offers market center services to producers and pipelines located primarily in the Piceance Basin area of western Colorado (Table 1). Natural gas production in this area of Colorado increased from 14 percent of total Colorado production in 2003 to 28 percent in 2007, supporting development of the White River Hub.

With seven interconnections among area pipelines and gathering operations and a natural gas processing plant, the White River Hub operation essentially formalizes business services that previously had developed among area pipeline interconnection operators. As reference points these

¹⁰Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database, 2008.

¹¹Based on data for Wyoming, Colorado, and Utah, contained in a presentation of the Wyoming Pipeline Authority, *Rockies Natural Gas Resources*, "Wyoming - Top Five Producing Counties" <http://www.wyopipeline.com/information/presentations/2008/May/Final%20Seattle%20Presentation%20May%2013%202008.pdf>.

¹²In May 2003, the Kern River Transmission System doubled its pipeline capacity between Wyoming and California.

Market Center Services

The types of services offered by market centers vary significantly. No two operations are identical in the services offered, and in fact, the features of similarly named services often differ in meaning and inclusions. The list below describes most of the broad types of services offered.

Transportation/Wheeling - Transfer of natural gas from one interconnected pipeline to another through a header (hub), by displacement (including exchanges), or by physical transfer over the transmission of a market center pipeline.

Parking - A short-term transaction in which the market center holds the shipper's natural gas for redelivery at a later date. Often uses storage facilities, but may also use displacement or variations in linepack.

Loaning - A short-term advance of natural gas to a shipper by a market center that is repaid in kind by the shipper a short time later. Also referred to as advancing, drafting, reverse parking, and imbalance resolution.

Storage - Holding natural gas longer than parking, such as seasonal storage. Most often confined to available interruptible storage capacity only.

Peaking - Short-term (usually less than a day and perhaps hourly) sales of natural gas to meet unanticipated increases in demand or shortages of natural gas experienced by the buyer.

Balancing - A short-term interruptible arrangement to cover a temporary imbalance situation. The service is often provided in conjunction with parking and loaning.

Pooling/Volume Aggregation - A pooling transportation service that allows customers to aggregate natural gas from various points within a supply area and have it delivered into downstream firm or interruptible transportation contracts at designated delivery point pooling stations.

Title Transfer - A service in which changes in ownership of a specific natural gas package are recorded by the market center. Title may transfer several times for some natural gas before it leaves the center. The service is an accounting or documentation of title transfers that may be done electronically, by hard copy, or both.

Electronic Nomination - Customers may connect with the market center electronically to enter natural gas transportation nominations, examine their account position, and access bulletin board services. Such systems may also facilitate trading among buyers and sellers and support direct negotiation among parties.

Administration - Assistance to shippers with aspects of natural gas transfers, such as nominations and confirmations.

Compression - Provide compression needed to increase pressure of natural gas received off of a lower pressure system so that it can be transferred to a pipeline operating at a higher pressure. If needed additional compression is bundled with transportation, it is not a separate service.

Hub-to-Hub Transfers - Arranging simultaneous receipt of a customer's natural gas into a connection associated with one center and simultaneous delivery at a distant connection associated with another center.

