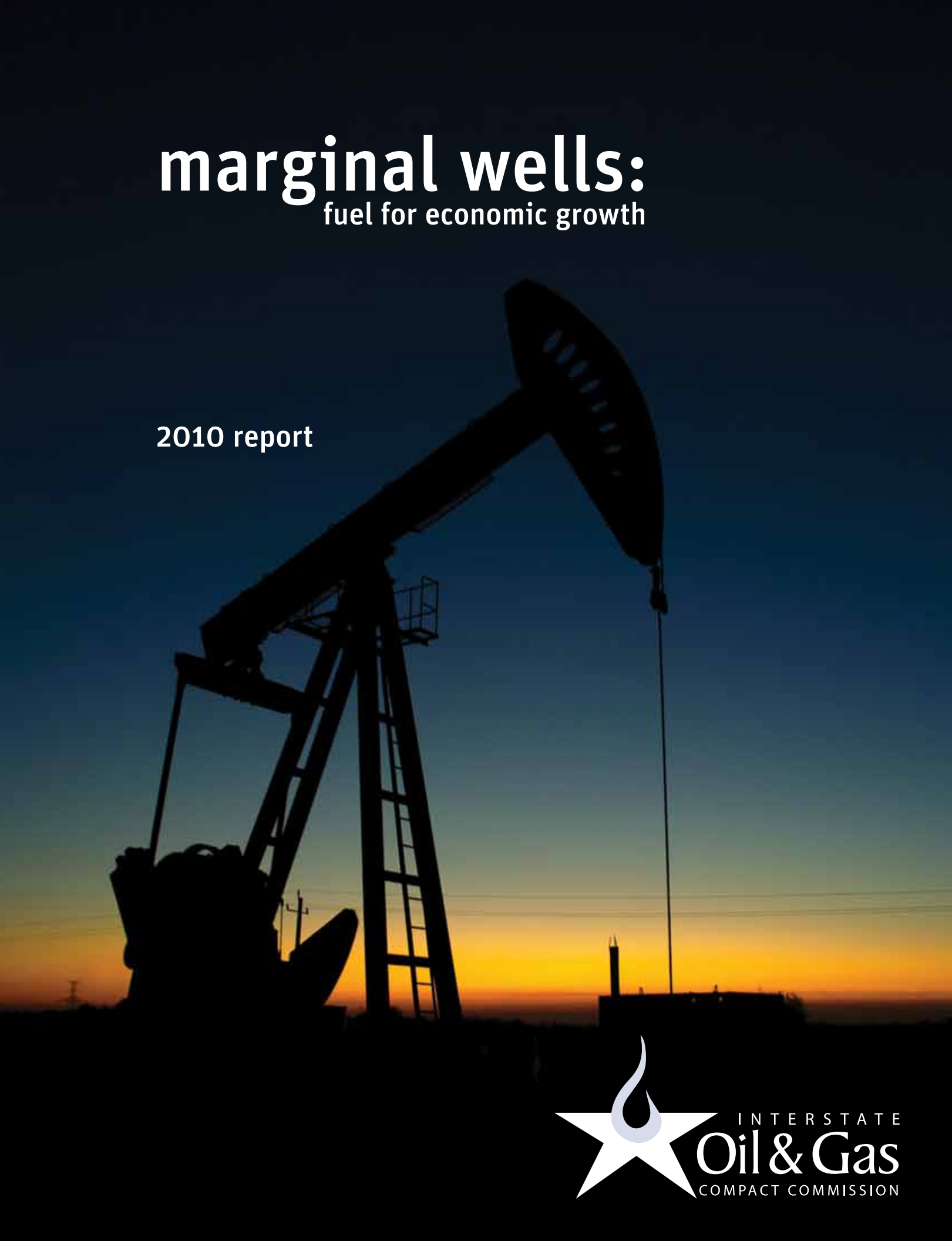
marginal wells:
fuel for economic growth

2010 report



INTERSTATE
Oil & Gas
COMPACT COMMISSION

about the interstate oil and gas compact commission

The Interstate Oil and Gas Compact Commission is a multi-state government agency that promotes the conservation and efficient recovery of our nation's oil and natural gas resources while protecting health, safety and the environment. The IOGCC consists of the governors of 38 states (30 members and eight associate states) that produce most of the oil and natural gas in the United States. Chartered by Congress in 1935, the organization is the oldest and largest interstate compact in the nation. The IOGCC assists states in balancing interests through sound regulatory practices. These interests include: maximizing domestic oil and natural gas production, minimizing the waste of irreplaceable natural resources, and protecting human and environmental health. The IOGCC also provides an effective forum for government, industry, environmentalists and others to share information and viewpoints, allowing members to take a proactive approach to emerging technologies and environmental issues. For more information visit www.iogcc.state.ok.us or call 405-525-3556.

