

Long Term World Oil Supply

(A Resource Base/Production Path Analysis)



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Energy Information Administration

Executive Summary

- These pages summarize a recent EIA presentation on when world conventional oil production will peak and the effect of different estimates of the world conventional oil resource base.
- A larger resource base generally leads to a later production peak. World oil resource base estimates have trended upward over the years, from 600 billion barrels estimated in the early 1940's to as high as 3,900 billion barrels estimated this year by the U.S. Geological Survey (USGS).
- To illustrate the important factors affecting estimates of the peak production year, EIA postulated 12 scenarios based on three current USGS world conventional oil resource base estimates (2,248, 3,003 and 3,896 billion barrels - corresponding to high, mean and low probabilities of occurrence) and four world oil production annual growth rates (0, 1, 2 and 3 percent.)

Executive Summary (Continued)

- Using a relatively simple algorithm, peak production years were estimated. The peak production year estimates ranged from 2021 to 2112 across the 12 scenarios. For example, using the USGS mean (expected) resource base estimate (3,003 billion barrels) and an annual production growth rate of 2 percent (similar to the current rate), the estimated peak production year is 2037.
- EIA's estimates for production peaks occur later than those generated by other analysts, some of whom predicted the production peak will occur as early as 2004. EIA's analysis indicates instead that world conventional oil production may increase two decades or more before it begins to decline.

Executive Summary (Continued)

- EIA's relative optimism is based on:

- (1) use of the current USGS world conventional oil resource estimates, which are both larger and more technically sound than past resource estimates used by others, and

- (2) use of a methodology for estimating the post-peak production path that is based on the reserve to production (R/P) ratio observed in the United States since oil production peaked in 1970.

- Other factors, e.g., choice of different production curve hypotheses, market dynamics, technological advances, and economic policies, could change the results, perhaps substantially.

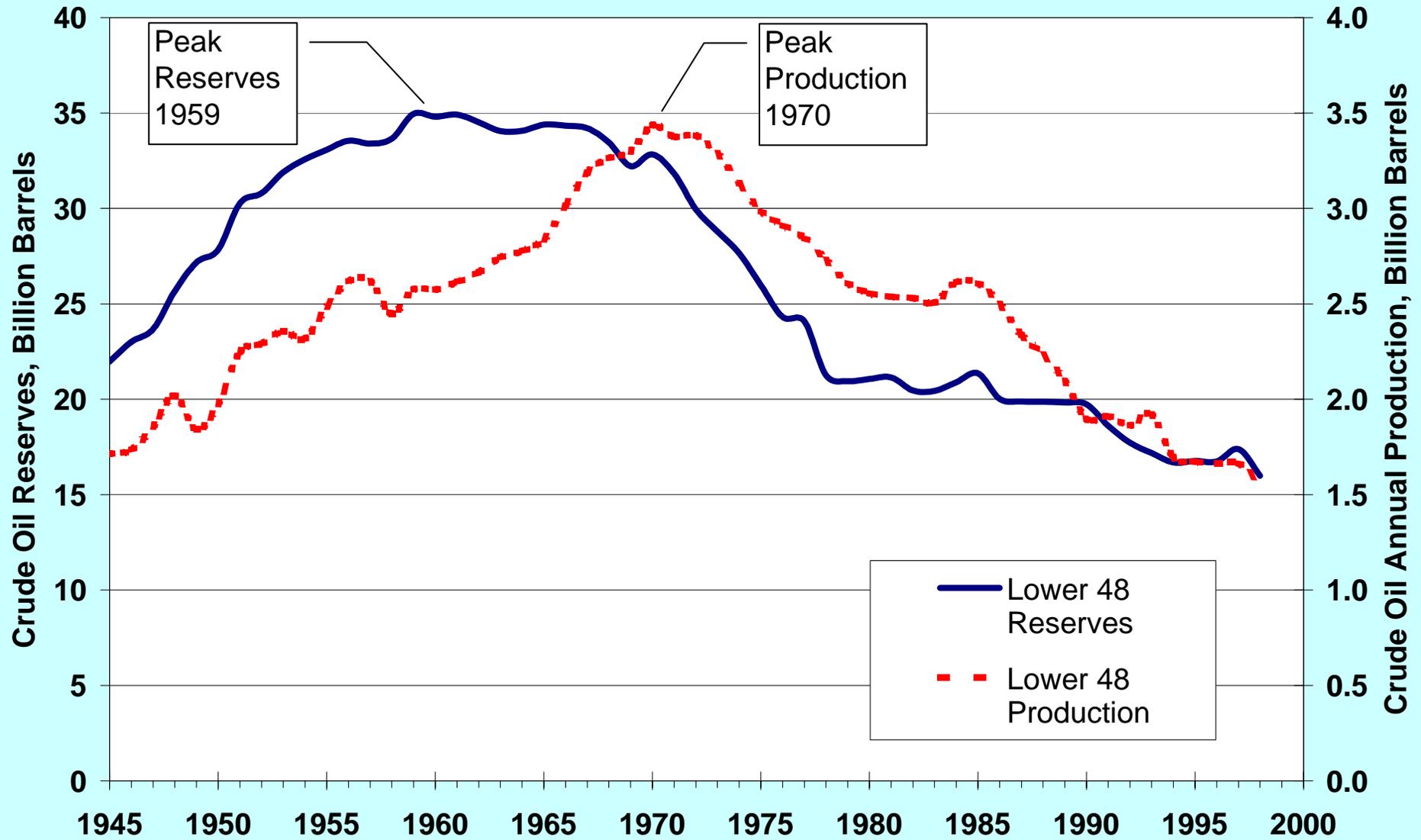
Overview

- Oil Resources (Estimates)
- Year of Peak Oil Production (Scenarios)
 - U.S.
 - World
- What Might Change the Estimated Time of Peak Production?
- Conclusions

