

E&P Stock Perspectives Per Underlying Commodity Price Drivers

Post Q4'12 Update: U.S. Natural Gas Production Is Projected To Be Flat In 2013 Despite Lower Spending By E&P Companies

■ Industry Overview

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- **Storage Withdrawal** – The EIA reported a 145 Bcf withdrawal from U.S. underground natural gas storage for the week ended 03/08/13, compared with a 66 Bcf withdrawal last year, a 56 Bcf withdrawal in 2011, and a 146 Bcf withdrawal the prior week. Storage is now at 1,938 Bcf, which equates to a 440 Bcf year-over-year deficit but a 198 Bcf surplus versus the five-year average.
- **Storage Analysis** – Last week's withdrawal was above Street consensus but essentially in line with our forecast. In the East Region, stocks were 38 Bcf above the 5-year average following net withdrawals of 92 Bcf. Stocks in the Producing Region were 85 Bcf above the 5-year average of 684 Bcf after a net withdrawal of 48 Bcf. Stocks in the West Region were 75 Bcf above the 5-year average after a net drawdown of 5 Bcf.
- **Temperatures Last Week** – Based on customer-weighted gas home heating degree days (HDDs), temperatures last week were ~39% colder than last year and ~20% colder than the ten-year average. With ~89% of the total weighted HDDs during a normal winter now in the books, temperatures have now been ~11% colder than last year but still ~3% warmer than the ten-year average.
- **Post Q4'12 Update On U.S. Natural Gas Production, E&P Spending Slates** – Post Q4'12 earnings, we have updated our outlook for the E&P sector's U.S. natural gas activity, spending and production outlook for 2013 (see our prior note: [Nov 21st Post Q3'12 Update](#)). Based on our projections for our 26-company E&P coverage group, which accounts for ~1/3 of total U.S. natural gas production, this group plans to reduce spending on U.S. natural gas directed drilling activity by ~30% (~\$3.0bn) to \$6.9bn in 2013. This accounts for ~2/3s of the total \$5.2bn (~7%) drop in total E&D budgets versus last year. Meanwhile, total U.S. natural gas production for this group is projected to decline by just ~1% year-over-year, primarily due to asset sales, without which gas volumes would be essentially flat. Further, our analysis of the top 45 U.S. natural gas producers, which account for a combined ~56% of domestic output, also reveals that total U.S. natural gas production is likely to be flat versus 2012 as strong growth from the Marcellus shale and liquids-rich plays offsets declining Haynesville and conventional volumes. In the Haynesville shale, which accounts for ~9% of total U.S. natural gas production, output is projected to decline by ~1.1 Bcf/d in 2013, largely driven by CHK and XCO. In the Barnett (~7% of U.S. total), production is projected to increase just ~0.1 Bcf/d as high uncompleted well counts offset lower activity levels by DVN, CHK and EOG. In the Fayetteville, SWN should drive a ~0.1 Bcf/d year-over-year uptick. In the Marcellus (~9% of U.S. total), we project that natural gas production will increase ~2.7 Bcf/d in 2013 as nearly every producer expects to grow volumes here despite lower spending.

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

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U.S. Natural Gas Production To Stay Flat Yr/Yr In 2013 Despite Reduced E&D Spending

Figure 1. Dry Gas vs. Total E&D Budget By Company

U.S. natural gas directed E&D spending by our E&P coverage group is projected to decline by ~30% yr/yr in 2013 vs. a ~7% drop in overall E&D spending...

	2012			2013E			Variance	
	"Dry Gas" Spending (\$MM)	Total E&D Budget (\$MM)	Dry Gas as % of Total	"Dry Gas" Spending (\$MM)	Total E&D Budget (\$MM)	Dry Gas as % of Total	Change in Budget Dry Gas	E&D
Anadarko Petroleum (APC)	550	6,506	8%	550	6,600	8%	0%	1%
Apache Corporation (APA)	400	8,800	5%	200	10,000	2%	-50%	14%
Canadian Natural Res. (CNQ)	0	6,372	0%	0	6,922	0%	NA	9%
Cabot Oil & Gas (COG)	575	958	60%	700	999	70%	22%	4%
Chesapeake Energy (CHK)	1,400	8,750	16%	840	6,000	14%	-40%	-31%
Cobalt International Energy (CIE)	0	600	0%	0	825	0%	NA	38%
Concho Resources (CXO)	0	1,515	0%	0	1,600	0%	NA	6%
Denbury Resources (DNR)	0	1,556	0%	0	1,000	0%	NA	-36%
Devon Energy (DVN)	900	7,195	13%	550	5,065	11%	-39%	-30%
EnCana Corp. (ECA)	1,242	3,450	36%	620	3,100	20%	-50%	-10%
EOG Resources (EOG)	700	6,730	10%	25	6,600	0%	-96%	-2%
Goodrich Petroleum (GDP)	23	251	9%	22	188	12%	-2%	-25%
Kosmos Energy (KOS)	0	458	0%	0	500	0%	NA	9%
Magnum Hunter (MHR)	25	360	7%	25	340	7%	0%	-6%
Matador Resources (MTDR)	0	313	0%	0	307	0%	NA	-2%
Newfield Exploration (NFX)	150	1,476	10%	0	1,800	0%	-100%	22%
Noble Energy (NBL)	350	3,682	10%	750	3,840	20%	114%	4%
Pioneer Natural Resources (PXD)	215	2,500	9%	185	2,300	8%	-14%	-8%
Quicksilver Resources (KWK)	248	340	73%	15	200	8%	-94%	-41%
Range Resources (RRC)	325	1,320	25%	200	1,300	15%	-38%	-2%
Rosetta Resources (ROSE)	0	676	0%	0	700	0%	NA	4%
Sandridge Energy (SD)	0	1,940	0%	0	1,550	0%	NA	-20%
Southwestern Energy (SWN)	1,579	1,861	85%	1,535	1,800	85%	-3%	-3%
Talisman Energy (TLM)	400	3,577	11%	300	3,000	10%	-25%	-16%
Ultra Petroleum (UPL)	820	820	100%	415	415	100%	-49%	-49%
Whiting Petroleum (WLL)	0	1,900	0%	0	1,790	0%	NA	-6%
Aggregate	9,902	73,906	13%	6,932	68,740	10%	-30%	-7%

Source: Citi Research

Figure 2. U.S. Natural Gas Production (MMcf/d)

...While total U.S. natural gas production for the group is projected to decline by just ~1% (but be flat accounting for asset sales last year), on average, in 2013 and to decline 1% from Q4'12 to Q4'13.