marginal wells:
fuel for economic growth

2010 report

contents

introduction

introduction

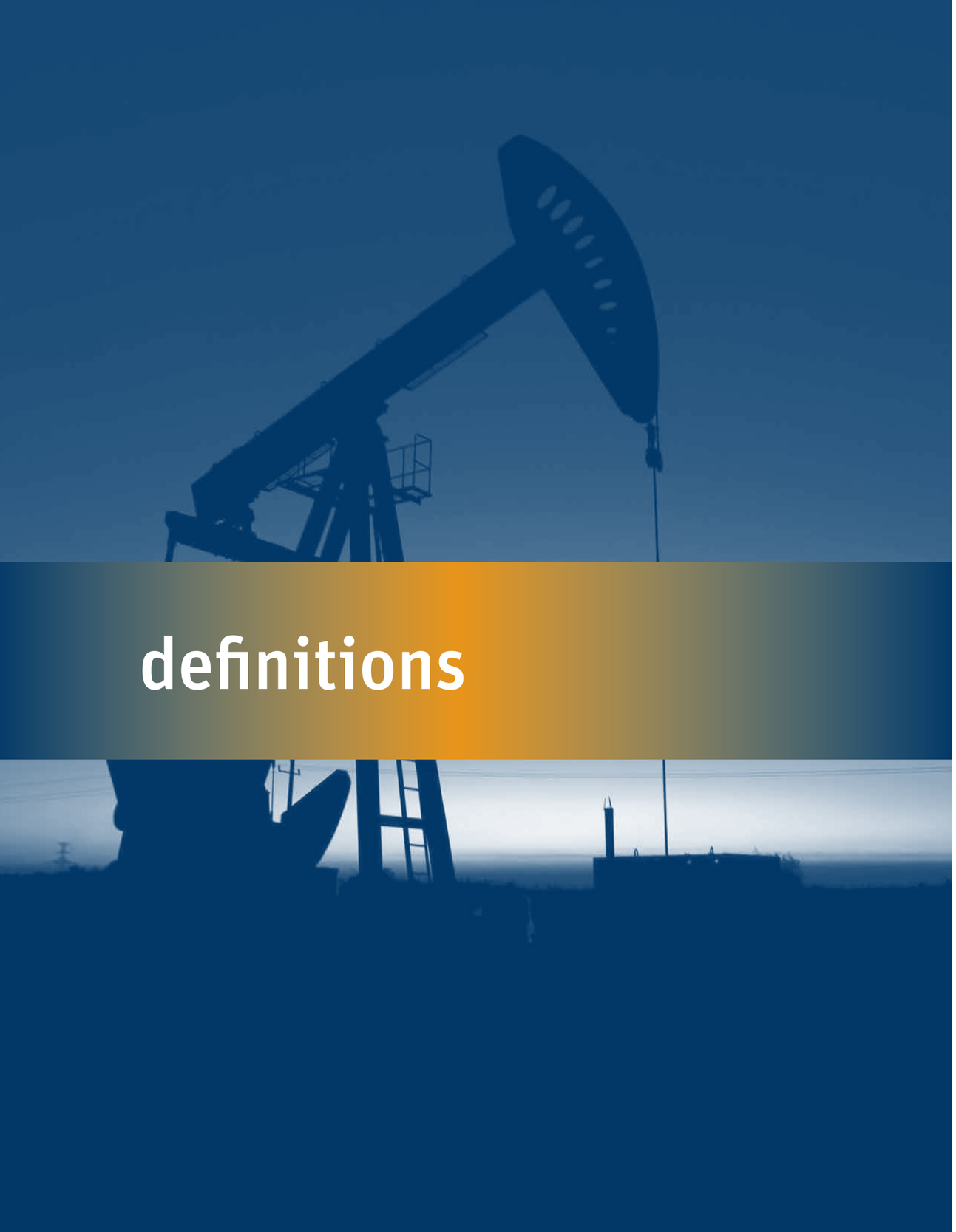
For more than 65 years, the Interstate Oil and Gas Compact Commission (IOGCC) has championed the preservation of this country's low-volume, marginal wells and documented their production. The IOGCC recognizes that it goes to the heart of conservation values to do all that is possible to productively recover the scarce oil and natural gas resources marginal wells produce.

The IOGCC defines a marginal (stripper) well as a well the produces 10 barrels of oil or 60 Mcf of natural gas per day or less. Generally, these wells started their productive life producing much greater volumes using natural pressure. Over time, the pressure decreases and production drops. That is not to say that the reservoirs which feed the wells are necessarily depleted. It has been estimated that in many cases marginal wells may be accessing a reservoir which stills holds two-thirds of its potential value.

However, because these resources are not always easily or economically accessible, many of the marginal wells in the United States are at risk of being prematurely abandoned, leaving large quantities of oil or gas behind.

In addition to supplying much-needed energy, marginal wells are important to communities across the country, providing jobs and driving economic activity.

Today, as the nation ponders the solution to its energy challenges, the commission continues to tell the story of how tiny producing wells can collectively contribute to a sound energy and economic future.



definitions

definitions

Marginal Well. A producing well that requires a higher price per MCF or per barrel of oil to be worth producing, due to low production rates and/or high production costs from its location (e.g. far offshore; in deep waters; onshore far from good roads for oil pickup and no pipeline) and/or its high co-production of substances that must be separated out and disposed of (e.g. saline water, non-burnable gasses mixed with the natural gas). A Marginal Well becomes unprofitable to produce whenever oil and/or gas prices drop below its crucial profit point. On land, this is often but not always a stripper well.

Stripper Well. An oil well whose maximum daily average oil production does not exceed 10 bbls oil per day during any consecutive 12 month period. Often used interchangeably with the term “Marginal Well”, although they are not the same.

Temporary Abandonment. “Cessation of work on a well pending determination of whether it should be completed as a producer or permanently abandoned.” (Williams & Meyers)

Idle Well. (1) A well that is not producing or injecting, and has received state approval to remain idle. or (2) a well that is not producing or injecting, has not received state approval to remain idle, and for which the operator is known or solvent. (IOGCC)

Plugged and Abandoned. Wells that have had plugging operations during the calendar year. Does not include wells that have been plugged back up-hole in order to kick the well, etc. This category does not necessarily exclude those with site restoration remaining to be completed.