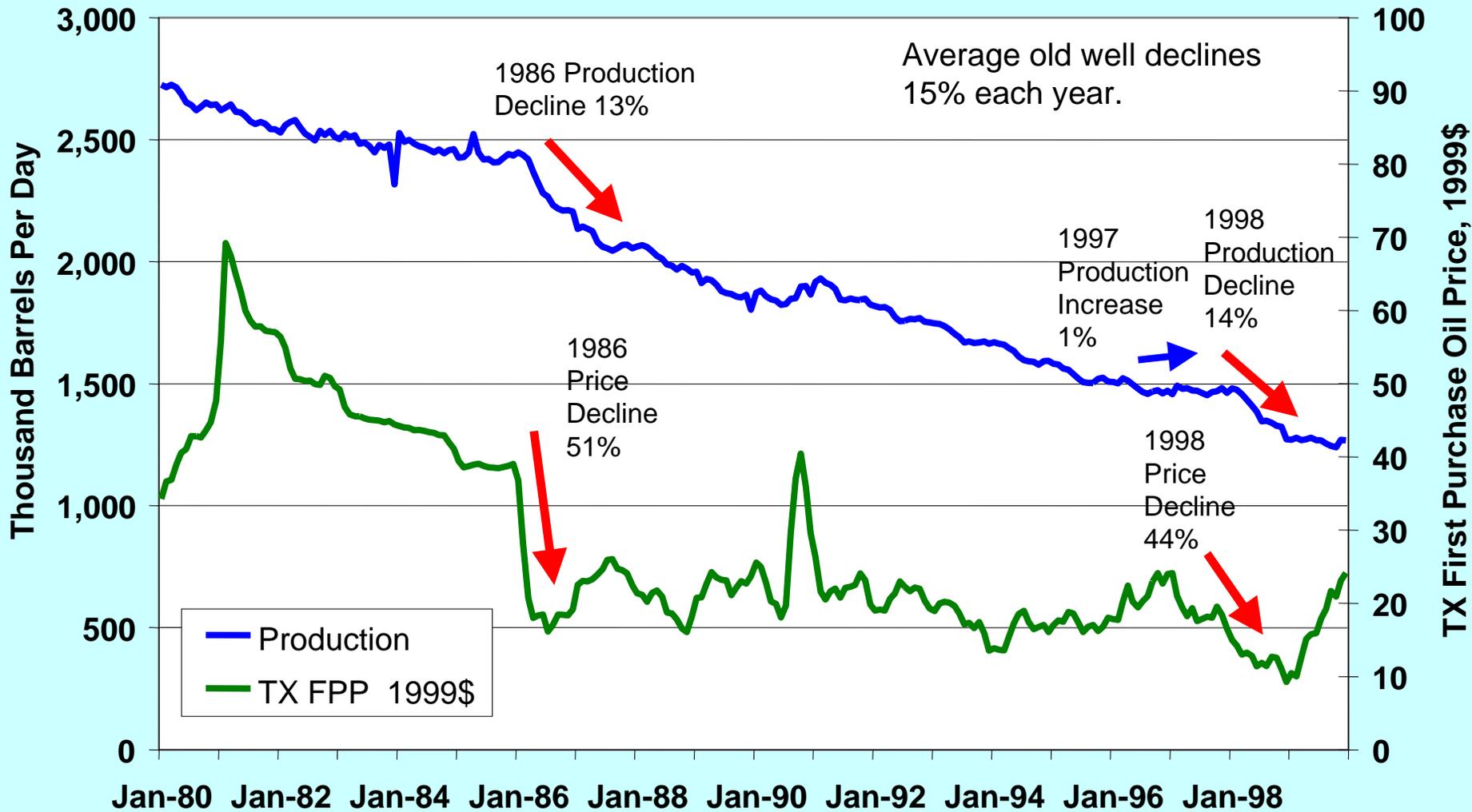
The Year of Peak Production

When will worldwide conventional oil production peak?