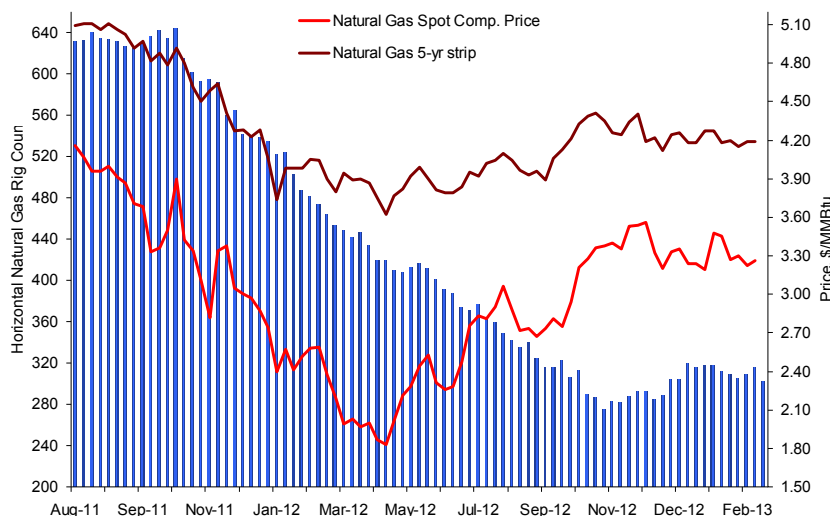
	Q1'12	Q2'12	Q3'12	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013
Anadarko Petroleum (APC)	2,416	2,544	2,499	2,521	2,495	2,597	2,545	2,494	2,444	2,519
Apache Corporation (APA)	817	844	863	891	854	889	888	890	888	889
Canadian Natural Res. (CNQ)	-	-	-	-	-	-	-	-	-	-
Cabot Oil & Gas (COG)	620	651	682	813	707	950	941	1,025	1,158	1,019
Chesapeake Energy (CHK)	2,976	3,027	3,286	3,046	3,084	2,924	2,866	2,837	2,809	2,859
Cobalt International Energy (CIE)	-	-	-	-	-	-	-	-	-	-
Concho Resources (CXO)	178	172	208	213	189	212	219	226	230	222
Denbury Resources (DNR)	28	29	31	28	29	27	28	28	28	28
Devon Energy (DVN)	2,072	2,050	2,067	2,029	2,054	1,948	1,938	1,928	1,928	1,936
EnCana Corp. (ECA)	1,779	1,565	1,606	1,540	1,622	1,463	1,390	1,334	1,281	1,366
EOG Resources (EOG)	1,062	1,070	1,022	981	1,034	917	899	881	863	890
Goodrich Petroleum (GDP)	82	74	65	50	70	55	60	62	64	60
Kosmos Energy (KOS)	-	-	-	-	-	-	-	-	-	-
Magnum Hunter (MHR)	49	43	34	35	43	44	45	46	46	45
Matador Resources (MTDR)	35	34	34	35	34	32	33	31	30	31
Newfield Exploration (NFX)	445	435	417	358	414	340	326	313	301	320
Noble Energy (NBL)	433	431	440	447	438	429	448	467	486	458
Pioneer Natural Resources (PXD)	369	373	376	395	378	391	388	386	384	387
Quicksilver Resources (KWK)	303	286	291	281	301	297	285	274	263	279
Range Resources (RRC)	512	575	623	655	601	675	725	750	795	737
Rosetta Resources (ROSE)	98	82	89	95	92	104	108	113	120	111
Sandridge Energy (SD)	173	241	295	312	256	306	297	302	305	302
Southwestern Energy (SWN)	1,466	1,508	1,568	1,628	1,547	1,683	1,733	1,790	1,855	1,766
Talisman Energy (TLM)	549	575	547	525	549	502	485	475	485	487
Ultra Petroleum (UPL)	732	693	665	635	678	633	631	629	627	621
Whiting Petroleum (WLL)	73	70	69	71	71	69	69	68	67	68
TOTAL	17,268	17,371	17,778	17,584	17,541	17,488	17,346	17,348	17,457	17,401

Yr/Yr 2013-12 -1%
Q4'13 - Q4'12 -1%

Source: Citi Research

Figure 3. U.S. Natural Gas Rig Count vs. Natural Gas Prices

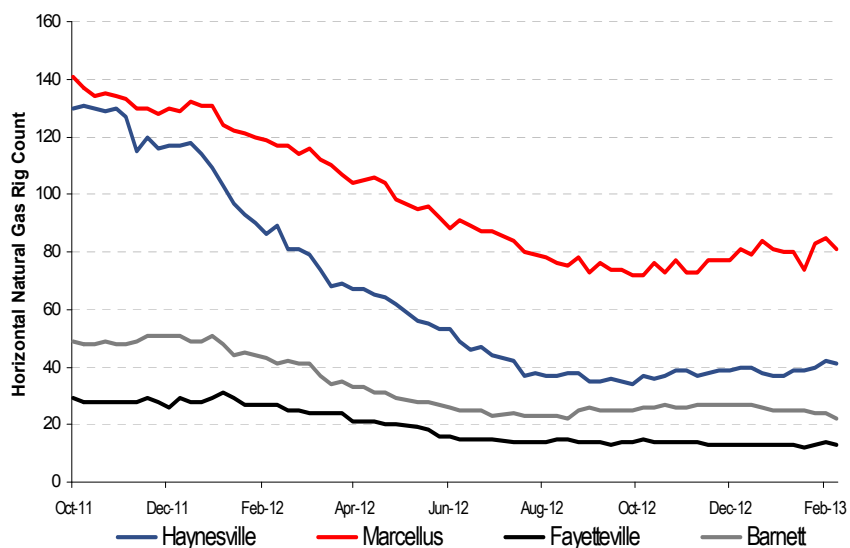
The domestic natural gas rig count began to decline in the fall of 2011 but has rebounded recently following a recovery in natural gas prices...



Source: Baker Hughes, Natural Gas Week, Citi Research

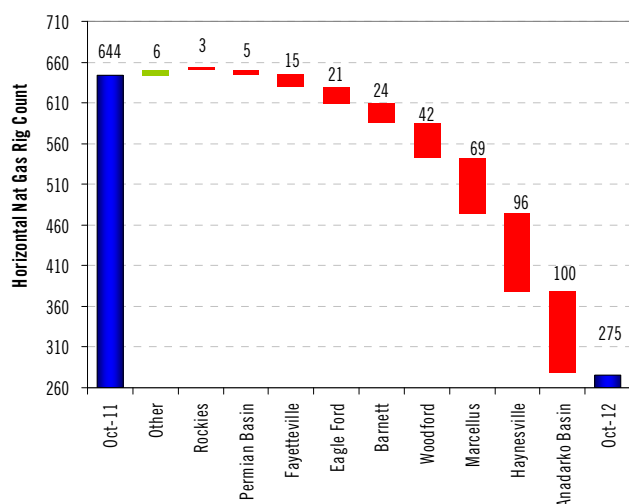
Figure 4. U.S. Natural Gas Rig Count By 'Dry' Gas Shale Play

...As rig counts in the four 'dry' gas plays (Haynesville, Barnett, Fayetteville and Northern Marcellus) appeared to bottom.



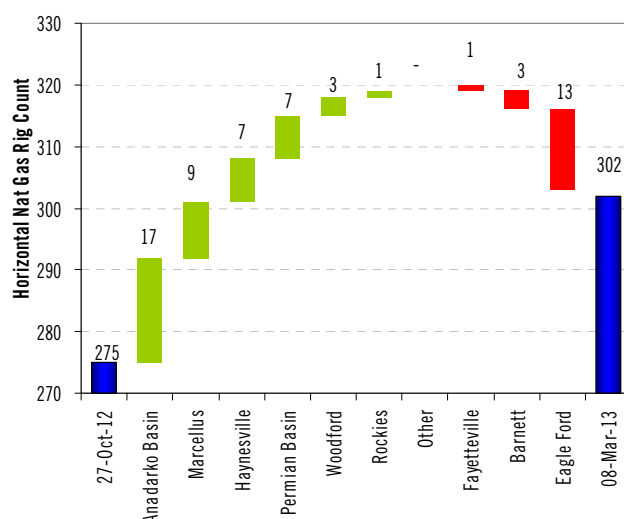
Source: Baker Hughes, Citi Research

Figure 5. U.S. Horizontal Rig Count Changes Between Peak in October 2011 and Low in October 2012