marginal oil

marginal oil

National Marginal Oil Well Survey*
2009 Calendar Year

State	Number of Marginal Oil Wells	Production from Marginal Oil Wells (Bbls)	Average Daily Production Per Well (bls)	Total 2009 Oil Production (Bbls)
Alabama	693	951,704	3.8	7,190,384
Alaska	0	0	0.0	235,490,938
Arizona	16	19,637	3.4	46,193
Arkansas	4,547	3,005,944	1.8	5,780,663
California	31,984	40,702,381	3.5	229,903,041
Colorado	8,380	9,180,045	3.0	29,141,175
Florida	4	3,852	2.6	696,375
Illinois	26,649	9,500,000	1.0	9,500,000
Indiana	4,526	1,803,982	1.1	1,803,982
Kansas	18,061	15,563,714	2.4	39,465,000
Kentucky	25,259	2,579,940	0.3	2,608,635
Louisiana	19,969	18,554,005	2.5	69,002,744
Maryland	0	0	0.0	0
Michigan	2,290	3,046,215	3.6	5,538,572
Mississippi	954	881,198	2.5	23,324,558
Montana	2,640	2,006,412	2.1	27,836,080
Nebraska	1,463	1,434,068	2.7	105,295,511
Nevada	32	59,409	5.1	454,592
New Mexico	15,570	15,232,596	2.7	61,184,065
New York	3,339	323,536	0.3	323,536
North Dakota	1,532	2,310,151	4.1	1,645,919
Ohio	29,340	4,399,562	0.4	5,008,609
Oklahoma	33,967	21,389,976	1.7	53,411,573
Pennsylvania	19,307	3,600,000	0.5	3,600,000
South Carolina	0	0	0.0	0
Texas	134,602	108,067,592	2.2	349,101,603
Utah	1,775	2,775,796	4.3	23,061,807
Virginia	2	1,095	1.5	11,430
West Virginia	3,647	833,747	0.6	1,038,524
Wyoming	3,468	3,930,281	3.1	51,321,133
**Totals/Averages ** **	**394,202**	**275,409,538**	**2.6**	**1,344,483,434**

* Numbers are estimates by states, survey respondents are listed in acknowledgement section.
** Total represents only oil production from states with stripper wells.

us state rankings

Number of Marginal Oil Wells		Production from Marginal Oil Wells (Bbs)		Average Daily Production Per Well	
Texas	134,602	Texas	108,067,592	Nevada	5.1
Oklahoma	33,967	California	40,702,381	Utah	4.3
California	31,984	Oklahoma	21,389,976	North Dakota	4.1
Ohio	29,340	Louisiana	18,554,005	Alabama	3.8
Illinois	26,649	Kansas	15,563,714	Michigan	3.6
Kentucky	25,259	New Mexico	15,232,596	California	3.5
Louisiana	19,969	Illinois	9,500,000	Arizona	3.4
Pennsylvania	19,307	Colorado	9,180,045	Wyoming	3.1
Kansas	18,061	Ohio	4,399,562	Colorado	3.0
New Mexico	15,570	Wyoming	3,930,281	Nebraska	2.7
Colorado	8,380	Pennsylvania	3,600,000	New Mexico	2.7
Arkansas	4,547	Michigan	3,046,215	Florida	2.6
Indiana	4,526	Arkansas	3,005,944	Louisiana	2.5
West Virginia	3,647	Utah	2,775,796	Mississippi	2.5
Wyoming	3,468	Kentucky	2,579,940	Kansas	2.4
New York	3,339	North Dakota	2,310,151	Texas	2.2
Montana	2,640	Montana	2,006,412	Montana	2.1
Michigan	2,290	Indiana	1,803,982	Arkansas	1.8
Utah	1,775	Nebraska	1,434,068	Oklahoma	1.7
North Dakota	1,532	Alabama	951,704	Virginia	1.5
Nebraska	1,463	Mississippi	881,198	Indiana	1.1
Mississippi	954	West Virginia	833,747	Illinois	1.0
Alabama	693	New York	323,536	West Virginia	0.6
Nevada	32	Nevada	59,409	Pennsylvania	0.5
Arizona	16	Arizona	19,637	Ohio	0.4
Florida	4	Florida	3,852	Kentucky	0.3
Virginia	2	Virginia	1,095	New York	0.3
Alaska	0	Alaska	0	Alaska	0.0
Maryland	0	Maryland	0	Maryland	0.0
South Carolina	0	South Carolina	0	South Carolina	0.0
South Dakota	0	South Dakota	0	South Dakota	0.0

production from marginal oil wells (Bbls)

State	Production from Marginal Oil Wells (Bbls)
Texas	108,067,592
California	40,702,381
Oklahoma	21,389,976
Louisiana	18,554,005
Kansas	15,563,714
New Mexico	15,232,596

comparative number of marginal oil wells and marginal oil well production 2005-2009

