

**Table 54. Assumed Rates of Technological Progress for Unconventional Gas Recovery**

Technology Group	Item	Type of Deposit	Technology Case		
			Slow	Reference	Rapid
1	Year Hypothetical Plays Become Available	All Types-Non DOE	NA	NA	NA
		All Types-DOE	NA	2016	2009
2	Decrease in Extended Portion of Development Schedule for Emerging Plays (per year)	Coalbed Methane and Tight Sands - Non DOE	0.83%	1.67%	2.50%
		Gas Shales-Non DOE	1.25%	2.50%	3.75%
		All Types - DOE	1.25%	2.50%	3.75%
3	Expansion of Existing Reserves (per year -declining 0.1% per year; eg., 3.0, 2.0...)	Tight Sands	1.0%	2.0%	3.0%
		Coalbed Methane & Gas Shales	2.0%	4.0%	6.0%
4	Increase in Percentage of Wells Drilled Successfully (per year)	All Types	0.1%	0.2%	0.3%
	Year that Best 30 Percent of Basin is Fully Identified	All Types	2100	2044	2031
5	Increase in EUR per Well (per year)	All Types	0.13%	0.25%	0.38%
6	Increase in EUR per Well (per year)	All Types	0.13%	0.25%	0.38%
7	Decrease in Drilling and Stimulation Costs per Well (per year)	All Types	NA	NA	NA
8	Decrease in Water and Gas Treatment O&M Costs per Well (per year)	All Types	NA	NA	NA
9	Year Advanced Well Completion Technologies Become Available	Coalbed Methane	NA	NA	NA
		Tight Sands & Gas Shales	NA	2016	2009
	Increase in EUR per well (total increase)	Coalbed Methane	NA	NA	NA
		Tight Sands	NA	10%	15%
		Gas Shales	NA	20%	30%
10	Year Advanced Recovery Technologies Become Available	Coalbed Methane & Tight Sands	NA	NA	2023
		Gas Shales	NA	NA	NA
		Increase in EUR per well (total increase)	Coalbed Methane	NA	NA
	Increase in Costs (\$1996/Mcf) for Incremental CBM production	Tight Sands	NA	NA	1.75
		Gas Shales	NA	NA	0.75
		All Types - Non DOE	0.5%	1.0%	1.5%
11	Proportion of Areas Current Restricted that become Available for Development (per year)	All Types - DOE	0.25%	0.5%	0.75%

EUR = Estimated Ultimate Recovery.

O&M = Operation & Maintenance.

CBM = Coalbed Methane.

NA = Not applicable.

DOE = Those plays in the Rocky Mountain basins assessed as part of Department of Energy sponsored basin studies.

Source: Reference Technology Case, Advanced Resources, International; Slow and Rapid Technology Cases, Energy Information Administration, Office of Integrated Analysis and Forecasting.