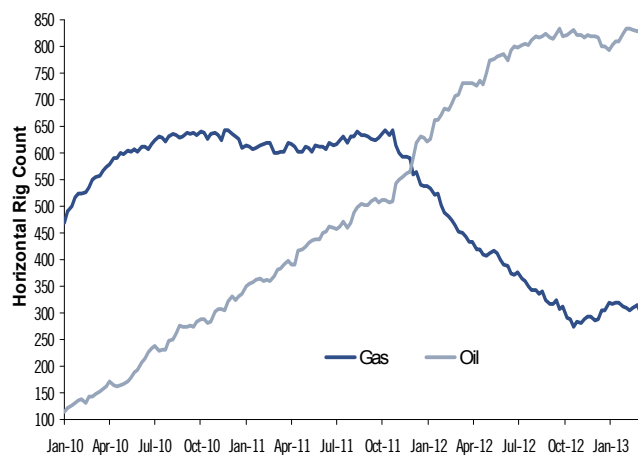
Source: Baker Hughes, Citi Research

Figure 6. U.S. Horizontal Natural Gas Rig Count Changes From Low in October 2012 Through March 2013



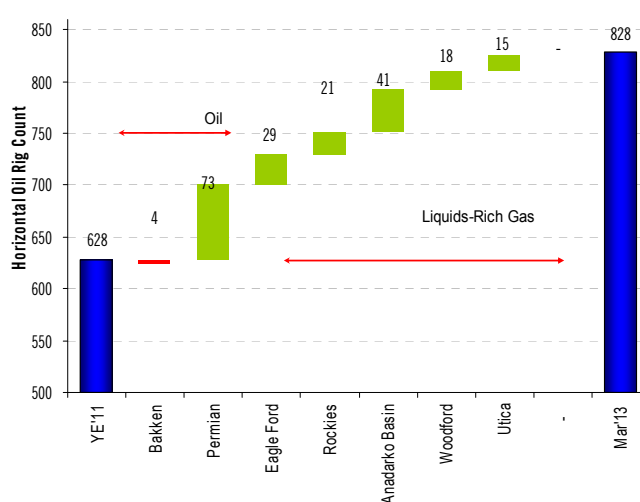
Source: Baker Hughes, Citi Research

Figure 7. U.S. Horizontal Natural Gas Rig Count vs. Oil Rig Count



Source: Baker Hughes, Citi Research

Figure 8. U.S. Horizontal Oil Rig Count Since YE'11



Source: Baker Hughes, Citi Research

Haynesville Shale Output Is Projected To Decline By ~1.1 Bcf/d (~17%) In 2013

Total Haynesville natural gas production is projected to decline by ~1.1 Bcf/d (~17%) yr/yr in 2013...

...While Q4'12 to Q4'13 output is projected to drop by ~1.2 Bcf/d (~19%).

The Haynesville shale accounts for ~9% of total U.S. natural gas production, with companies in our coverage group comprising ~3/4s of the region's output. Amidst ongoing weakness in domestic natural gas prices in an oversupplied U.S. market, producers slashed spending in the 'dry gas' Haynesville play, with total capex for our group declining by ~\$3.0bn (59%) in 2012 and is projected to drop ~\$0.7bn (32%) this year (see Figure 9). The average rig count in the play fell from an average of 80 in 2011 to 23 in 2012 with just 12 rigs running at the end of last year. **Chesapeake Energy** dropped 27 of its 29 rigs in the play at the beginning of last year and plans to run just 2 rigs in here going forward even if natural gas prices recover. Similarly, **Exco Resources** reduced its Haynesville rig count to just 3 rigs focused on 'manufacturing activity', down from a peak of 22 rigs in the play in 2011. On the other hand, **Encana** plans to ramp back up to 5 rigs in the Haynesville shale (from 0 in Q4'12) and allocate 10% of its full-year capital budget to the play, as it currently estimates "supply cost" for its "sweet spot" position at only ~\$2.50/MMBtu.

Thus, we estimate that gross Haynesville natural gas output for our study group declined by ~0.2 Bcf/d year-over-year in 2012 and should drop another ~0.8 Bcf/d in 2013. Assuming companies in our study group will comprise ~3/4s of the region's volumes this year, we project overall Haynesville production will decline ~1.1 Bcf/d (~17%), on average, this year after declining by ~0.3 Bcf/d (~5%) in 2012. This compares to a projected decline of ~1.2 Bcf/d (~18%) in our last update in November (see our November 21, 2012, note: [Natural Gas Weekly - Post Q3'12 Update: 2013 Dry Gas Spending To Slow Further, But Marcellus Should Drive Slight Natural Gas Production Uptick](#)). Meanwhile, total Haynesville gas output is projected to drop by ~1.2 Bcf/d (~19%) from Q4'12 to Q4'13. Notably, due to a lag between rig utilization and production response and an inventory of uncompleted wells, the brunt of last year's reduced drilling activity will be mostly felt this year.

Figure 9. Estimated Capital Budget and Operated Rig Count By Operator in the Haynesville Shale

Company	CapEx							Rigs										
	2011 (\$mm)	2012 (\$mm)	2013 (\$mm)	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)
Anadarko Petroleum (APC)	142	443	450	301	7	212%	2%	5	7	5	5	7	7	6	1	-1	8%	-8%
Chesapeake Energy (CHK)	1,917	650	240	(1,267)	(410)	-66%	-63%	2	5	2	2	2	2	2	-24	-3	-82%	-62%
EnCana Corp. (ECA)	1018	337	300	(681)	(37)	-67%	-11%	0	2	3	5	5	5	5	-13	3	-88%	186%
EOG Resources (EOG)	350	113	20	(238)	(93)	-68%	-82%	1	2	1	1	1	1	1	-5	-1	-68%	-56%
Exco Resources (XCO)	788	281	179	(507)	(102)	-64%	NA	4	7	3	3	3	3	3	-15	-4	-67%	-59%
Goodrich Petroleum (GDP)	140	22.5	22	(118)	(1)	-84%	-2%	0	0.17	0	0	0	0	0	0	0	103%	-100%
Plains Exploration (PXP)	216	128	155.84	(88)	28	-41%	NA	0	0	0	0	0	0	0	0	0	NA	NA
QEP Resources (QEP)	440	98	33	(342)	(65)	-78%	-66%	0	0	0	0	0	0	0	-1	0	-100%	NA
Total	5,011	2,072	1,400	(2,939)	(672)	-59%	-32%	12	23	14	16	18	18	17	(57)	(6)	-71%	-27%