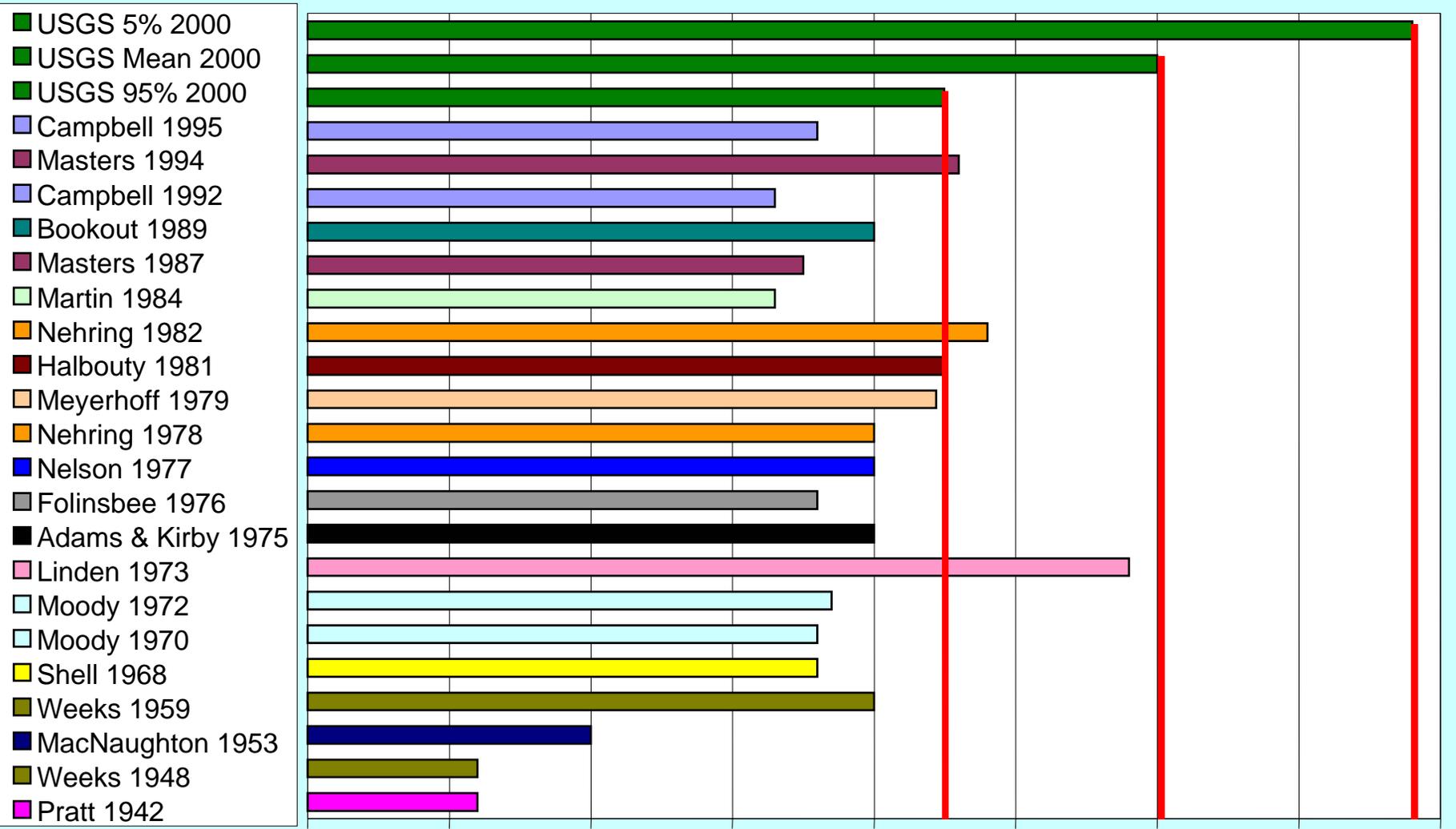
Lower 48 Crude Oil Reserves & Production, 1945-2000



Texas Oil and Condensate Production, and Texas First Purchase Price (FPP), 1980-1999



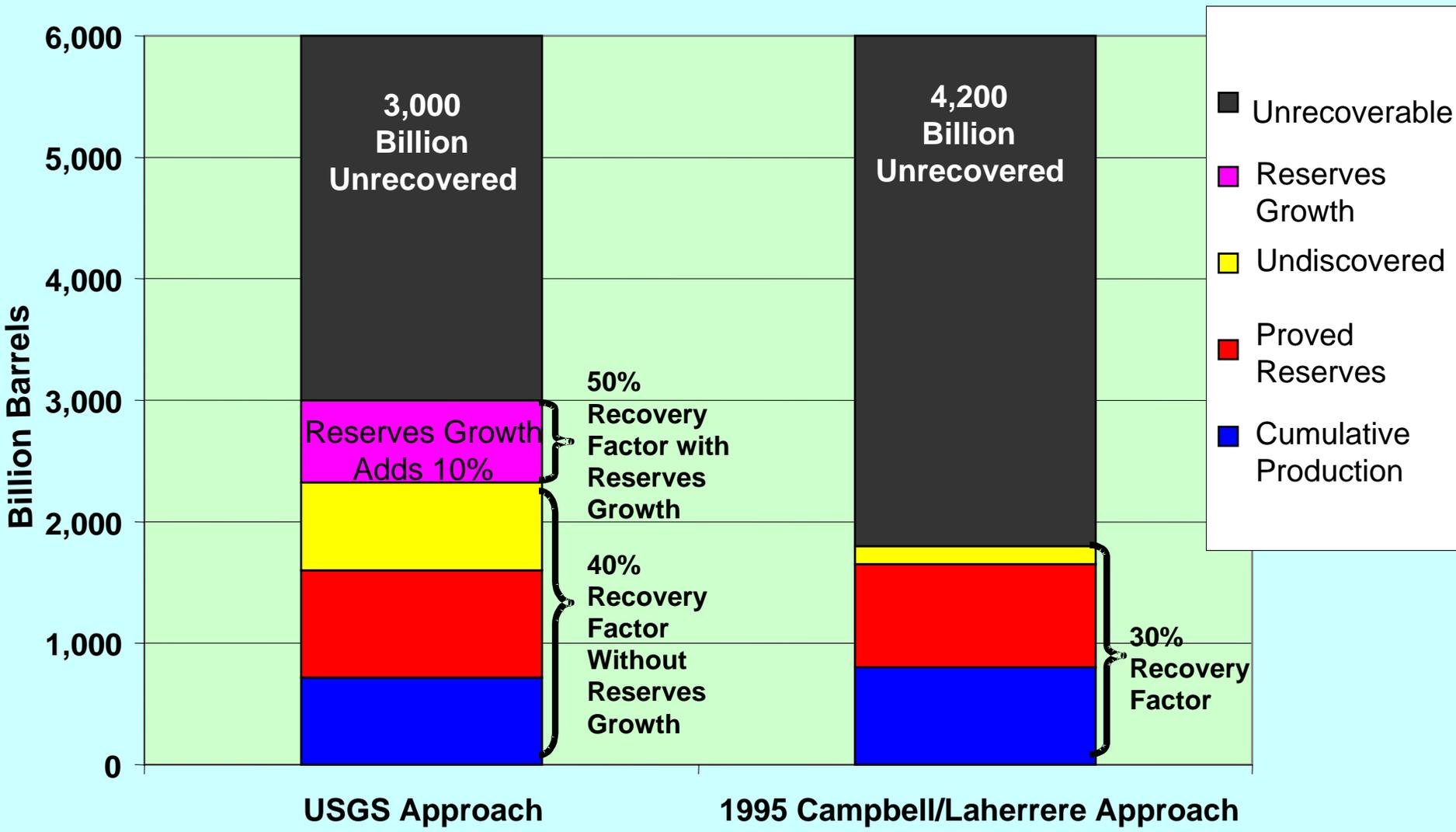
Published Estimates of World Oil Ultimate Recovery



