

Assumptions to the Annual Energy Outlook 2010

Table 9.1. Technically Recoverable U.S. Crude Oil Resources as of January 1, 2008

(billion barrels)

	Proved Reserves	Inferred Reserves	Undiscovered Technically Recoverable Resources	Total Technically Recoverable Resources
Lower 48 Onshore	14.2	48.3	25.3	87.8
Northeast	0.3	0.2	0.7	1.3
Gulf Coast	1.7	2.8	8.6	13.2
Midcontinent	1.1	7.1	1.0	9.1
Southwest	5.4	22.7	2.6	30.6
Rocky Mountain	2.7	8.2	10.1	20.9
West Coast	3.1	7.3	2.3	12.7
Lower 48 Offshore	4.4	10.3	47.2	61.9
Gulf (currently available)	3.8	9.4	30.3	43.5
Easter/Central Gulf (unavailable until 2022)	0.0	0.0	3.7	3.7
Pacific	0.7	0.9	10.5	12.0
Atlantic	0.0	0.0	2.7	2.7
Alaska (Onshore and Offshore)	4.2	2.1	42.0	48.3
Total U.S.	22.8	60.7	114.5	198.0

Note: Resources in areas where drilling is officially prohibited are not included in this table. Estimates of the resources within a 50-mile buffer off the Atlantic coast are also excluded from the technically recoverable volumes.

Source: Conventional Onshore, State Offshore, and Alaska - U.S. Geological Survey (USGS); Federal (Outer Continental Shelf) Offshore - Minerals Management Service (MMS); Proved Reserves - EIA, Office of Oil and Gas. Table values reflect removal of intervening reserve additions between the date of the latest available assessment and January 1, 2008.

Table 9.2. Technically Recoverable U.S. Natural Gas Resources as of January 1, 2008

(trillion cubic feet)

	Proved Reserves	Inferred Reserves	Undiscovered Technically Recoverable Resources	Total Technically Recoverable Resources
Lower 48 Onshore Non Associated	192.7	980.9	208.3	1382.0
Conventional	149.0	595.9	144.1	889.0
Northeast	10.0	55.5	8.9	74.4
Gulf Coast	45.2	154.3	75.2	274.6
Midcontinent	28.8	41.8	16.6	87.2
Southwest	12.4	51.9	14.6	78.9
Rocky Mountain	52.0	271.1	21.9	345.0
West Coast	0.7	21.2	7.0	28.9
Shale Gas	21.8	295.6	50.9	368.4
Northeast	6.0	73.2	0.0	79.2
Gulf Coast	6.6	90.3	0.0	96.9
Midcontinent	1.5	51.0	0.0	52.5
Southwest	7.5	59.5	0.0	67.0
Rocky Mountain	0.2	21.6	0.0	21.9
West Coast	0.0	0.0	50.9	50.9
Coalbed Methane	21.9	89.4	13.3	124.6
Northeast	1.8	4.6	0.0	6.4
Gulf Coast	1.8	5.1	0.0	6.8
Midcontinent	0.9	4.6	8.0	13.5
Southwest	0.0	0.0	0.0	0.0
Rocky Mountain	17.4	75.1	1.8	94.3
West Coast	0.0	0.0	3.6	3.6
Lower 48 Offshore Non Associated	12.4	50.7	233.0	296.0
Gulf (currently available)	12.4	50.4	167.6	230.4
Eastern/Central Gulf (unavailable until 2022)	0.0	0.0	21.5	21.5
Pacific	0.1	0.3	18.4	18.7
Atlantic	0.0	0.0	25.5	25.5
Associated-Dissolved Gas	20.7	--	117.2	137.9
Alaska	11.9	24.8	266.1	302.0
Total U.S.	237.7	1056.3	824.6	2118.7

Note: Resources in areas where drilling is officially prohibited are not included in this table. Estimates of the resources within a 50-mile buffer off the Atlantic coast are also excluded from the technically recoverable volumes. The Alaska value does not include stranded Arctic gas. The 117.2 Tcf of undiscovered Associated-Dissolved natural gas includes inferred reserves.

Source: Onshore, State Offshore, and Alaska - U.S. Geological Survey (USGS) with adjustments to Unconventional Gas Recovery resources by Advanced Resources, International; Federal (Outer Continental Shelf) Offshore - Minerals Management Service (MMS); Proved Reserves -- EIA, Office of Oil and Gas. Table values reflect removal of intervening reserve additions between the date of the latest available assessment and January 1, 2008.

Table 9.3. Onshore Lower 48 Technology Assumptions

	Ultimate Market Penetration	Market Penetration Curve	Probability of Successful R&D	Probability of Implementation	Drilling Success Rate	Exploration Success Rate	Injection Rate	Estimated Ultimate Recovery
Conventional Oil								
Infill Drilling	59%	linear	50%	44%	3%	3%	--	1%
Horizontal Continuity	60%	linear	51%	44%	3%	3%	25%	2.3%
Horizontal Profile	61%	concave	49%	45%	3%	3%	2%	1%
CO2 Flooding	61%	linear	51%	43%	3%	3%	38%	4.2%
Steam Flooding	60%	logistic	49%	44%	3%	3%	1%	9%
Polymer Flooding	61%	concave	50%	44%	3%	3%	12.3%	6%
Profile Modification	59%	concave	51%	42%	3%	3%	--	6%
Undiscovered	60%	concave	48%	44%	3%	3%	--	8%
Unconventiona Oil	60%	concave	48%	44%	3%	3%	--	8%
Conventional Gas								
Developing	61%	linear	48%	46%	3%	3%	--	4%
Undiscovered	61%	linear	49%	45%	3%	3%	--	7%
Shale Gas								
Developing	61%	linear	48%	45%	3%	3%	--	8%
Undiscovered	61%	linear	48%	45%	3%	3%	--	7%
Coalbed Methane								
Developing	60%	linear	50%	44%	3%	3%	--	5%
Undiscovered	60%	linear	49%	43%	3%	3%	--	5%