Source: Company Guidance, Citi Research

Figure 10. Gross and Net Production By Operator in the Haynesville Shale

Company	Production - Gross (MMcfd)												Production - Net (MMcfd)											
	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)		
Anadarko Petroleum (APC)	256	208	256	263	269	275	266	58	58	38%	28%	205	166	205	210	215	220	213	46	47	38%	28%		
Chesapeake Energy (CHK)	2,764	2,962	2,585	2,417	2,259	2,113	2,343	7	(619)	0%	-21%	1,023	1,096	956	894	836	782	867	3	(229)	0%	-21%		
EnCana Corp. (ECA)	580	594	538	550	563	600	563	(41)	(32)	-6%	-5%	464	475	430	440	450	480	450	(33)	(25)	-6%	-5%		
EOG Resources (EOG)	153	165	150	138	125	113	131	(22)	(34)	-12%	-21%	122	132	120	110	100	90	105	(18)	(27)	-12%	-21%		
Exco Resources (XCO)	418	460	397	377	358	340	368	(140)	(92)	-23%	-20%	334	368	317	301	286	272	294	(112)	(74)	-23%	-20%		
Goodrich Petroleum (GDP)	45	53	45	63	65	63	59	(32)	6	-37%	10%	36	43	36	50	52	50	47	(25)	4	-37%	10%		
Plains Exploration (PXP)	204	219	179	158	139	125	150	(31)	(69)	-13%	-31%	163	175	143	126	111	100	120	(25)	(55)	-13%	-31%		
QEP Resources (QEP)	298	331	268	241	217	195	265	(38)	(66)	-10%	-20%	238	265	214	193	174	156	184	(30)	(80)	-10%	-30%		
Total	4,717	4,991	4,417	4,204	3,994	3,823	4,144	(239)	(847)	-5%	-17%	2,585	2,719	2,422	2,324	2,224	2,150	2,280	-194	-439	-7%	-16%		
Est. Haynesville Total Production	6,313	6,680	5,911	5,627	5,346	5,116	5,546	(320)	(1,134)	-5%	-17%													
% of Est. Haynesville Total Output	75%	75%	75%	75%	75%	75%	75%																	

Source: Company Guidance, Citi Research

Barnett Shale Gas Production Should Increase By ~0.1 Bcf/d (~2%) In 2013

Total Barnett natural gas production is expected to increase by ~0.1 Bcf/d (~2%), on average, in 2013...

...But with Q4'12 to Q4'13 volumes estimated to decline by 0.4 Bcf/d (~7%).

The Barnett shale comprises ~7% of total U.S. natural gas output, with companies in our study group accounting for ~2/3s of the region's volumes. Driven by ongoing weakness in domestic gas and NGL prices, producers limited their investment in the play, with total capex for our study group estimated to have declined by ~\$0.9bn (~31%) in 2012 and projected to fall another ~\$1.0bn (~50%) this year. Even **Devon Energy**, the play's largest producer which previously maintained that its liquids-rich content still provides favorable economics, now plans to drop 4 of its existing 10 rigs in the Barnett in 2013. At the time of our last update in November, Devon had expected to run all ten rigs through the year. Meanwhile, **Chesapeake Energy** expects to run just two rigs in the play this year, with most of its estimated \$240mm capex budget (down ~70% from 2011) to be allocated to well completions. **EOG Resources** intends to reduce dry gas spending and activity in the play to a minimum this year as most key acreage is now held by production (HBP).

However, we expect a lag between drilling and the production impact, slower-than-expected well decline rates and an uncompleted well inventory to contribute to both CHK's and DVN's average natural gas output growth this year. Thus, after rising by an estimated ~0.3 Bcf/d (~8%) in 2012, total gross gas output from the Barnett is projected to increase slightly by ~0.1 Bcf/d this year. Assuming our coverage group continues to account for ~2/3s of the play's overall volumes, we expect that total Barnett gas production will increase by ~0.1 Bcf/d (~2%) in 2013. This compares to forecasts of a ~0.2 Bcf/d (~4%) year-over-year decline in 2013 in our November analysis. Meanwhile, total Q4'12 to Q4'13 production from the Barnett is projected to decline by ~0.4 Bcf/d (~7%).

Figure 11. Estimated Capital Budget and Operated Rig Count By Operator in the Barnett Shale

	CapEx							Rigs											
Company	2011 (\$mm)	2012 (\$mm)	2013 (\$mm)	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)	
Chesapeake Energy (CHK)	780	250	240	(530)	(10)	-68%	-4%	2	4	2	2	2	2	2	(11)	(2)	-73%	-50%	
Devon Energy (DVN)	900	900	550	0	(350)	0%	-39%	10	10.5	10	8	6	6	7.5	(2)	(3)	-13%	-29%	
EOG Resources (EOG)	800	600	20	(200)	(580)	-25%	-97%	5	6.5	1	2	1	1	1	(5)	(5)	-41%	-81%	
Pioneer Natural Resources (PXD)	210	200	185	(10)	(15)	-5%	-8%	1	1.5	2	2	2	2	2	(1)	1	-25%	33%	
Quicksilver Resources (KWK)	272	95	30	(177)	(65)	-65%	-68%	0	1	1	1	1	1	1	(1)	0	-50%	0%	
Total	2,962	2,045	1,025	(917)	(1,020)	-31%	-50%	18	24	16	15	12	12	14	(19)	(10)	-44%	-31%	

Source: Company Guidance, Citi Research

Figure 12. Gross and Net Production By Operator in the Barnett Shale

	Production - Gross (MMcfd)											Production - Net (MMcfd)										
Company	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)
Chesapeake Energy (CHK)	1,047	884	1,041	1,031	1,010	980	1,016	246	132	39%	15%	733	619	729	722	707	686	711	172	92	39%	15%
Devon Energy (DVN)	1,456	1,454	1,441	1,412	1,384	1,356	1,512	87	58	6%	4%	1,062	1,061	1,052	1,031	1,010	990	1,103	63	42	6%	4%
EOG Resources (EOG)	450	488	450	450	450	450	450	(13)	(38)	-3%	-8%	360	390	360	360	360	360	360	(10)	(30)	-3%	-8%
Pioneer Natural Resources (PXD)	77	62	81	84	87	91	86	28	24	81%	38%	54	44	57	59	61	64	60	20	17	81%	38%
Quicksilver Resources (KWK)	382	416	354	329	306	287	319	(91)	(97)	-18%	-23%	254	276	235	218	203	191	212	(60)	(65)	-18%	-23%
Total	3,411	3,303	3,367	3,306	3,237	3,165	3,382	257	78	8%	2%	2,463	2,390	2,432	2,389	2,341	2,290	2,446	185	56	8%	2%
Estimated Barnett Total Production	5,600	5,422	5,526	5,427	5,314	5,195	5,551	422	129	8%	2%											
% of Est. Barnett Total Output	61%	61%	61%	61%	61%	61%	61%															

Source: Company Guidance, Citi Research

Fayetteville Output Should Grow ~0.1 Bcf/d (~5%) With SWN's High Grading Program

Total Fayetteville natural gas production is expected to increase by ~0.1 Bcf/d (~5%), on average, in 2013...

The Fayetteville shale accounts for ~4% of total U.S. natural gas production, with **Southwestern Energy** comprising the majority (~3/4s) of the play's overall output. After dropping to seven rigs in Q3'12 from twelve at the beginning of last year, SWN plans to maintain this rig count through this year, resulting in a projected ~16% year-over-year decline in spending to \$830mm (see Figure 13). Nonetheless, its net Fayetteville production is projected to increase by ~2% year-over-year in 2013 despite a royalty adjustment as its high grading program leads to improved well performance at lower costs. In the fourth quarter, SWN's average Fayetteville IPs rose to a record ~3.962 MMcf/d, up from ~3.857 MMcf/d in Q3'12. Also, the average drill time continued to decline to 5.7 vs. 6.8 days in Q3, while well costs averaged \$2.3mm in Q4 vs. \$2.6mm in Q3 as the company began operating with its own frac fleet in September.

...With Q4'12 to Q4'13 volumes estimated to also increase by ~0.1 Bcf/d (~2%).