	2005		2006		2007		2008		2009	
State	Number of Marginal Wells	Production from Marginal Wells (Bbls)	Number of Marginal Wells	Production from Marginal Wells (Bbls)	Number of Marginal Wells	Production from Marginal Wells (Bbls)	Number of Marginal Wells	Production from Marginal Wells (Bbls)	Number of Marginal Wells	Production from Marginal Wells (Bbls)
Alabama	665	911,785	677	917,537	693	1,009,557	680	1,009774	693	951,704
Arizona	17	31,432	20	30,469	15	17,721	16	22,514	0	0
Arkansas	4,000	3,317,410	4,000	3,162,057	4,102	3,150,508	4,123	3,075,053	16	19,637
California	26,444	35,563,813	28,016	37,503,478	29,460	39,280,587	31,255	40,600,275	4,547	3,005,944
Colorado	5,982	7,001,499	6,480	7,259,935	6,866	7,170,856	4,289	3,734,540	31,984	40,702,381
Florida	NR	NR	NR	NR	2	3,987	12	28,426	8,380	9,180,045
Illinois	16,751	10,040,292	15,700	9,441,470	25,629	10,000,000	25,635	9,000,000	4	3,852
Indiana	5,364	1,594,296	4,943	1,737,763	5,130	1,263,630	4,355	1,672,479	26,649	9,500,000
Kansas	38,692	25,827,950	54,200	27,417,150	17,020	14,542,290	17,791	15,316,817	4,526	1,803,982
Kentucky	19,012	1,958,015	20,000	1,796,536	18,618	1,796,536	18,576	2,178,114	18,061	15,563,714
Louisiana	20,041	14,152,725	19,338	13,453,243	19,547	19,931,314	16,102	11,779,256	25,259	2,579,940
Michigan	2,011	2,657,497	2,145	2,826,374	2,205	3,044,541	2,315	3,089,050	19,969	18,554,005
Mississippi	1,858	895,452	1,858 /	895,452 /	1,302	1,192,175	1,000	1,094,205	0	0
Missouri	495	85,406	323	86,780	326	79,515			2,290	3,046,215
Montana	2,424	1,947,855	2,505	2,011,555	2,532	2,017,196	2,645	2,085,300	954	881,198
Nebraska	1,478	1,598,224	1,487	1,579,404	1,473	1,634,975	1,471	1,644,062	2,640	2,006,412
Nevada	NR	NR	NR	NR	33	59,203	37	58,863	1,463	1,434,068
New Mexico	14,069	14,065,576	14,552	14,361,916	14,975	14,832,271	15,385	15,235,619	32	59,409
New York	2,553	211,292	2,793	293,651	3,559	386,887	3,442	397,060	15,570	15,232,596
North Dakota	1,416	2,217,706	1,457	2,309,795	1,471	2,370,729	1,509	2,406,132	3,339	323,536
Ohio	28,828	4,840,874	28,915	4,805,142	29,120	4,522,244	29,255	5,076,571	1,532	2,310,151
Oklahoma	46,798	39,318,486	47,153	30,258,650	45,892	27,911,928	34,985	23,799,316	29,340	4,399,562
Pennsylvania	16,662	3,652,770	17,350	3,626,000	18,200	3,600,000	19,093	3,600,000	33,967	21,389,976
South Dakota	27	54,169	27	54,169	30	63,054	27	47,993	19,307	3,600,000
Tennessee	290	235,127	347	126,956	347	126,956	0	0	0	0
Texas	124,116	139,959,142	130,553	147,506,457	130,106	119,683,522	132,297	107,160,693	134,602	108,067,592
Utah	1,163	1,618,810	1,407	1,817,620	1,412	2,271,425	1,611	2,638,738	1,775	2,775,796
Virginia	3	1,233	3	779	3	1,698	3	1,402	2	1,095
West Virginia	7,900	1,300,000	3,668	970,802	3,897	838,947	3,617	679,134	3,647	833,747
Wyoming	12,357	8,281,804	12,464	8,245,343	12,572	8,263,340	4,063	4,196,568	3,468	3,930,281
TOTALS	**401,072**	**321,761,570**	**422,381**	**324,496,483**	**396,537**	**291,067,592**	**375,589**	**261,627,954**	**394,016**	**275,409,538**

* Numbers are estimates by states, survey respondents are listed in acknowledgement section
/ no data submitted for 2006, 2005 data used
NR - No response, new to this portion of the survey

marginal gas

marginal gas

National Marginal Natural Gas Well Survey
2009 Calendar Year

	Number of Marginal Wells	Production from Marginal Gas Wells (Mcf)	Average Daily Production Per Well (Mcf)	Total 2009 Gas Production (Mcf)
Alabama	4,111	44,241,046	29.5	279,450,843
Alaska	0	0	NA	138,390,252
Arizona	2	19,442	26.6	711,787
Arkansas	2,448	23,566,824	26.4	678,558,507
California	730	5,579,765	20.9	301,229,054
Colorado	12,605	122,056,931	26.5	1,544,180,823
Florida	0	0	NA	291,331
Illinois	716	180,000	0.7	0
Indiana	520	4,927,163	26.0	4,927,163
Kansas	16,820	167,761,611	27.3	359,280,000
Kentucky	18,722	290,908,001	42.6	300,214,655
Louisiana	10,531	84,396,916	22.0	1,519,241,260
Maryland	7	43,584	17.1	43,584
Michigan	7,616	88,462,111	31.8	147,397,417
Mississippi	1,587	12,241,310	21.1	95,868,782
Montana	5,440	35,401,640	17.8	105,295,511
Nebraska	334	2,582,986	21.2	2,734,828
Nevada	0	0	NA	4,488
New Mexico	13,247	116,039,736	24.0	1,397,259,641
New York	6,424	14,015,245	6.0	44,848,895
North Dakota	169	1,232,507	20.0	1,751,877
Ohio	34,547	72,498,491	5.7	88,824,419
Oklahoma	28,744	333,199,823	31.8	1,660,340,609
Pennsylvania	56,178	199,052,000	9.7	273,868,000
South Carolina	0	0	NA	0
South Dakota			NA	10,908,621
Texas	49,038	389,000,000	21.7	7,665,909,932
Utah	1,925	19,728,150	28.1	449,472,239
Virginia	1,340	10,754,506	22.0	140,737,866
West Virginia	47,020	219,247,100	12.8	265,474,505
Wyoming	5,929	45,173,845	20.9	2,537,932,976
Totals/Averages	**287,229**	**2,148,624,539**	**19.8**	**20,015,149,865**

* Numbers are estimates by states, survey respondents are listed in acknowledgement section

us state rankings

Number of Marginal Gas Wells		Production from Marginal Gas Wells (Mcf)		Average Daily Production Per Well	
Pennsylvania	56,178	Texas	389,000,000	Kentucky	42.6
Texas	49,038	Oklahoma	333,199,823	Michigan	31.8
West Virginia	47,020	Kentucky	290,908,001	Oklahoma	31.8
Ohio	34,547	West Virginia	219,247,100	Alabama	29.5
Oklahoma	28,744	Pennsylvania	199,052,000	Utah	28.1
Kentucky	18,722	Kansas	167,761,611	Kansas	27.3
Kansas	16,820	Colorado	122,056,931	Arizona	26.6
New Mexico	13,247	New Mexico	116,039,736	Colorado	26.5
Colorado	12,605	Michigan	88,462,111	Arkansas	26.4
Louisiana	10,531	Louisiana	84,396,916	Indiana	26.0
Michigan	7,616	Ohio	72,498,491	New Mexico	24.0
New York	6,424	Wyoming	45,173,845	Virginia	22.0
Wyoming	5,929	Alabama	44,241,046	Louisiana	22.0
Montana	5,440	Montana	35,401,640	Texas	21.7
Alabama	4,111	Arkansas	23,566,824	Nebraska	21.2
Arkansas	2,448	Utah	19,728,150	Mississippi	21.1
Utah	1,925	New York	14,015,245	California	20.9
Mississippi	1,587	Mississippi	12,241,310	Wyoming	20.9
Virginia	1,340	Virginia	10,754,506	North Dakota	20.0
California	730	California	5,579,765	Montana	17.8
Illinois	716	Indiana	4,927,163	Maryland	17.1
Indiana	520	Nebraska	2,582,986	West Virginia	12.8
Nebraska	334	North Dakota	1,232,507	Pennsylvania	9.7
North Dakota	169	Illinois	180,000	New York	6.0
Maryland	7	Maryland	43,584	Ohio	5.7
Arizona	2	Arizona	19,442	Illinois	0.7
Alaska	0	Alaska	0	Alaska	
Florida	0	Florida	0	Florida	
Nevada	0	Nevada	0	Nevada	
South Carolina	0	South Carolina	0	South Carolina	
South Dakota		South Dakota		South Dakota	

production from marginal gas wells (Mcf)