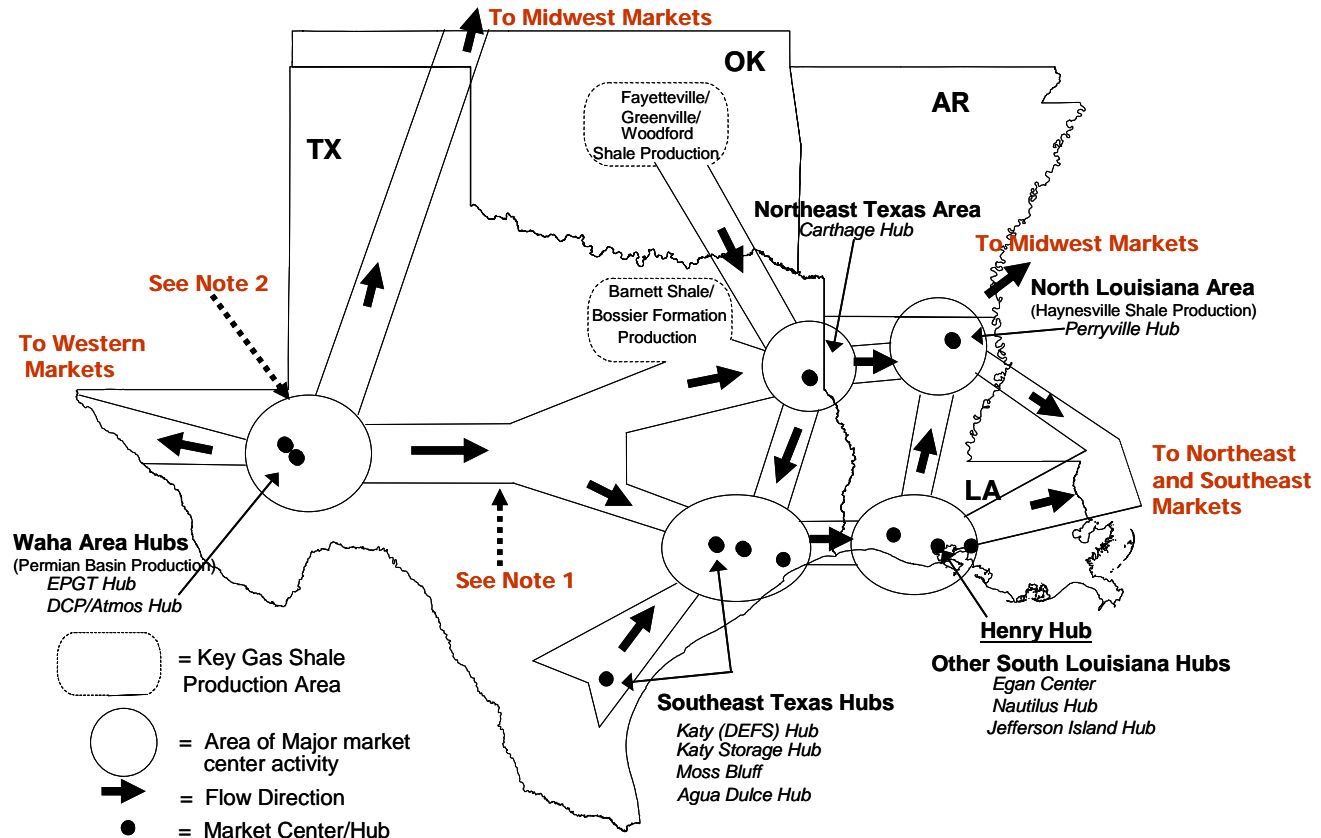
Transportation and title transfer remain the most important market center operations and services provided the customer. For instance, when a shipper with contracted capacity on one pipeline wants to deliver natural gas to an end user located off another pipeline, the shipper can make arrangements to transport the natural gas on the other pipeline through the market center administrator. If two parties consummate a trade through the market center, the administrator will handle the title transfer and other administrative details, including providing the operator of the center's pipeline facilities with the physical flow details involved in the deal.

Needed capacity on the receiving pipeline may be acquired at the center if trading services (or traders) are available. Similarly, the shipper can use the center's services to revise its nominations (or temporarily release some capacity) on either pipeline, with the center handling the administrative requirements, including confirmations, associated with the transactions. To cover any imbalances that might occur when the receipt/delivery volume exceeds nominated capacity on either pipeline, the shipper can execute an operational balancing agreement with the center.

When the shipper experiences a sudden increase in demand, the center may also provide the necessary incremental support from storage. If the shipper temporarily exceeds its storage allotment at the center, the center can offer natural gas loaning, with the shipper responsible for its replacement within a specified period. Similarly, storage withdrawal and loaning by the center can also be used to cover shortfalls when purchased production flowing into the downstream pipeline does not equal transportation nominations. Most centers provide a real-time tracking service to notify shippers immediately when such imbalances are imminent.

Market centers require pre-approved credit and/or proven creditworthiness of their potential customers and normally operate under standardized contract provisions. The advantage of a standardized contract is that it is well understood and so minimizes transaction costs and provides a clear understanding of legal responsibilities. Pre-approved credit and/or creditworthiness support the ease of trading and finalization of contracts.

Figure 4. Concentrations of Natural Gas Market Center Activities in Texas and Louisiana, 2008



DCP = DCP Midstream LP; EPGT = Enterprise Products Texas Pipeline Company.

Note 1: Corridors shown are illustrative only and are not intended to reflect actual pipeline capacity or flow levels.

Note 2: Some flows out of the San Juan Basin, destined for California, Arizona, and north and east Texas, are directed through the Waha area hubs.