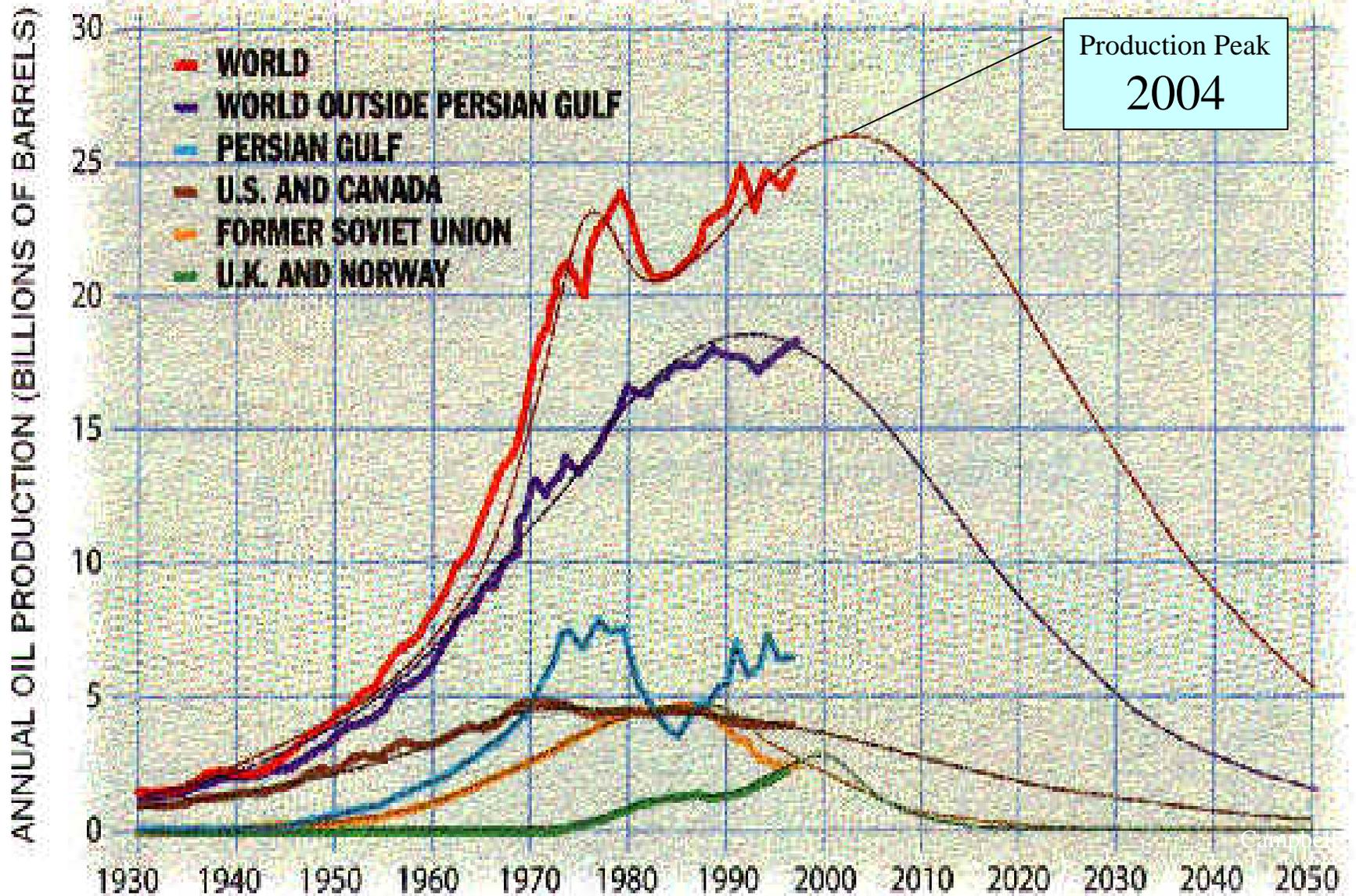
Source: USGS and Colin Campbell

Trillions of Barrels

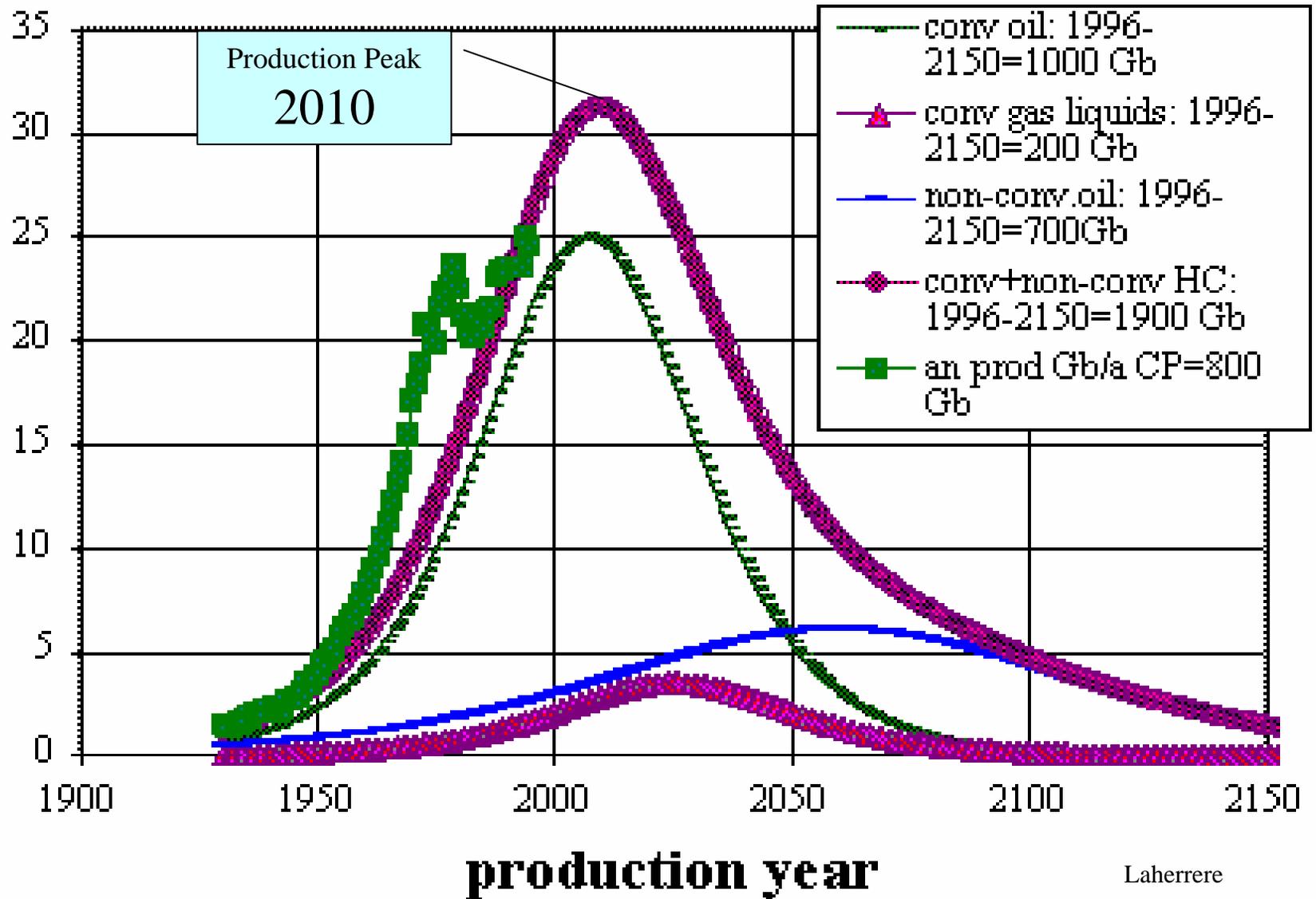
Different Interpretations of a Hypothetical 