As its average Fayetteville working interest declines to 61% from 64% last year, we project that SWN's net production from the region will grow by ~23 MMcf/d (~2%) in 2013 after increasing by ~133 MMcf/d (~11%) last year. Meanwhile, gross output is projected to increase by just under 100 MMcf/d (~5%) this year. Assuming Southwestern will continue to comprise ~3/4s of the play's production, we in turn expect overall Fayetteville natural gas production to increase by ~0.1 Bcf/d or ~5%, on average, in 2013. This equates to an increase of ~67 MMcf/d (~2%) from Q4'12 to Q4'13. This compares to a projected 2013 year-over-year increase of ~0.2 Bcf/d (~6%) estimated in our November 2012 note: [Natural Gas Weekly - Post Q3'12 Update: 2013 Dry Gas Spending To Slow Further, But Marcellus Should Drive Slight Natural Gas Production Uptick](#).

Figure 13. Estimated Capital Budget and Operated Rig Count By Operator in the Fayetteville Shale

Company	CapEx							Rigs										
	2011 (\$mm)	2012 (\$mm)	2013 (\$mm)	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)
Southwestern Energy (SWN)	1,347	991	830	(356)	(161)	-26%	-16%	7	7	7	7	7	7	7	(5)	0	-42%	0%
Total	1,347	991	830	-356	-161	-26%	-16%	7	7	7	7	7	7	7	(5)	0	-42%	0%

Source: Company Guidance, Citi Research

Figure 14. Gross and Net Production By Operator in the Fayetteville Shale

	Production - Gross (MMcf/d)											Production - Net (MMcf/d)										
Company	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)
Southwestern Energy (SWN)	2,191	2,144	2,242	2,242	2,242	2,242	2,242	215	98	11%	5%	1,360	1,330	1,353	1,353	1,353	1,353	1,353	133	23	11%	2%
Total	2,191	2,144	2,242	2,242	2,242	2,242	2,242	215	98	11%	5%	1,360	1,330	1,353	1,353	1,353	1,353	1,353	133	23	11%	2%
Est. Fayetteville Total Production	2,900	2,837	2,967	2,967	2,967	2,967	2,967	337	130	13%	5%											
% of Est. Fayetteville Total Output	76%	76%	76%	76%	76%	76%	76%															

Source: Company Guidance, Citi Research

Marcellus Natural Gas Production Is Projected To Grow By ~2.7 Bcf/d (~45%) In 2013

Total Marcellus natural gas production is projected to increase by ~2.7 Bcf/d (~45%), on average, in 2013...

...With Q4'12 to Q4'13 volumes estimated to climb by ~2.1 Bcf/d (~28%).

The Marcellus shale accounts for ~9% of total U.S. natural gas production, with companies in our study group comprising ~3/4s of the play's output. Even as some companies rein in spending in light of weak commodity prices with overall capex for the group slated to drop ~\$0.6bn (~10%) yr/yr, the play should be a significant driver of natural gas production growth this year. Improving drilling efficiencies, the shift to multi-pad drilling, a large uncompleted well inventory and infrastructure build out underscore this increase, offsetting the impact of the lower rig count. **Chesapeake Energy** plans to run just 5 Marcellus rigs this year, down from a peak of 29 rigs while working off its backlog of a "couple of hundred" drilled but uncompleted wells. Meanwhile, **Noble Energy** plans to add 3 Marcellus rigs as its JV with Consol enters full development mode, with average spending set to rise ~114% yr/yr.

After increasing by ~1.8 Bcf/d (~66%) this year, we project Marcellus total gross output for our study group will grow by ~2.1 Bcf/d yr/yr in 2013. Assuming companies in our study group will comprise ~3/4s of Marcellus volumes this year, we project overall Marcellus output will rise by ~2.7 Bcf/d (~45%), on average, in 2013. This is up from the projected ~1.9 Bcf/d (~31%) growth forecast from our last update in November as projections for nearly every company increased post Q4'12 results. Total Marcellus natural gas output is expected to grow by ~2.1 Bcf/d (~28%) from Q4'12 to Q4'13.

Figure 15. Estimated Capital Budget and Operated Rig Count By Operator in the Marcellus Shale

Company	CapEx								Rigs											
	2011 (\$mm)	2012 (\$mm)	2013 (\$mm)	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)		Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)	
Anadarko Petroleum (APC)	700	410	400	(290)	(10)	-41%	-2%		4	5	4	4	4	4	4	-2	-1	-29%	-20%	
Cabot Oil & Gas (COG)	585	525	700	(60)	175	-10%	33%		4	5	5	5	5	5	5	-1	1	-10%	11%	
Chesapeake Energy (CHK)	1,500	500	360	(1,000)	(140)	-67%	-28%		5	11	5	5	5	5	5	-19	-6	-64%	-52%	
EOG Resources (EOG)	200	200	20	0	(180)	0%	-90%		3	4	1	1	1	1	1	0	-3	-6%	-73%	
EQT Corp (EQT)	668	972	826	304	(146)	46%	-15%		6	8	6	6	6	6	6	-5	-2	-38%	-25%	
National Fuel Gas (NFG)	585	456	253.97	(129)	(202)	-22%	-44%		4	4	2	2	2	2	2	0	-2	0%	-50%	
Noble Energy (NBL)	32	350	750	318	400	994%	114%		3	2	3	4	5	6	5	2	3	NA	157%	
Range Resources (RRC)	1,424	1,376	1,040	(48)	(336)	-3%	-24%		6	10	8	8	7	7	8	-3	-2	-21%	-21%	
Southwestern Energy (SWN)	332	540	705	208	165	63%	31%		4	3	4	4	4	4	4	0	1	-8%	45%	
Talisman Energy (TLM)	1,200	350	150	(850)	(200)	-71%	-57%		1	3	1	1	1	1	1	-7	-2	-68%	-69%	
Ultra Petroleum (UPL)	600	336	231	(264)	(105)	-44%	-31%		0	0	0	0	0	0	0	0	0	-100%	0%	
Magnum Hunter (MHR)	45	25	25	(20)	0	-44%	0%		1	1	1	1	1	1	1	0	0	0%	0%	
Total	8,053	6,138	5,461	(1,895)	(585)	-24%	-10%		42	56	40	41	41	42	41	-37	-15	-40%	-27%	