Source: Energy Information Administration, Office of Oil and Gas, Natural Gas Division, Natural Gas Market Hubs Database, December 2008.

informal operations were often referred to as the Greasewood Hub and the Meeker Hub, but they were not market centers (see box, “Trading and Price Reporting”).

Although its business location is in northern New Mexico, the Blanco Hub, operated by Transwestern Gas Pipeline Company, is a primary provider of market center services to pipelines and producers flowing natural gas production from the portion of San Juan Basin located in southwestern Colorado. While natural gas production in southwest Colorado decreased 11 percent between 2003 and 2007, the area still represents more than 30 percent of the State’s overall annual natural gas production.¹³ Natural gas production in the New Mexico portion of the San Juan Basin also decreased 11 percent during that period.

Despite this decrease in production in the area and no additional interconnections being installed, activity at the Blanco Hub grew during the period, with estimated daily throughput showing a 41-percent increase and receipt/delivery capability growing 22 percent (Table 2).

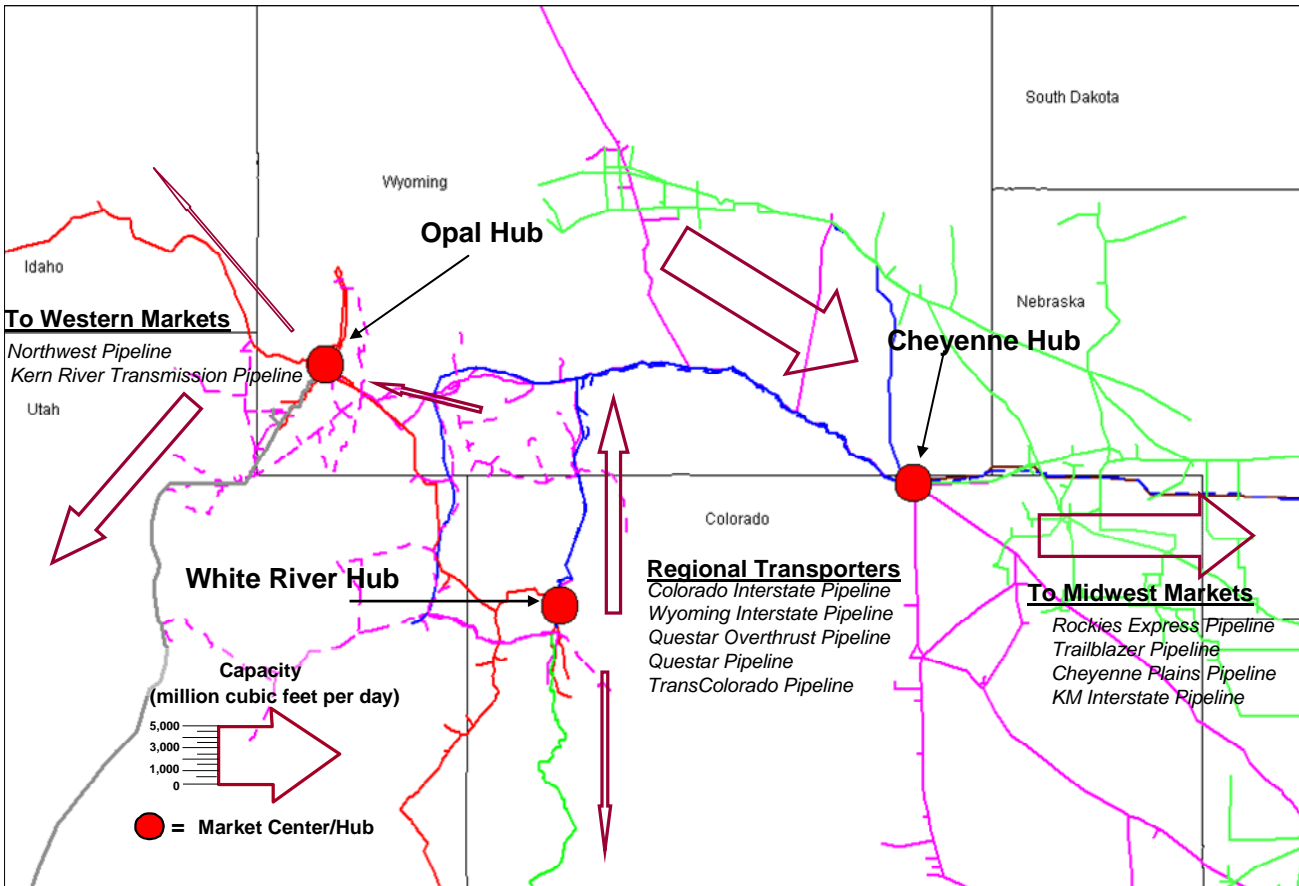
¹³Based on data in “Colorado - Top Five Producing Counties.” See footnote 11.