6,000 Billion Barrel World Original Oil-in-Place Resource Base



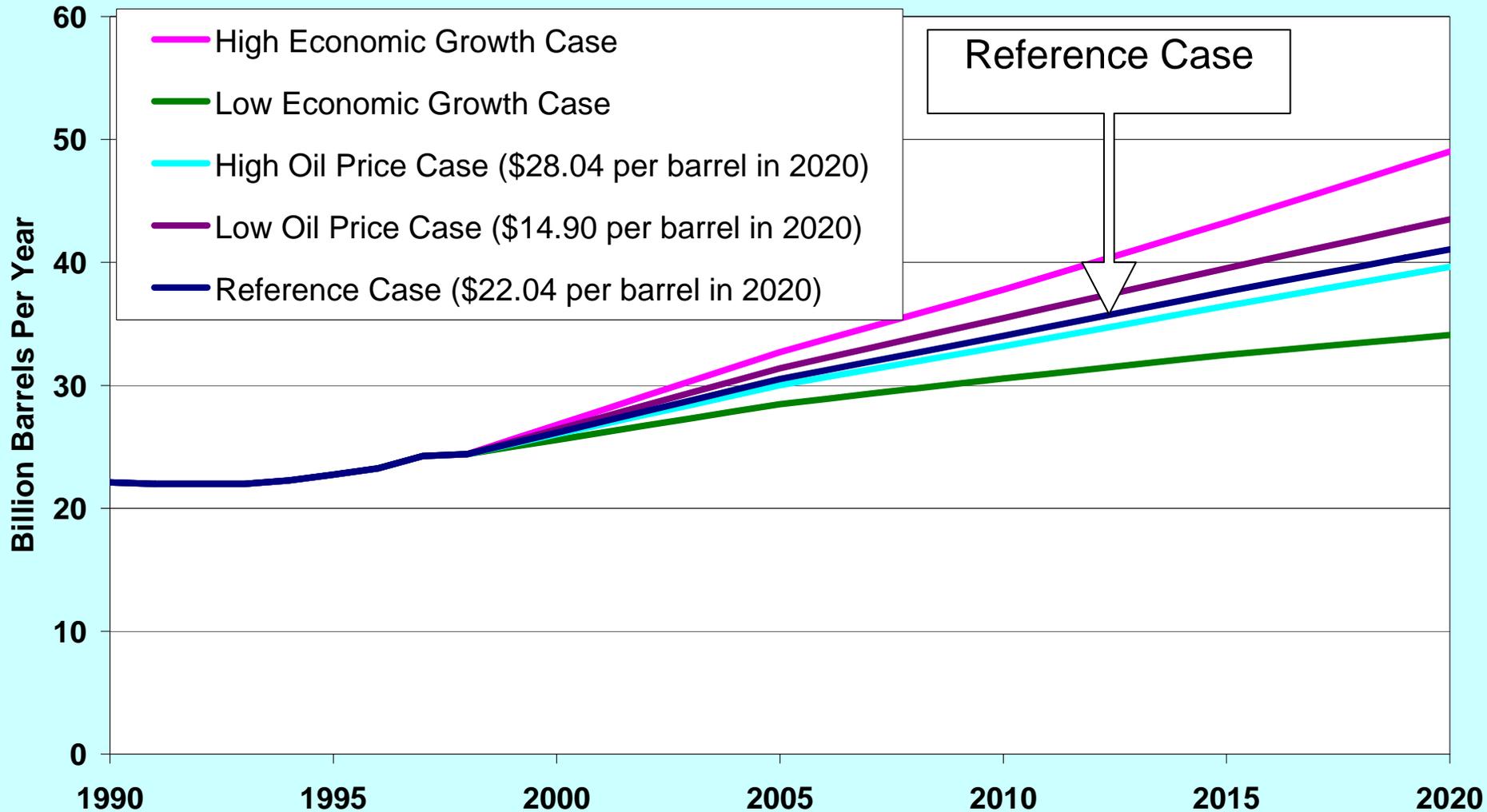
Campbell-Laherrère World Oil Production Estimates, 1930-2050