Source: Company Guidance, Citi Research

Figure 16. Gross and Net Production By Operator in the Marcellus Shale

Company	Production - Gross (MMcfd)											Production - Net (MMcfd)										
	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)	Q4'12	2012	Q1'13	Q2'13	Q3'13	Q4'13	2013	Chg (2012-11)	Chg (2013-12)	Chg % (2012-11)	Chg % (2013-12)
Anadarko Petroleum (APC)	456	378	494	541	588	635	565	227	187	151%	49%	388	321	420	460	500	540	480	193	159	151%	49%
Cabot Oil & Gas (COG)	819	676	986	980	1,086	1,248	1,075	282	399	72%	59%	696	575	838	833	923	1,061	914	230	339	67%	59%
Chesapeake Energy (CHK)	1,231	906	1,329	1,422	1,508	1,583	1,461	295	555	48%	61%	800	589	864	924	980	1,029	949	192	361	48%	61%
EOG Resources (EOG)	130	102	133	135	138	141	137	36	35	54%	35%	65	51	66	68	69	70	68	18	18	54%	35%
EQT Corp (EQT)	646	487	663	749	824	891	782	223	295	85%	61%	549	414	564	637	700	757	664	190	251	85%	61%
National Fuel Gas (NFG)	245	184	233	208	176	150	192	68	8	59%	4%	209	156	198	176	150	127	163	58	7	59%	4%
Noble Energy (NBL)	255	192	224	291	393	480	347	66	155	52%	81%	121	91	106	138	187	228	165	31	74	52%	81%
Range Resources (RRC)	542	482	600	645	678	735	664	223	182	86%	38%	461	410	510	548	576	625	565	189	155	86%	38%
Southwestern Energy (SWN)	262	182	360	415	470	518	441	102	259	127%	142%	210	146	306	353	400	440	375	82	229	127%	157%
Talisman Energy (TLM)	475	514	447	420	400	400	490	104	(24)	25%	-5%	475	514	447	420	400	400	417	104	(97)	25%	-19%
Ultra Petroleum (UPL)	243	245	250	244	238	231	241	97	(5)	66%	-2%	194	196	200	195	190	185	192	78	(4)	66%	-2%
Magnum Hunter (MHR)	40	40	50	52	55	57	54	21	13	111%	32%	31	32	39	41	43	45	42	17	10	111%	32%
Total	5,505	4,532	5,769	6,103	6,553	7,069	6,591	1,800	2,059	66%	45%	4,232	3,523	4,558	4,794	5,117	5,507	5,023	1,395	1,500	66%	43%
Estimated Marcellus Total Production	7,244	5,964	7,590	8,030	8,622	9,301	8,673	2,324	2,709	64%	45%											
% of Est. Marcellus Total Output	76%	76%	76%	76%	76%	76%	76%															

Source: Company Guidance, Citi Research

Total U.S. Natural Gas Production Is Expected To Be Flat Year Over Year In 2013

Total U.S. natural gas production is projected to be flat yr/yr in 2013 based on data compiled for the top 45 U.S. producers, which comprise ~56% of total domestic natural gas production.

We project total U.S. natural gas production will be flat year over year in 2013, on average, as rising Marcellus production and associated gas from oil and liquids-rich plays will offset a drop in Haynesville output and natural declines from conventional production while Barnett and Fayetteville volumes tick up slightly. This is further confirmed by our analysis of the top 45 U.S. natural gas producers, which comprise ~56% of total domestic volumes. Based on our forecasts and Street consensus (for non-covered companies), we project total U.S. natural gas output for this group will be essentially flat year-over-year at ~40.6 Bcf/d (gross). Assuming this group is an accurate representation of the overall U.S. producer base, we project U.S. natural gas production will average ~72.9 Bcf/d in 2013 vs. the 2012 average of ~72.7 Bcf/d in 2012. This analysis matches our detailed top-down supply models based on overall rig efficiencies, decline rates and projected natural gas and oil rig counts.

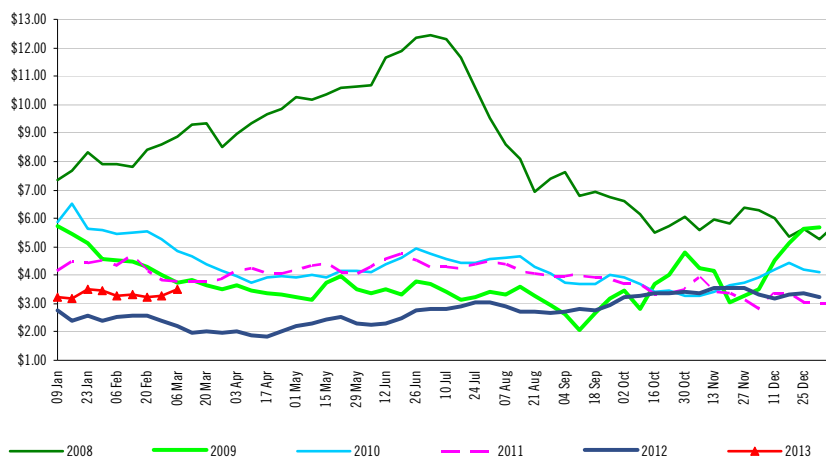
Figure 17. Top 45 U.S. Natural Gas Producers

U.S. Natural Gas Production (MMcf/d)														
Company	2011	Q1'12	Q2'12	Q3'12	Q4'12	2012	2012-11 Yr/Yr	Q1'13	Q2'13	Q3'13	Q4'13	2013	2013-12 Yr/Yr	Q4'13-Q4'12
1 ExxonMobil (XOM)	3,917	3,932	3,897	3,712	3,706	3,812	-3%	3,720	3,737	3,758	3,780	3,749	-2%	2%
2 Chesapeake Energy (CHK)	2,751	2,976	3,027	3,286	3,046	3,084	12%	2,924	2,866	2,837	2,809	2,859	-7%	-8%
3 Anadarko Petroleum (APC)	2,334	2,416	2,544	2,499	2,521	2,495	7%	2,597	2,545	2,494	2,444	2,519	1%	-3%
4 Devon Energy (DVN)	2,027	2,072	2,050	2,067	2,029	2,054	1%	1,948	1,938	1,928	1,928	1,936	-6%	-5%
5 BP Plc (BP)	1,907	1,883	1,705	1,598	1,648	1,708	-10%	1,800	1,800	1,800	1,800	1,800	5%	9%
6 EnCana Corp. (ECA)	1,879	1,779	1,565	1,606	1,540	1,622	-14%	1,463	1,390	1,334	1,281	1,366	-16%	-17%
7 Southwestern Energy (SWN)	1,368	1,466	1,508	1,568	1,628	1,547	13%	1,683	1,733	1,790	1,855	1,766	14%	14%
8 ConocoPhillips (COP)	1,616	1,561	1,516	1,554	1,541	1,543	-5%	1,515	1,485	1,470	1,455	1,481	-4%	-6%
9 Chevron Corp (CVX)	1,280	1,170	1,186	1,184	1,262	1,200	-6%	1,252	1,242	1,234	1,222	1,238	3%	-3%
10 WPX Energy (WPX)**	1,154	1,133	1,142	1,078	1,070	1,106	-4%	1,075	1,081	1,086	1,092	1,083	-2%	2%
11 Royal Dutch Shell (RDS)	1,000	1,087	1,031	1,045	1,251	1,104	10%	1,200	1,200	1,200	1,200	1,200	9%	-4%
12 EOG Resources (EOG)	1,114	1,062	1,070	1,022	981	1,034	-7%	917	899	881	863	890	-14%	-12%
13 Apache Corporation (APA)	865	817	844	863	891	854	-1%	889	888	890	888	889	4%	0%
14 Occidental Petroleum (OXY)	782	833	840	812	807	823	5%	802	798	796	791	797	-3%	-2%
15 Cabot Oil & Gas (COG)	490	620	651	682	813	707	44%	950	941	1,025	1,158	1,019	44%	42%
16 QEP Resources (QEP)**	648	654	703	701	666	681	5%	641	625	605	589	615	-10%	-12%
17 Ultra Petroleum (UPL)	649	732	693	665	635	678	5%	633	631	629	627	621	-8%	-1%
18 EQT Resources (EQT)	498	558	619	703	784	666	34%	824	880	926	976	902	35%	24%
19 Range Resources (RRC)	430	512	575	623	655	601	40%	675	725	750	795	737	23%	21%
20 Talisman Energy (TLM)	430	549	575	547	525	549	28%	502	485	475	485	487	-11%	-8%
21 Exco Resources (XCO)**	488	521	529	493	452	499	2%	421	390	379	367	389	-22%	-19%
22 Noble Energy (NBL)	388	433	431	440	447	438	13%	429	448	467	486	458	5%	9%
23 Newfield Exploration (NFX)	498	445	435	417	358	414	-17%	340	326	313	301	320	-23%	-16%
24 Pioneer Natural Resources (PXD)	333	369	373	376	395	378	14%	391	388	386	384	387	2%	-3%
25 Marathon Oil (MRO)	326	344	319	366	404	358	10%	345	311	310	310	319	-11%	-23%
26 Linn Energy (LINE)**	176	229	317	409	442	349	99%	447	455	501	513	479	37%	16%
27 SM Energy (SM)**	285	315	309	340	347	328	15%	356	363	370	381	367	12%	10%
28 Cimarex Energy (XEC)**	329	320	317	324	333	324	-2%	333	338	341	344	339	5%	3%
29 Quicksilver Resources (KWK)	335	303	286	291	281	301	-10%	297	285	274	263	279	-7%	-7%
30 Bill Barrett Corp (BBG)**	268	278	287	294	251	278	4%	172	165	157	149	161	-42%	-41%
31 SandRidge Energy (SD)	190	173	241	295	312	256	35%	306	297	302	305	302	18%	-2%
32 Plains Exploration & Production (PXP)**	306	234	235	255	242	242	-21%	284	274	263	253	268	11%	4%
33 Forest Oil (FST)**	242	230	229	225	202	221	-9%	165	140	133	128	142	-36%	-37%
34 Energen Resources (EGN)	196	210	212	205	208	209	6%	213	204	196	190	200	-4%	-9%
35 Concho Resources (CXO)	147	178	172	208	213	189	29%	212	219	226	230	222	17%	8%
36 National Fuel Gas (NFG)	141	153	155	196	223	182	29%	202	205	214	225	211	16%	1%
37 Continental Resources (CLR)**	101	154	178	184	182	175	74%	201	216	233	251	225	29%	38%
38 W&T Offshore (WTI)**	147	158	157	124	149	147	0%	159	156	152	150	154	5%	0%
39 Unit Corp (UNT)**	121	125	126	127	158	134	11%	156	156	153	152	154	15%	-4%
40 Stone Energy (SGY)**	108	110	115	116	125	116	8%	107	126	131	133	124	7%	6%
41 Hess Corp (HES)	99	100	118	99	100	104	5%	102	103	104	105	103	-1%	4%
42 Rosetta Resources (ROSE)	91	98	82	89	95	92	1%	104	108	113	120	111	21%	26%
43 MDU Resources (MDU)	125	110	91	80	82	91	-27%	77	74	71	69	73	-20%	-16%
44 Whiting Petroleum (WLL)	72	73	70	69	71	71	-3%	69	69	68	67	68	-3%	-5%
45 Goodrich Petroleum (GDP)	99	82	74	65	50	70	-30%	55	60	62	64	60	-13%	27%
Total	32,748	33,558	33,597	33,904	34,121	33,833	3%	33,953	33,762	33,826	33,974	33,869	0%	0%
Adjusting for Royalty	20%	39,297	40,270	40,317	40,685	40,946	3%	40,744	40,514	40,591	40,768	40,643	0%	0%
Lower 48 Natural Gas Production							72,700	73,100	73,000	72,600	73,000	72,900		
**Using FC Consensus							56%	56%	56%	56%	56%	56%		