State	Production from Marginal Gas Wells (Mcf)
Texas	389,000,000
Oklahoma	333,199,823
Kentucky	290,908,001
West Virginia	219,247,100
Pennsylvania	199,052,000
Kansas	167,761,611

comparative number of marginal gas wells and marginal gas well production 2005-2009

State	2005 Number of Marginal Wells	2005 Production from Marginal Wells (Mcf)	2006 Number of Marginal Wells	2006 Production from Marginal Wells (Mcf)	2007 Number of Marginal Wells	2007 Production from Marginal Wells (Mcf)	2008 Number of Marginal Wells	2008 Production from Marginal Wells (Mcf)	2009 Number of Marginal Wells	2009 Production from Marginal Wells (Mcf)
Alabama	2,620 **	26,757,739**	3,069 **	30,156,913 **	3,359 **	35,753,795**	3,751	40,353,899	4,111	44,241,046
Arizona	2	17,212	3	43,494	3	28,470	3	19,202	2	19,442
Arkansas	2,114	18,707,824	2,188	18,700,000	2,018	23,851,578	2,224	22,067,600	2,448	23,566,824
California	527	4,428,540	566	4,505,285	618	5,087,304	678	5,463,835	730	5,579,765
Colorado	8,861	88,788,233	9,599	94,485,949	10,740	102,321,123	25,826	280,104,854	12,605	122,056,931
Illinois	551	184,000	551 /	184,000 /	730	184,000	720	180,000	716	180,000
Indiana	2,110	3,134,583	479	1,460,491	450	1,802,991	667	2,350,691	520	4,927,163
Kansas	15,120	283,712,000	13,868	178,670,000	15,110	141,869,241	16,487	155,826,509	16,820	167,761,611
Kentucky	16,618	82,323,314	17,500	91,500,000	16,618	84,669,314	17,479	101,362,982	18,722	290,908,001
Louisiana	10,035	42,130,824	9,942	52,154,475	10,226	44,410,061*	5,742	50,402,837	10,531	84,396,916
Maryland	7	36,468	8	20,878	10	39,613			7	43,584
Michigan	6,003	77,388,412	6,448	80,800,000	7,080	80,800,000	7,567	88,228,804	7,616	88,462,111
Mississippi	1,226	9,486,746	1,226 /	9,486,746 /	1,123	9,729,948	1,192	10,690,535	1,587	12,241,310
Montana	4,162	27,426,557	4,577	28,935,586	4,926	31,373,986	5,093	34,123,251	5,440	35,401,640
Nebraska	108	720,360	109	823,851	190	1,233,935	281	2,522,377	334	2,582,986
New Mexico	10,858	97,358,159	11,433	101,488,431	12,267	105,336,679	12,844	111,383,175	13,247	116,039,736
New York	5,607	9,896,329	5,516	10,170,315	6,066	11,411,681	6,272	12,041,408	6,424	14,015,245
North Dakota	68	401,057	88	691,183	135	1,181,897	161	1,234,700	169	1,232,507
Ohio	33,355	68,267,000	33,576	71,382,588	33,960	67,630,326	34,412	75,014,485	34,547	72,498,491
Oklahoma	18,706 **	169,439,950**	20,528 **	184,790,656 **	22,038 **	195,509,065**	28,062	329,693,635	28,744	333,199,823
Pennsylvania	46,654	151,651,000	49,750	156,705,000	52,700	152,200,000	55,681	165,576,000	56,178	199,052,000
South Dakota	50	399,891	50	399,891	63	399,907	63	363,030		
Tennessee	315	2,200,000	298	1,792,984	298	1,792,984				
Texas	37,396	302,083,547	40,099	320,508,067	45,119	373,718,449	46,234	372,260,611	49,038	389,000,000
Utah	1,419	14,429,074	1,587	15,962,409	1,797	17,781,462	1,808	17,530,476	1,925	19,728,150
Virginia	285	3,651,691	357	2,404,616	482	3,625,593	372	2,611,817	1,340	10,754,506
West Virginia	40,900	186,000,000	43,336	158,446,233	44,420	165,994,559	41,123	109,832,150	47,020	219,247,100
Wyoming	23,221 **	89,043,042**	27,249	99,649,661	29,614 **	103,854,785**	7,765	58,696,937	5,929	45,173,845
TOTALS	**288,898**	**1,760,063,552**	**304,000**	**1,716,319,702**	**322,160**	**1,763,592,746**	**322,507**	**2,049,935,800**	**287,229**	**2,148,624,539**

* Estimated
** Includes natural gas from coal seams
/ no data submitted for 2006, 2005 data used

economic analysis

economic impact of marginal wells in the United States calendar year 2009

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Oklahoma City University

Marginal or stripper wells produce less than 10 barrels of oil per day or less than 60,000 cubic feet of gas per day. The Interstate Oil and Gas Compact Commission (IOGCC) has monitored production from these wells since the 1940s. While individual wells contribute only a small amount of oil (about 2.4 barrels per day nationally in 2009), there were more than 394,000 of these wells in the United States in 2009. This is about a 5 percent increase from the previous year's number of stripper oil wells. Combined, these marginal wells produced more than 275 million barrels of oil in 2009 – about 20 percent of U.S. production[1]. Marginal gas wells numbered more than 287,000 in 2009 (a 10 percent decline from the prior year) and produced about 2.1 trillion cubic feet of natural gas (at an average of 19.8 mcf per day). This total was about the same as the previous year – about 11 percent of total U.S. production[2]. Clearly, production from marginal wells is a significant factor in the overall domestic energy picture.