One reason for this increase in market center activity is that the Blanco Hub is a destination point for the TransColorado Gas Transmission pipeline system. This pipeline extends 300 miles from the Greasewood area (White River Hub) of northwest Colorado (Piceance Basin) to a point of interconnection with El Paso Natural Gas, Transwestern, and Southern Trails interstate pipelines at the Blanco Hub.

Western Regional Centers

In the Western Region, activities at the three existing market centers grew primarily because of increases in interconnect capacity and number (Figure 1). The California Energy Hub, operated by Southern California Gas Company, was the only market center in the region to see a significant increase in estimated daily throughput volume, up 64 percent (Table 2). The California Energy Hub also experienced a major increase (47 percent) in interconnect capability as two new interstate pipelines became associated with the market center: the North Baja Pipeline system and Questar’s Southern Trails Pipeline system. Several additional interconnection locations along the existing interstate system

Figure 5. Rocky Mountain Natural Gas Hubs and Target Markets, 2008



Source: Energy Information Administration, Office of Oil and Gas, Natural Gas Division, Natural Gas Market Hubs Database, December 2008.

as well as several new intrastate production receipt points also were added to its venue. In addition, between 2003 and 2007 natural gas deliveries into southern California increased by at least 6 percent,¹⁴ providing support for expansion of the California Energy Hub.

The other two market centers in the Western region, the Gas Transmission Northwest (GTNW) Market Center and the PG&E Golden Gate Market Center, saw only limited growth during the period (Table 2). This minimal growth reflects the stabilization of natural gas pipeline capacity originating in western Canada, which serves the west coast of the United States, primarily California. Since 2003, the decrease in natural gas shipments along this route has negated the need for new pipeline capacity. Indeed, over the 5-year period, deliveries of natural gas into northern California were between 545 and 600 Bcf per year, whereas in the prior 5 years, annual flows were in the range of 640 to 680 Bcf. Nonetheless, the two market centers did manage to

experience a small increase in average daily throughput volumes.

The Sumas Center primarily supports the western U.S. natural gas market although its operational center is actually located in Canada near the British Columbia/Washington State border. It is a principal source for trading and transportation of Canadian natural gas flowing on the Northwest Pipeline Company system destined for the States of Washington, Oregon, and Idaho. The Sumas Center was the only market center that reported a decrease in average daily throughput volume over the period. However, it did experience a 10-percent increase in its customer base with two new pipeline interconnects and a 12-percent increase in interconnect capacity.

Midwest Regional Centers

The ANR Joliet Hub, located in northern Illinois, was the only one of the two market centers found in the Midwest Region that experienced any significant growth in its operations and transactions (Figure 1). Its average daily

¹⁴Energy Information Administration, *Natural Gas Annual(s)*, 2007- January 2009, DOE/EIA-0131 (Washington, DC), http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/natural_gas_annual/nga.html.

Trading and Price Reporting

While many of the market centers referred to in this report have names similar to a number of natural gas trading points reported on in the trade press or posted on electronic future or spot market boards, they are not related operations. Market centers themselves are not the source of the price or volumetric information reported by these entities, although they do not prohibit their customers from reporting their trading volumes and prices to the public. In many cases, they welcome such reporting since it publicizes the liquidity of the trading area or of the market center itself.

The volumes and prices publically quoted in the trade press are usually a compilation of trading activities carried out and reported by energy marketers, traders, and pipeline customers who agree to report any transactions they perform within a defined common trading area, to the publishers on a regular basis. Their incentive for doing so is that they recognize that this reporting by them and others helps to provide price transparency to the market and thereby a basis for future price setting. Spot and futures prices and volumes reported by the electronic trading platforms such as New York Mercantile Exchange (NYMEX), Intercontinental Exchange (ICE) or TradeSpark, among others, are based on trading activities held specifically on their platforms by their customers.