Source: Citi Research

Composite spot natural gas cash prices have rebounded this winter and are now above last year's levels.

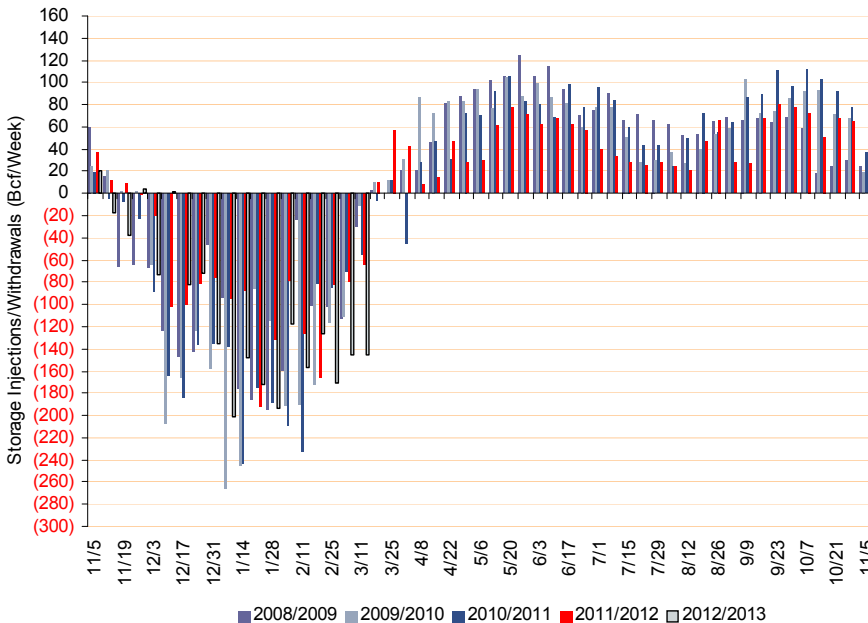
Figure 18. Composite Spot Natural Gas Price (\$/MMBtu)



Source: Citi Research

A 145 Bcf withdrawal from U.S. underground natural gas storage was reported last week...

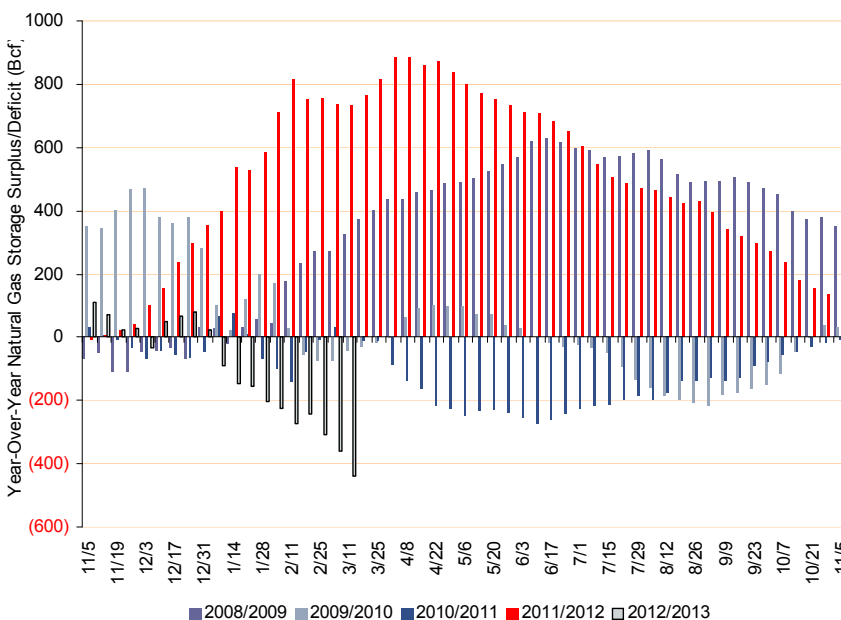
Figure 19. Natural Gas Storage Injections/Withdrawals



Source: Citi Research

Figure 20. Year-Over-Year US Underground Natural Gas Storage Surplus/Deficit

...While the year-over-year deficit is now at 440 Bcf.