The Energy Policy Act of 2005 provided little encouragement for producers of these marginal wells. This act allows royalty relief for production from federal lands. But this occurs only if prices fall below $15 per barrel or $2 per mmbtu – prices unlikely to occur even in these difficult economic times. According to the Energy Information Administration (EIA), average oil prices during 2009 were $61.65 (a decline of 38 percent from 2008) and $3.71 per mcf (a decline of 54 percent form 2008 averages). There is no consistent governmental incentive at the state level for these mainly small producers; primarily incentives are in the form of severance tax relief. Later in this report we show the economic impact of these wells on jobs and productivity in states and across the country.

Some states have enacted individual incentive programs intended to promote production from stripper wells, but there is no broad agreement regarding the necessity of these incentives. In the face of current crude oil and natural gas prices, many of these wells may be abandoned, and their contribution to domes-

1 According to IOGCC survey estimates for total oil production.
2 According to IOGCC survey estimates for total gas production.

tic production levels halted. Production from these wells is, by definition, marginal. As the country attempts to expand its level of energy independence and recovery from the economic downturn, small marginal well operators can supply jobs and boost tax revenues that increase many state budgets. The aggregate influence of these marginal wells is significant in terms of revenue, employment, and earnings. If the country wishes to expand its level of energy independence, these small operators can supply thousands of local jobs, and the tax revenues generated by production can assist many state budgets. The following is a summary of these benefits and potential losses.

development of the report

The IOGCC surveys its member states annually to acquire data related to marginal well production. While individual states report the same information, including production figures, number of wells, and types of wells, each state has its own approach for calculating these various measures. These approaches also may vary over time. Thus, while year-to-year comparisons of these reports are useful, the differences in data reporting and collection should be noted. Production figures, numbers of wells producing or abandoned, and other information gathered from this survey are used here. There are many other groups and government agencies that collect data related to the oil and gas industry, particularly pricing information. For that reason, this report uses sound statistical methodology where anomalies in collection practices exist. And for consistency in this report, we use the EIA pricing information[3].

Marginal production from either oil or natural gas occurs in 29 states from Alabama to Wyoming. Texas has more than 134,000 marginal oil wells and more than 49,000 marginally producing natural gas wells. Arizona, on the other hand, reported only 16 stripper oil wells and 2 natural gas wells that were producing marginally. Predictably, the state of Alaska reports no marginal wells of either kind.

hydrocarbon production by state

Table 1 contains information reported by each state relative to its total production[4]. According to surveys received by the IOGCC, total production in the U.S. for calendar 2009 was approximately 1.34 billion barrels of crude oil (about the same as last year) and 20 trillion cubic feet of natural gas (slightly higher than last year). Table 2 shows marginal oil and gas production by state for 2009. More than 275 million barrels of crude oil (a 5 percent increase from 2008) and 2.2 trillion cubic feet of natural gas (about the same as 2008) were produced by stripper wells in the various states. On average, these marginal wells produced 2.6 barrels of oil, with a low of 0.3 BOPD in Kentucky and a high of 8 BOPD from South Dakota wells. Natural gas production of 19.8 thousand cubic feet per day from stripper wells had an equally diverse range of production – 0.7 MCFPD in Illinois and 52.9 MCFPD in Mississippi.

impact of marginal oil and natural gas production on the U.S. economy

Economic impact studies generally examine the direct and indirect effects of new businesses or industries entering local, state, or regional markets. For example, if a new *Bass Pro Shop* moved into a city, what effect on local demand, salaries, and employment might that occurrence have on the city's economy? Obviously the new firm would hire additional people, pay new salaries and generate new revenues for the city. But because those new employees would buy things from other existing businesses in the area and the new company would purchase supplies from local businesses, the *Bass Pro Shop* would have additional indirect effects on the economy of in that area. Economists call these multiplier effects. For purposes of this report, we measure these multiplier effects using RIMS (Regional Industrial Multiplier System) II multipliers provided by the Department of Commerce's Bureau of Economic Analysis.

The RIMS II multipliers, which are used to quantify the economic impact of the marginal gas and oil well abandonments, are listed in Table 3. These values are taken from last year's report. Holding price levels constants, these multipliers represent the regional economic impact that results from a change in demand, which, in this case, is the revenue lost from abandonment. The final demand multipliers for output, earnings, and employment that are shown include not only effects for the oil and gas industry, but secondary and supporting industries as well. Examples of these secondary industries may include, but are not limited to, items such as healthcare and retailers. Please refer to the Appendix below for a more thorough discussion of the multiplier concept.

A simple way of looking at the significance of marginal wells to United States domestic production is to examine the impact of stripper wells actually abandoned during 2009. Table 4 shows these results. There were more than 5,000 stripper oil wells abandoned with a market production value of more than $306 million[5]. Additionally, there were about 3,500 marginal gas wells abandoned during the time having a value of almost $96 million. The total value of all marginal wells abandoned in the U.S. in 2009, therefore, totals almost half a billion dollars – a significant economic impact, particularly at the state level. The abandonment of stripper wells is reflected in lower state revenues from severance taxes, lower profits to firms in the states and higher levels

3 We use the annual average EIA reported WTI spot price FOB Cushing, OK for oil and average wellhead prices for natural gas. For crude oil, that price was $61.65 during 2009; natural gas was $3.71 per mcf.