Because the trading volumes reported by non-market center parties include trading areas beyond the market center, even though the “center/hub” labels are the same or similar, the estimated average daily volume (Table 2) provided through the actual market center does not agree with that reported in the trade press or electronic platform. For instance, the daily trading volume for the “Henry Hub” reported in the trade press often currently exceeds 1,600 million cubic feet per day (MMcf/d) while that reported by the center’s administrator as running through the hub on a daily basis in 2008 was only about 900 MMcf/d.

While the primary business of a market center is the administrative processing and transporting of natural gas between interconnecting pipelines on behalf of traders and shippers, many market centers also provide their customers access to a proprietary Internet-based natural gas trading and nominations platform (Table 1). This service gives their customers the capability to transact much of their business with the market center online with relative ease. For instance, with it a shipper may quickly determine the amount of firm or interruptible capacity currently available through the center, submit nominations for available capacity, and then arrange for transportation of the gas.

In addition, many of these market center online platforms also offer anonymous natural gas trading support services. Customers are provided details of the transaction, bid and ask prices are communicated between parties, and when a deal is consummated, the market center administrator handles the title transfer and other administrative details, including providing the operator of the center’s pipeline facilities with the physical flow details involved in the deal.

throughput volume increased by one-half while its total interconnection capacity grew by 38 percent (Table 2). Four of the 10 natural gas pipelines that interconnect at the Joliet Hub, Alliance Pipeline, Natural Gas Pipeline Company of America (NGPL), NICOR (Northern Illinois Gas Company), and NIPSCO (Northern Indiana Gas Company) increased their access capacity. Though the NICOR Chicago Hub, the remaining market center in the region, added one more interconnection, its size was relatively small, and the reported average daily throughput volume since 2003 did not noticeably change.

Neither the Joliet nor the Chicago hubs currently provide their customers access to the newest large capacity pipeline traversing the Midwest region, the Rockies Express Pipeline system (REX). The REX system crosses the State of Illinois well to the south of these two centers. If and when either of the two centers provides access to REX it will be indirectly, perhaps through the NGPL Pipeline, which interconnects with the REX in northeast Nebraska and interconnects with both centers in northern Illinois.

Northeast Regional Centers

Only two market centers within the Northeast Region are currently operational, down from three in 2003. In 2005, the Ellisburg-Leidy Center, which served natural gas shippers delivering to markets in the New York and Pennsylvania areas, ended its operations. The National Fuel Gas Supply Company, a major regional interstate pipeline company and the administrator/operator of the Ellisburg-Leidy Center, cited a lack of trading activity and customers as the reasons for closing down the market center operation. Nonetheless, it continues to provide hub services within its normal pipeline system operations.

The Dominion Hub is the larger of the two remaining market centers in the region (Figure 1). It provides interconnections with 15 intrastate and interstate pipelines as well as two pooling points (Table 2), an addition of one interconnection since 2003. The market center uses the entire Dominion Transmission Company pipeline grid, which has operations in Pennsylvania, New York, and Ohio, to serve its customers. It also has access to the 15 storage fields located on the Dominion system.

A major operational area of the Dominion Market Center is the Leidy area of north central Pennsylvania, a region of major pipeline connectivity in the Northeast Region. A number of major interstate pipelines traverse the general area including the Tennessee Gas Pipeline, Texas Eastern Transmission Pipeline, and Transcontinental Gas Pipeline, all of which are interconnected through the Dominion Market Center. In fact, these three systems, which have undergone expansions in the region since 2003, account for three of the six interconnections at the Dominion Market Center that have increased in capacity between 2003 and 2008. Although seven of the interconnections at the Dominion Market Center were downsized during the period for various reasons, the net additions to interconnection capacity produced a 42-percent increase over the 5-year span (Table 2).

The other remaining market center in the Northeast region, the Iroquois Market Center provides shippers of primarily western Canadian natural gas with transportation and hub services between the New York/Canadian border and the New York metropolitan area (Figure 1). Between 2003 and 2007, it experienced a 47-percent growth in estimated average daily throughput volume, although the supporting pipeline system itself did not undergo any significant expansion during the period. A large user of line-packing to maximize its daily throughput, the Iroquois Pipeline system provides the market center operations with available space to support its parking, loaning, and operational balancing services.

The Iroquois Market Center provides access to only four interconnections besides its own supporting pipeline system. Since 2003, the only increase in interconnection capacity has been to add receipt capacity at one of the existing interconnects (Algonquin Pipeline).