Source: Citi Research

Figure 21. E&P Valuation and Comp Table Showing Production Growth and Natural Gas Production Mix

Company	Share Price 3/13/2013	Citi Rating	Target Price	EV/(DAFC)				Price/ NAV	MEV/Mcfe	Reserve/ Prod	Production Growth			% Prod N.Amer. Nat Gas	EBITDA/ Fixed Charges	Net Debt/Cap.		Reserve Replace. Eff. ⁽¹⁾
				2011	2012E	2013E	2014E				11/12E	12/13E	13/14E			2013E	2014E	
Anadarko Petroleum (APC)	83.94	Buy	105.00	6.8x	6.5x	6.0x	5.1x	80%	3.56	10.2	7.7%	5.2%	6.7%	54%	11.7x	29%	25%	2.0x
Apache Corporation (APA)	75.28	Buy	95.00	3.6x	4.2x	4.4x	3.9x	55%	2.08	11.0	4.1%	3.9%	6.1%	29%	74.6x	29%	27%	1.6x
Cabot Oil & Gas (COG)	65.76	Buy	69.00	23.3x	19.6x	12.0x	7.6x	258%	4.88	16.2	42.3%	46.3%	25.9%	95%	17.8x	26%	19%	2.2x
Chesapeake Energy (CHK)	21.40	Neutral(H)	20.00	6.3x	5.8x	5.9x	5.2x	54%	1.70	13.6	8.4%	(0.3%)	3.2%	73%	4.6x	43%	44%	1.7x
Cobalt International Energy (CIE)	26.26	Buy(H)	38.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N/A	N/A	NA
Concho Resources (CXO)	94.09	Buy	107.00	9.9x	9.4x	8.1x	6.8x	165%	5.42	16.3	25.6%	16.2%	14.7%	39%	8.2x	49%	45%	3.5x
Denbury Resources (DNR)	18.40	Neutral	18.00	6.5x	5.9x	6.8x	5.6x	99%	3.53	19.3	9.2%	(2.5%)	11.6%	7%	10.4x	25%	24%	3.7x
Devon Energy (DVN)	55.69	Neutral	55.00	4.1x	5.7x	6.2x	6.5x	107%	1.44	12.5	3.7%	(0.6%)	4.8%	57%	11.7x	21%	21%	2.0x
EOG Resources (EOG)	129.88	Buy	155.00	7.8x	6.8x	6.0x	5.0x	144%	3.21	13.3	10.3%	7.0%	7.0%	32%	32.5x	28%	25%	0.1x
Goodrich Petroleum (GDP)	14.70	Neutral	10.50	6.7x	6.5x	7.1x	6.1x	NM	2.46	12.5	(21.7%)	2.1%	13.4%	69%	3.0x	90%	94%	0.8x
Kosmos Energy (KOS)	11.17	Buy	15.00	9.2x	13.0x	8.9x	8.3x	154%	14.61	NA	NA	51.4%	17.0%	0%	15.6x	46%	50%	NA
Magnum Hunter (MHR)	3.91	Buy	5.00	22.5x	9.3x	6.4x	5.5x	71%	3.62	27.6	136.9%	52.4%	14.4%	38%	2.3x	49%	48%	NA
Marathon Oil (MRO)	34.37	Buy	33.00	5.0x	7.1x	5.8x	5.2x	116%	2.80	13.6	19.1%	5.5%	4.7%	12%	38.6x	19%	19%	3.9x
Matador Resources (MTDR)	8.02	Neutral (H)	10.00	11.2x	5.4x	5.9x	4.8x	95%	4.42	8.3	29.2%	8.0%	24.7%	53%	14.1x	47%	52%	NA
Newfield Exploration (NFX)	23.84	Neutral	27.00	4.2x	4.8x	4.7x	5.3x	59%	1.61	13.3	(0.5%)	(18.7%)	(9.8%)	43%	5.9x	50%	51%	1.4x
Noble Energy (NBL)	114.31	Buy	130.00	9.3x	7.9x	6.7x	5.3x	94%	3.36	15.6	12.4%	17.0%	16.8%	27%	14.7x	31%	27%	2.5x
Occidental Petroleum (OXY)*	83.28	Neutral	82.00	5.5x	6.4x	6.8x	6.6x	103%	3.44	12.7	5.8%	3.1%	3.0%	59%	67.8x	9%	9%	1.9x
Pioneer Natural Resources (PXD)	126.29	Buy	148.00	11.2x	10.0x	8.7x	7.3x	122%	2.97	25.0	28.5%	13.9%	14.9%	35%	10.7x	32%	33%	2.7x
Quicksilver Resources (KWK)	2.16	Neutral	2.00	4.9x	6.3x	8.2x	7.9x	173%	0.83	18.5	(12.7%)	(6.0%)	(4.8%)	82%	1.5x	247%	225%	1.0x
Range Resources (RRC)	79.75	Buy	76.00	17.7x	17.4x	15.6x	10.5x	228%	2.67	28.0	35.9%	24.5%	22.5%	78%	5.4x	60%	57%	4.0x
Rosetta Resources (ROSE)	49.24	Buy(H)	60.00	9.2x	7.2x	5.4x	4.2x	95%	3.04	16.0	34.6%	33.6%	19.9%	37%	24.4x	39%	32%	4.8x
SandRidge Energy (SD)	5.85	Neutral	7.00	9.1x	6.3x	5.8x	6.6x	106%	2.66	20.1	43.1%	2.0%	13.8%	54%	2.7x	52%	62%	1.1x
Southwestern Energy (SWN)	37.79	Buy	38.00	8.3x	9.4x	8.6x	6.6x	131%	2.46	11.8	12.7%	13.9%	10.3%	100%	19.9x	34%	27%	3.3x
Ultra Petroleum (UPL)	19.55	Neutral	18.25	5.1x	6.2x	9.1x	6.6x	116%	1.05	20.3	4.5%	(9.6%)	3.7%	97%	6.0x	127%	102%	2.0x
Whiting Petroleum (WLL)	50.92	Buy	52.00	5.8x	5.5x	5.2x	4.3x	71%	3.69	13.9	21.6%	13.7%	12.6%	12%	18.7x	40%	38%	3.1x
U.S. Group Average (Ex Hi-Lo)				8.5x	7.7x	7.0x	6.0x	114%	\$3.40	15.9	9.9%	5.6%	7.4%	49%	15.8x	44%	42%	2.3x
Canadian Natural Res. (CNQ)	31.14	Buy	37.00	6.5x	7.0x	6.1x	4.7x	94%	1.87	18.4	9.7%	5.3%	8.9%	27%	22.9x	31%	28%	5.9x
EnCana Corp. (ECA)	18.97	Neutral	20.00	3.9x	4.4x	6.5x	5.4x	158%	1.33	10.7	(8.6%)	1.6%	5.6%	90%	5.3x	48%	51%	1.5x
Talisman Energy (TLM)	12.09	Neutral	12.50	4.7x	5.1x	5.4x	5.1x	96%	2.30	8.0	0.1%	(8.7%)	0.8%	36%	12.8x	31%	33%	1.2x
Canadian E&P Average				5.0x	5.5x	6.0x	5.1x	116%	\$1.83	12.4	0.4%	2.0%	5.4%	51%	13.6x	37%	38%	2.8x
US & Canadian Average (Ex Hi-Lo)				8.1x	7.4x	6.9x	5.9x	114%	\$2.86	15.6	7.8%	5.0%	7.2%	49%	15.5x	43%	41%	2.4x

* Covered by Integrated Oil Analyst Faisal Khan

Source: Citi Research

Appendix A-1

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