Laherrere's Oil Production Forecast, 1930-2150

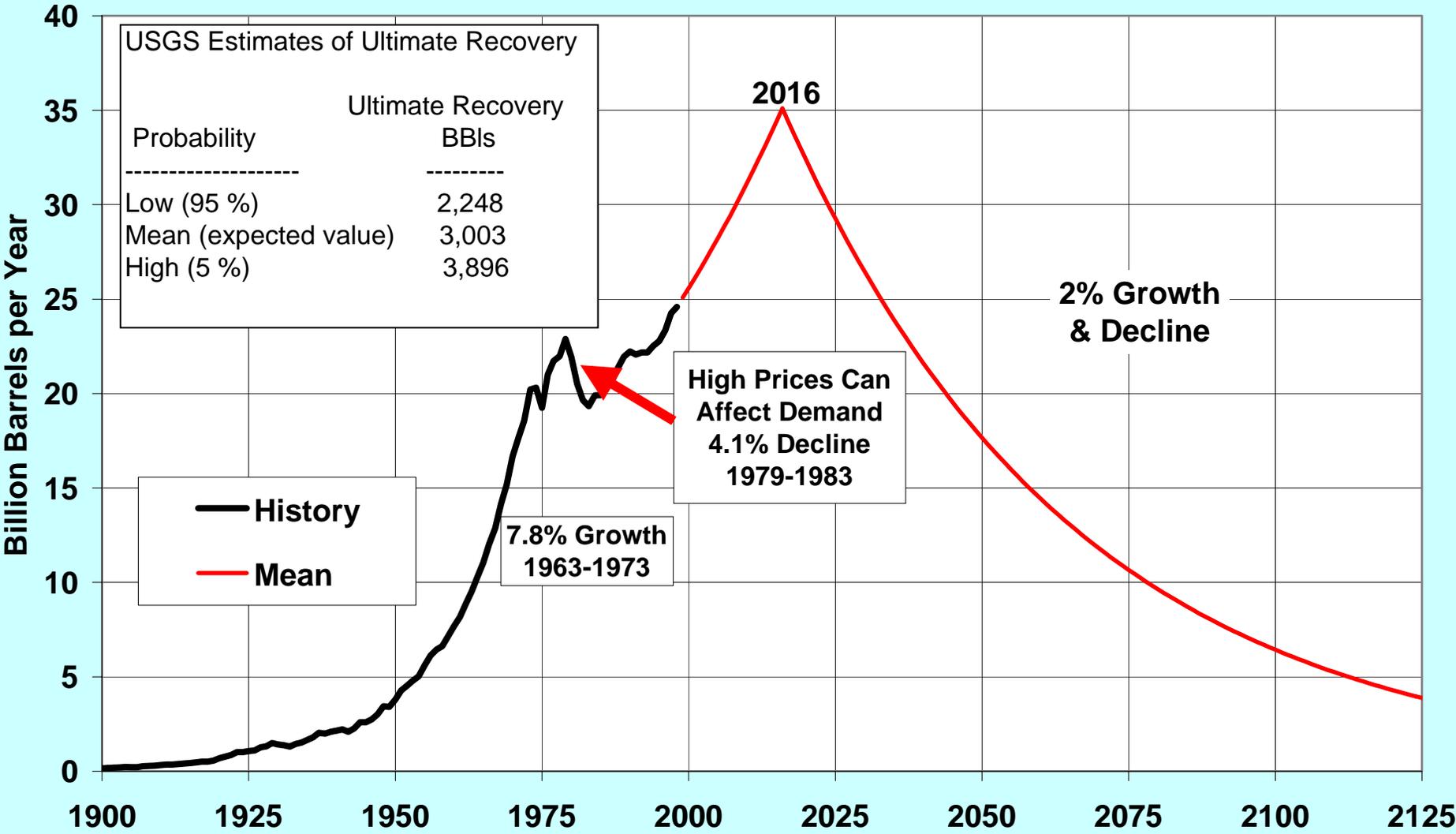


EIA World Oil Production Projections, 1990-2020



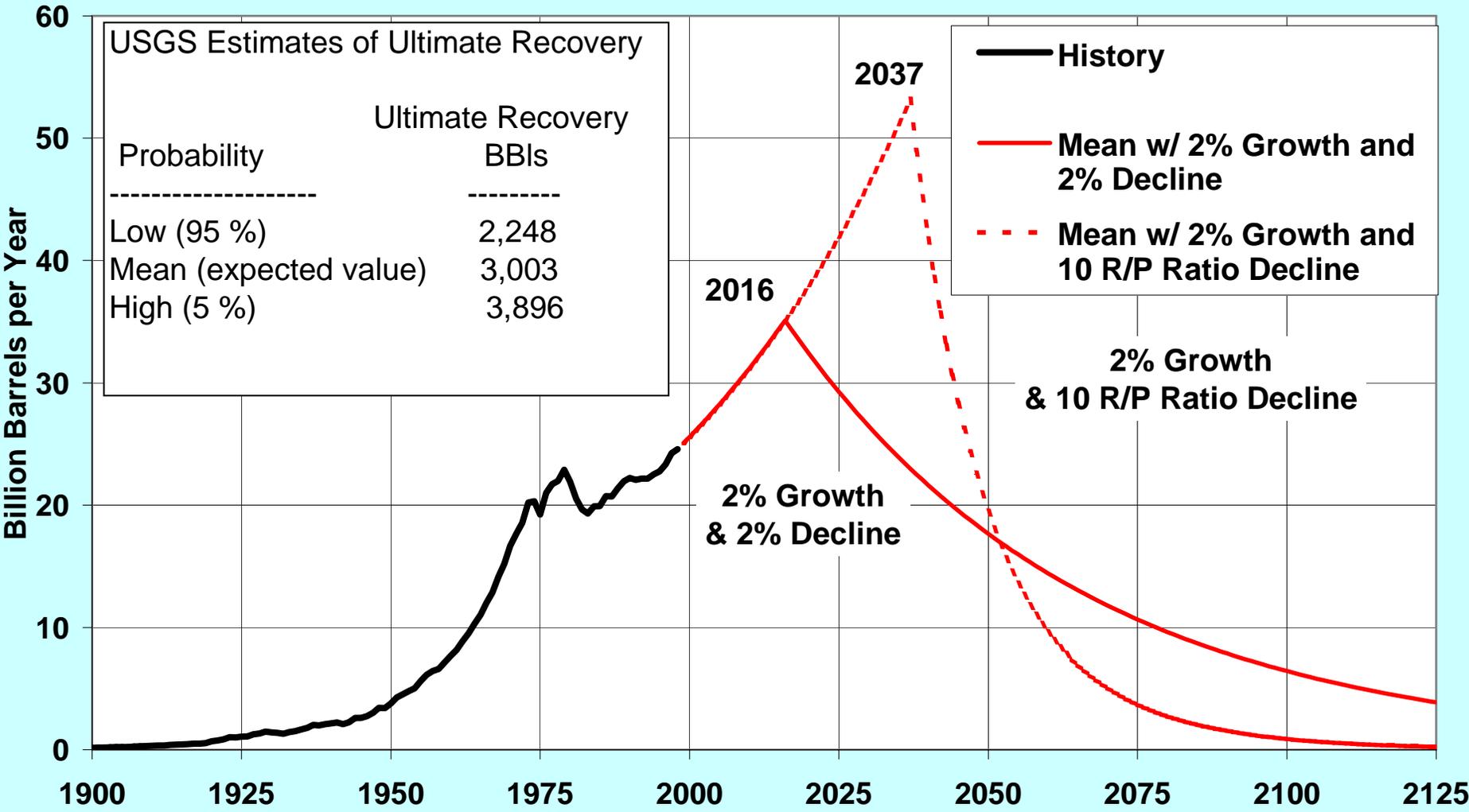
Source: *International Energy Outlook 2000*