Source: Office of Integrated Analysis and Forecasting.

Table 9.4. Maximum Volume of CO₂ Available
(billion cubic feet)

OGSM Region	Natural Source of CO ₂	Industrial Sources of CO ₂					
		Hydrogen	Ammonia	Ethanol	Cement	Refineries	Fossil Fuel
Northeast	--	12	--	31	272	444	12980
Costs	80	146	118	--	131	1152	3930
Midcontinent	13	8	8	77	--	103	752
Southwest	742	--	--	--	--	292	--
Rocky Mountains	114	14	--	--	--	91	4041
West Coast	--	163	--	--	--	--	60
Total	949	343	126	108	403	2082	21763

Source: Office of Integrated Analysis and Forecasting.

Table 9.5. CO₂ Availability Assumptions

Source Type	R&D Phase (years)	Infrastructure Development (years)	Market Acceptance (years)	Ultimate Market Acceptance
Natural	0	1	3	100%
Hydrogen Plants	5	4	7	100%
Ammonia Plants	5	4	7	100%
Ethanol Plants	5	4	7	100%
Cement Plants	8	5	7	100%
Refineries	8	8	7	100%
Fossil Fuel Plants	8	8	7	100%

Source: Office of Integrated Analysis and Forecasting.

Table 9.6. Industrial CO₂ Capture & Transportation Costs by Region and Source
(\$/mcf)

OGSM Region	Industrial Sources of CO ₂					
	Hydrogen	Ammonia	Ethanol	Cement	Refineries	Fossil Fuel
Northeast	\$0.92	\$0.92	\$0.99	\$2.93	\$2.94	\$3.22
Costs	\$9.92	\$0.93	\$1.01	\$2.92	\$2.93	\$3.22
Midcontinent	\$0.92	\$0.90	\$1.02	\$2.91	\$2.94	\$3.22
Southwest	\$0.92	\$0.92	\$1.01	\$2.92	\$2.94	\$3.22
Rocky Mountains	\$0.92	\$0.92	\$1.01	\$2.92	\$2.94	\$3.22
West Coast	\$0.92	\$0.92	\$1.01	\$2.92	\$2.94	\$3.22

Source: Office of Integrated Analysis and Forecasting.

Table 9.7. Assumed Rates of Technological Progress for Unconventional Gas Recovery

Field/Project Name	Block	Water Depth (feet)	Year of Discovery	Field Size Class	Field Size (MMBoe)	Start Year of Production
Great White	AC857	8717	2002	14	372	2010
Telemark	AT063	4457	2000	12	89	2010
Droshky	GC244	2900	2007	12	89	2010
Hornet	GC379	3878	2001	13	182	2010
GC488	GC449	3266	2008	12	89	2010
MC503	MC503	3099	2008	14	372	2010
Cascade	WR206	8143	2002	14	372	2010
Chinook	WR469	8831	2003	14	372	2010
Trident	AC903	9743	2001	13	182	2011
Ozona	GB515	3000	2008	12	89	2011
Knotty Head	GC512	3557	2005	15	691	2011
West Tonga	GC726	4674	2007	12	89	2011
Ringo	MC546	2460	2006	14	372	2011
Tubular Bells	MC725	4334	2003	12	89	2011
Pony	GC468	3497	2006	13	182	2012
Norman	GB434	5000	2006	15	691	2013
Puma	GC823	4129	2003	14	372	2013
Kaskida	KC292	5860	2006	15	691	2013
Big Foot	WR029	5235	2005	12	89	2013
St. Malo	WR678	7036	2003	14	372	2013
Jack	WR759	6963	2004	14	372	2013
Grand Cayman	GB517	5000	2006	13	182	2014
Kodiak	MC771	4986	2008	15	691	2015
Stones	WR508	9556	2005	12	89	2015
Entrada	GB782	4690	2000	14	372	2016
Freedom	MC948	6095	2008	15	691	2017
Julia	WR627	7087	2007	12	89	2017
Hal	WR848	7657	2008	12	89	2018
Tiber	KC102	4132	2009	16	1419	2019

Source: Office of Integrated Analysis and Forecasting.

Table 9.8. Offshore Exploration and Production Technology Levels

Technology Level	Total Improvement (percent)	Number of Years
Exploration success rates	30	30
Delay to commence first exploration and between Exploration & development drilling costs	15	30
Operating cost	30	30
Time to construct production facility	30	30
Production facility construction costs	15	30
Initial constant production rate	30	30
Decline rate	0	30

Source: Office of Integrated Analysis and Forecasting.