4 Note that this report is based on survey-reported numbers by state agencies and may not match other data sources such as the EIA. Also, some states did not report production for 2009

5 This assumes that each abandoned well produced at the state's average marginal well rate for the year.

economic impact of stripper production - 2009

OVERALL EFFECT IN FINAL DEMAND - STRIPPER OIL

OIL & GAS INDUSTRY

State	Value of Stripper Oil Production Millions $	Final Demand Multipliers Output	Final Demand Multipliers Earnings	Final Demand Multipliers Employment	Lost Output Million $	Lost Earnings Million $	Lost Employment	Direct Effect Multipliers Earnings	Direct Effect Multipliers Employment	Lost Earnings Million $	Lost Employment
California	2,509	1.99	0.43	9.52	4,991	1,084	23,899	0.18	3.45	450	8,659
Colorado	566	2.06	0.43	8.64	1,167	245	4,888	0.17	1.89	97	1,067
Kansas	944	1.95	0.38	14.11	1,838	358	13,326	0.17	6.96	163	6,574
Louisiana	1,144	1.83	0.36	8.82	2,096	415	10,087	0.16	2.33	180	2,662
Mississippi	54	1.60	0.30	9.32	87	16	506	0.15	3.84	8	208
New Mexico	939	1.66	0.35	10.03	1,555	327	9,422	0.17	3.74	161	3,514
North Dakota	142	1.74	0.35	10.99	248	50	1,565	0.17	4.53	25	645
Oklahoma	1,319	2.04	0.42	11.47	2,690	557	15,123	0.18	3.11	233	4,107
Texas	6,662	2.09	0.43	8.43	13,893	2,887	56,193	0.18	1.57	1,168	10,443
Utah	171	1.89	0.40	11.58	324	69	1,980	0.16	3.70	28	633
Wyoming	259	1.73	0.32	7.91	449	84	2,046	0.17	2.68	44	692
SUBTOTAL	14,710	2.03	0.42	9.30	29,898	6,243	136,803	0.18	2.56	2,587	37,658
ALL OTHERS*	2,269	2.03	0.42	9.30	4,612	963	21,102	0.18	2.56	399	5,809
TOTAL	**16,979**				**34,510**	**7,206**	**157,905**			**2,987**	**43,466**

OVERALL EFFECT IN FINAL DEMAND - STRIPPER GAS

OIL & GAS INDUSTRY

State	Value of Stripper Gas Production Millions $	Final Demand Multipliers Output	Final Demand Multipliers Earnings	Final Demand Multipliers Employment	Lost Output Million $	Lost Earnings Million $	Lost Employment	Direct Effect Multipliers Earnings	Direct Effect Multipliers Employment	Lost Earnings Million $	Lost Employment
California	21	1.99	0.43	9.52	41	9	85	0.18	3.45	4	71
Colorado	453	2.06	0.43	8.64	934	196	19,516	0.17	1.89	77	854
Kansas	578	1.95	0.38	14.11	1,125	219	3,090	0.17	6.96	100	4,025
Louisiana	313	1.83	0.36	8.82	574	114	1,002	0.16	2.33	49	729
Mississippi	114	1.60	0.30	9.32	182	35	321	0.15	3.84	17	436
New Mexico	431	1.66	0.35	10.03	713	150	1,506	0.17	3.74	74	1,611
North Dakota	5	1.74	0.35	10.99	8	2	18	0.17	4.53	1	21
Oklahoma	1,236	2.04	0.42	11.47	2,522	522	5,988	0.18	3.11	219	3,850
Texas	1,443	2.09	0.43	8.43	3,009	625	5,276	0.18	1.57	253	2,262
Utah	73	1.89	0.40	11.58	139	29	340	0.16	3.70	12	271
Wyoming	218	1.73	0.32	7.91	378	71	558	0.17	2.68	37	583
SUBTOTAL	4,884	2.03	0.42	9.30	9,926	2,073	19,276	0.18	2.56	859	12,502
ALL OTHERS*	3,088	2.03	0.42	9.30	6,276	1,310	12,187	0.18	2.56	543	7,904
TOTAL	**7,971**				**25,827**	**5,355**	**69,163**			**2,244**	**35,119**

ECONOMIC IMPACT OF 2008's STRIPPER WELL ABANDONMENT - OIL & GAS COMBINED

NATIONAL IMPACT IN FINAL DEMAND

OIL & GAS INDUSTRY

Oil	16,979	34,510	7,206	157,905	2,987	43,466
Gas	7,971	25,827	5,355	69,163	2,244	35119
TOTAL	**24,950**	**60,337**	**12,561**	**227,068**	**4,389**	**78,585**

***Weighted averages used for RIMS II Multipliers; excludes Alaska, Federal Offshore production.

of unemployment, particularly in the oil and natural gas industry. We examine some of these effects in the following analysis.

Another way of understanding the importance of stripper wells to the national economy is to examine the hypothetical scenario of abandoning all marginal wells. We show this in Table 4[6]. The losses, both in terms of production volumes and revenue, are staggering and serve to underscore the importance of marginal wells. If all marginal oil wells had been abandoned during 2009, this would have reduced domestic production by more than 275 million barrels of oil and would eliminate almost $17 billion of revenues. Likewise for natural gas, we see that production would be cut by 2.1 trillion cubic feet of natural gas, which corresponds to a loss of $8 billion in revenue.

Even more striking than the direct revenue effects of abandonment are those imputed to other industries' output, earnings, and employment levels. Nationally, the effect on secondary suppliers and others if these stripper wells were abandoned would result in total losses in industry income of $60 billion, lost earnings to employees of these firms of $12 billion, and potential lost employment of more than 227,000 jobs for those supporting the stripper well producers by acting as suppliers or local retailers selling to the firm's employees. In the oil and natural gas industry alone, actual abandonment of stripper wells could result in almost 79,000 job reductions and worker earnings (that could be spent on other goods and services locally or regionally) of almost $4.3 billion.

6 In Table 3, we show the largest hydrocarbon producing states, a subtotal from them and then all other states.

conclusion

Conclusion

According to the Energy Information Administration, the United States consumed 18.7 million barrels of crude oil per day during 2009. This report indicates that only 20 percent of U.S. consumption of oil is supplied by domestically producing wells. But of that domestic production, marginal oil wells represent 20 percent of the total – an important component of domestic energy policy. The EIA reports that consumption of natural gas in the U.S. during 2008 was slightly more than 20.9 trillion cubic feet (TCF). About 95 percent of consumption is produced domestically, and domestic marginal gas wells supplied about 11 percent of our country's production of this clean fuel.