Annual Production with 2 Percent Annual Growth & Decline



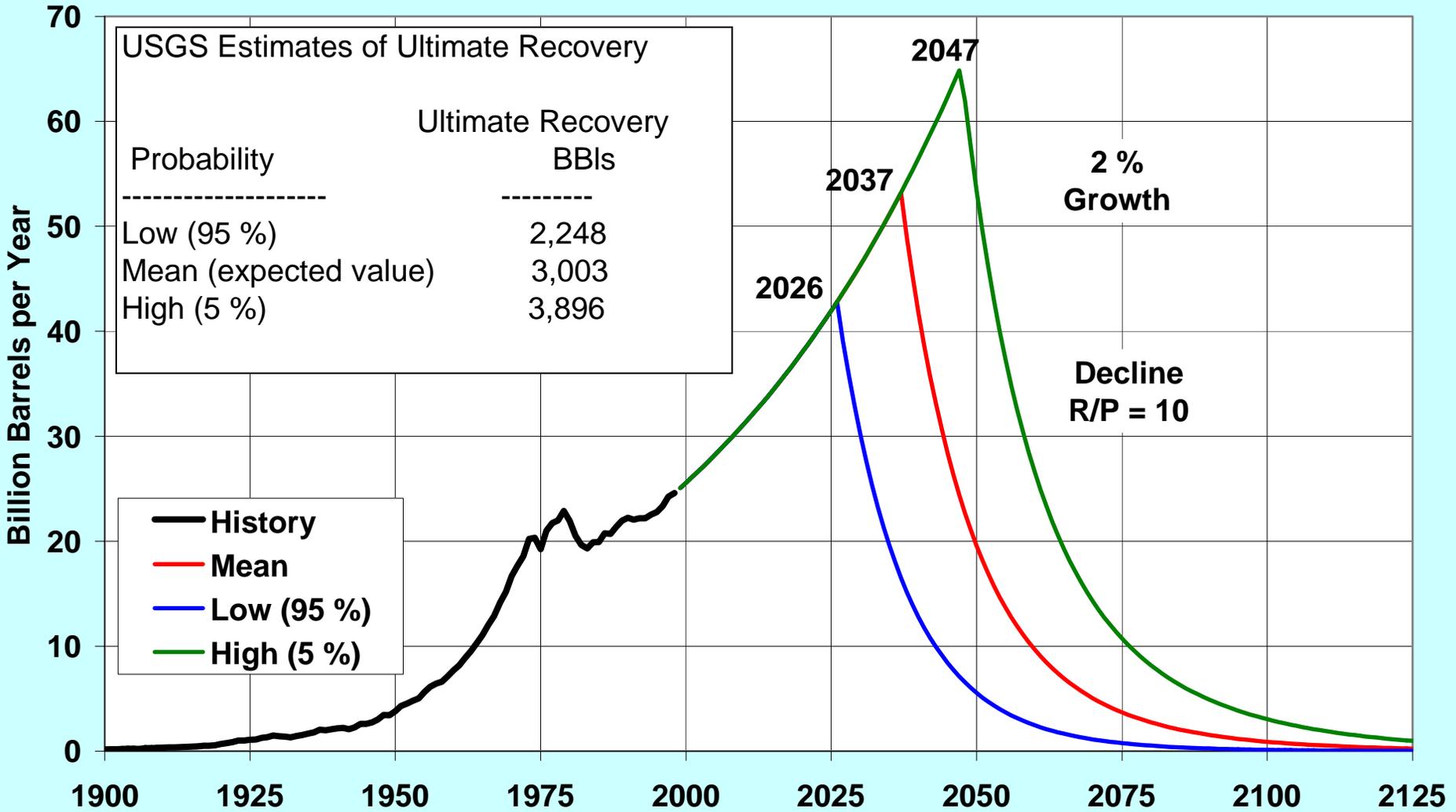
Note: U.S. volumes were added to the USGS foreign volumes to obtain world totals.