Canadian Market Centers

Of the nine market centers currently operating in Canada, six are located in the Province of Alberta, which is the dominant gas production area in Canada (Figure 1). These centers, which provide Alberta natural gas producers and shippers with trading opportunities and interhub transportation between the TransCanada (Nova) Pipeline system and the rest of Canada, all indicated that there were no appreciable changes in operational capabilities or their status since 2003 (Table 2). One of the principal reasons for this static condition was that the TransCanada Pipeline's mainline system, which is the primary delivery interconnection, has actually decreased its overall system capacity between the Alberta border and eastern Canada because of lower shipper demand.

The TransCanada (Market) Center, which administers the hub services provided on the TransCanada Pipeline System between Alberta and eastern Canada, itself reported only a 2-percent change in its overall interconnect capacity, brought about by increases at several border points interconnecting with expanded U.S. pipeline systems.

Only the Dawn Market Center, located in eastern Ontario, Canada (Figure 1), reported a significant change in its operational status, with its estimated average daily throughput increasing more than 85 percent since 2003. Moreover, total interconnect capacity more than doubled at the Dawn facility (Table 2) though it only added one new interconnection in the past 5 years. Of the nine existing interconnecting pipelines at the Dawn Center, only one did not add interconnect capacity during the same period.

A major attraction of the Dawn Center has been its expanding underground storage base. Currently, the center has access to more than 150 Bcf of high-deliverability working gas storage capacity and 2 Bcf/d of storage withdrawal capability from its 18 storage pools, to serve its customers. And its location and interconnections along the TransCanada mainline, as well as its access to several major U.S. pipelines via Michigan, have made the Dawn Center convenient to both U.S. and Canadian natural gas shippers, contributing to its steady growth.

Over the past 5 years one of the major contributors to the growth of the Dawn Center has been the expanding use of the Vector Pipeline system. The Vector Pipeline system serves as a conduit for western Canadian natural gas that has been processed at the Aux Sable plant in Illinois and destined for eastern Canada via the Dawn Center. The Dawn Center also provides customers shipping natural gas through the Empress Hub, located at the Alberta border, with interhub transfer services between Alberta (production) and Ontario (storage), arranging transportation on the TransCanada Pipeline system (see box, "Market Center Services").

Outlook

While the number of market centers has not expanded significantly during the past 10 years, several new ones have been put in service located at strategic points on the pipeline grid. The latest, the White River hub located in western Colorado, can provide up to 2.6 Bcf/d of transportation service to producers, marketers, and shippers who need access to downstream markets for natural-gas volumes produced in the Piceance Basin.

Besides the six proposed natural gas market centers listed on Table 3, there are several areas of the country that have the

potential to accommodate new market center operations. For instance, with the expansion of the Rockies Express Pipeline through the Midwest, several major natural gas pipelines serving the northeast have made proposals to build new interconnections with the Rockies Express Pipeline, which is currently slated to end in the vicinity of Lebanon, in eastern Ohio.¹⁵

At least six major natural gas pipeline systems currently traverse the area around Lebanon, Ohio. Indeed, prior to 1998 the East Ohio Pipeline Company operated a natural gas market center, which accommodated interconnects with many of these pipeline systems. However, because of a lack of trading interest at the site, it was closed in the late 1990s. Nevertheless, with the development of the large capacity Rockies Express Pipeline, with its flow of Rocky Mountain and other new Central Region sourced natural gas, there is a good possibility a new market center could develop in the area.

Another area of potential market center development is in northern Louisiana. Currently, the Perryville Hub,

administered and operated by Centerpoint Energy Inc. is the only market center in the area (Figure 4). In 2007, an alternative to the Perryville Hub, the “Eagle Hub” was proposed by Lehman Brothers Partners Inc. However, because of the collapse of Lehman Brothers in 2008, and the sale of its natural gas assets to EDF Development Inc, the project has been put on hold. The original proposal recognized the potential need for another market center in the northern Louisiana area, which could be acted on by another party in the future, especially if natural gas production in the Barnett shale area of east Texas continues to expand and development of shale gas in the Haynesville formation in northern Louisiana takes place as anticipated.

Lastly, Enbridge Energy Partners LP, among others, has sought interest from area shippers in the possibility of creating additional market centers in the Carthage area of northeast Texas and in the Orange County area of southeast Texas, to accommodate production expansions. To date, however, not enough interest to open these new market centers has been found, but that may change in the future.

¹⁵The sponsors of the Rockies Express Pipeline have proposed extending the system as far east as New Jersey by 2010.