Marginal well operations produce an economic ripple effect. Every million dollars directly generated by activity in this type of production results in more than $2 million of activity elsewhere in the economy as companies not linked directly to the industry benefit from the trickle down. Also notable is that each additional million dollars of production from these wells employs almost 10 workers directly and another 15 indirectly in some states.

Operations related to stripper wells remain an important part of the domestic oil and natural gas industry. Local and regional jobs are provided, state tax revenues are enhanced, and the national economy is improved. Every barrel of domestically produced crude oil is a barrel that does not have to be bought internationally from uncertain suppliers.

While both crude oil and natural gas prices have been declining recently, most economists see that as temporary. As long as supplies of these exhaustible resources remain tight relative to demand, inevitably prices will rise. And the more importance that can be given to domestic production of hydrocarbons, the less dependent the U.S. will be on foreign sources.

appendices

appendix – economic impact studies

Economists and planners typically have used economic impact studies to examine the effects that a new industry or event may have on local or regional economies. In this context, suppose a new factory or other manufacturing facility is contemplating moving into a region. To help determine the tax subsidies or other inducements that governmental authorities may be willing to offer the new business to locate in their area, economic analysis is used to predict the possible positive effects of job creation, enhanced future tax base, and other improved economic results of the arriving industry. With the anticipated rise in employment comes an increase in spending generally in the local area as workers in the imported facility purchase goods and services with their wages. But this new spending has an ultimate effect in the economy larger that its initial impact. As incumbent merchants sell their products to the recently arrived workers, they have additional income to spend with other local sellers, who then have additional disposable funds, and so on. As each round of spending works its way through the economy, some leakages occur when individuals do not consume all of the new earnings, but ultimately the impact of the new industry will be greater than the initial infusion of spending[7]. This phenomenon is known as the multiplier effect. One of the difficulties in this type of economic analysis is determining the appropriate multiplier.

Multiplier estimations for local economies generally have been based on three types of models: input-output, economic base, and regional income. Each of these approaches has distinct advantages and disadvantages. Depending on the situation being evaluated, either of these methods or a combination of them may be appropriate.

Input-Output models (I-O) appear to be the most reliable, and the most comprehensive, tool for local and regional economic analysis. In this model, an accounting framework called an I-O table is constructed for many industries showing the distribution of inputs purchased and the output sold. Multipliers are then developed for each industry and their interrelations are shown. The most accurate of these models is constructed using survey techniques that are costly and time consuming. Some efforts have been made to create short-cut methods (Drake 1976; Kuehn et al. 1985), but the reliability of non-survey I-O models has been questioned (Stevens and Trainer, 1976; Park et al., 1981; Kuehn et al., 1985).

In the economic base technique, multipliers are developed as ratios of total regional income or employment to income or employment in basic (or export) sectors (Olfert and Stabler, 1994). This approach

7 A simple multiplier can be calculated as the reciprocal of one minus the sum of a community's marginal propensity to consume (MPC). If a merchant receives an additional $100 and chooses to save 10% of it, then his MPC is .9. The merchant spends $90 somewhere in his community. If the person with whom the initial merchant spent his additional funds also saves 10%, then a third merchant has $81 to purchase additional goods and services. As this additional spending winds its way through the economy, the final effect of the beginning $100 on the local economy is 1/(1 - .9) = 10, the multiplier. In this example, an initial infusion of $100 will have a $1,000 effect on an economy.

is less costly than other methods, but also has been shown to be less accurate than other procedures. Other criticisms of this approach include questions about its theoretical underpinnings and doubts related to its application (Vias and Mulligan, 1997).

Regional income models can be constructed using published information or from a combination of survey data and published information (Archer, 1976; Thompson, 1983; Glasson et al., 1988; Rioux and Schofield, 1990). Researchers using this method estimate some general relationships from published data and then use survey data to focus on specific relationships. While this method keeps costs low, it still allows for some first-hand information to help estimate critical relationships used to calculate appropriate multipliers.

Almost all of these methods for calculating the multiple impact of a monetary infusion into an economy assume that an industry or event is not a part of the local or regional economy initially or that exports from a region create a flow of income into the region[8]. Whether by the construction of a new power plant, an autonomous increase in government spending, or the importation of a rock concert (Gazel and Schwer, 1997), it is the specific relationships between the new income and the incumbent economic actors that determine the specific multiplier effect. Because of the difficulty in determining an associative relationship, much less a causal one, between the spending patterns of various economic sectors, the validity of specific multipliers is highly speculative under any method. However, a common source for economic multipliers is the Department of Commerce's Bureau of Economic Analysis. As mentioned above, we use their RIMS II multiplier here for Industry 211000, Oil and Gas Extraction.

8 Examples of these studies are those examining the economic impact of universities on their communities. Here it is assumed that students from outside the region are imported into a school, bringing with them funds that would otherwise not be in the business community.

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abbreviations

frequently used abbreviations

Oil

bbls = barrels

Mbbls = one thousand barrels (1,000 barrels)

MMbls = one million barrels (1,000,000 barrels)

BOPD = barrels of oil per day

BOEPD = barrels of oil equivalent per day

MMBOE = million barrels of oil equivalent (1,000,000 barrels of oil equivalent)

Natural Gas

Mcf = one thousand cubic feet (1,000 cubic feet)

Bcf = one billion cubic feet (1,000,000,000 cubic feet)

MCFD = one thousand cubic feet per day (1,000 cubic feet per day)

MMCF = one million cubic feet (1,000,000 cubic feet)

MMCFD = one million cubic feet per day (1,000,000 cubic feet per day)

Source: Langenkamp, Robert D., ed. Th e Illustrated Petroleum Reference Dictionary. 4th ed. PennWell Books: Tulsa, 1994.

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