Annual Production Scenarios with 2 Percent Growth Rates and Different Decline Methods



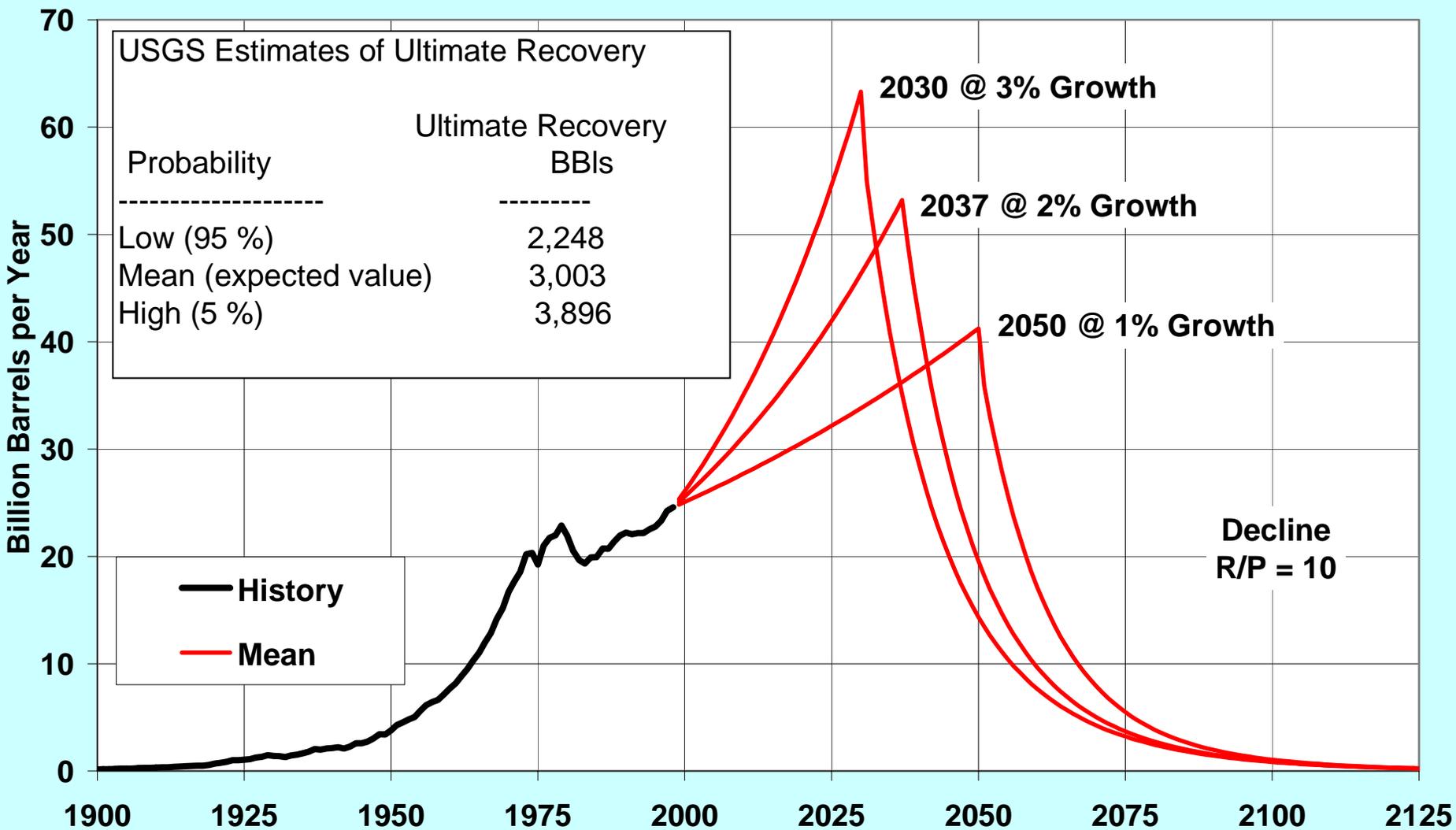
Note: U.S. volumes were added to the USGS foreign volumes to obtain world totals.

Annual Production Scenarios with 2 Percent Growth Rates and Different Resource Levels (Decline R/P = 10)



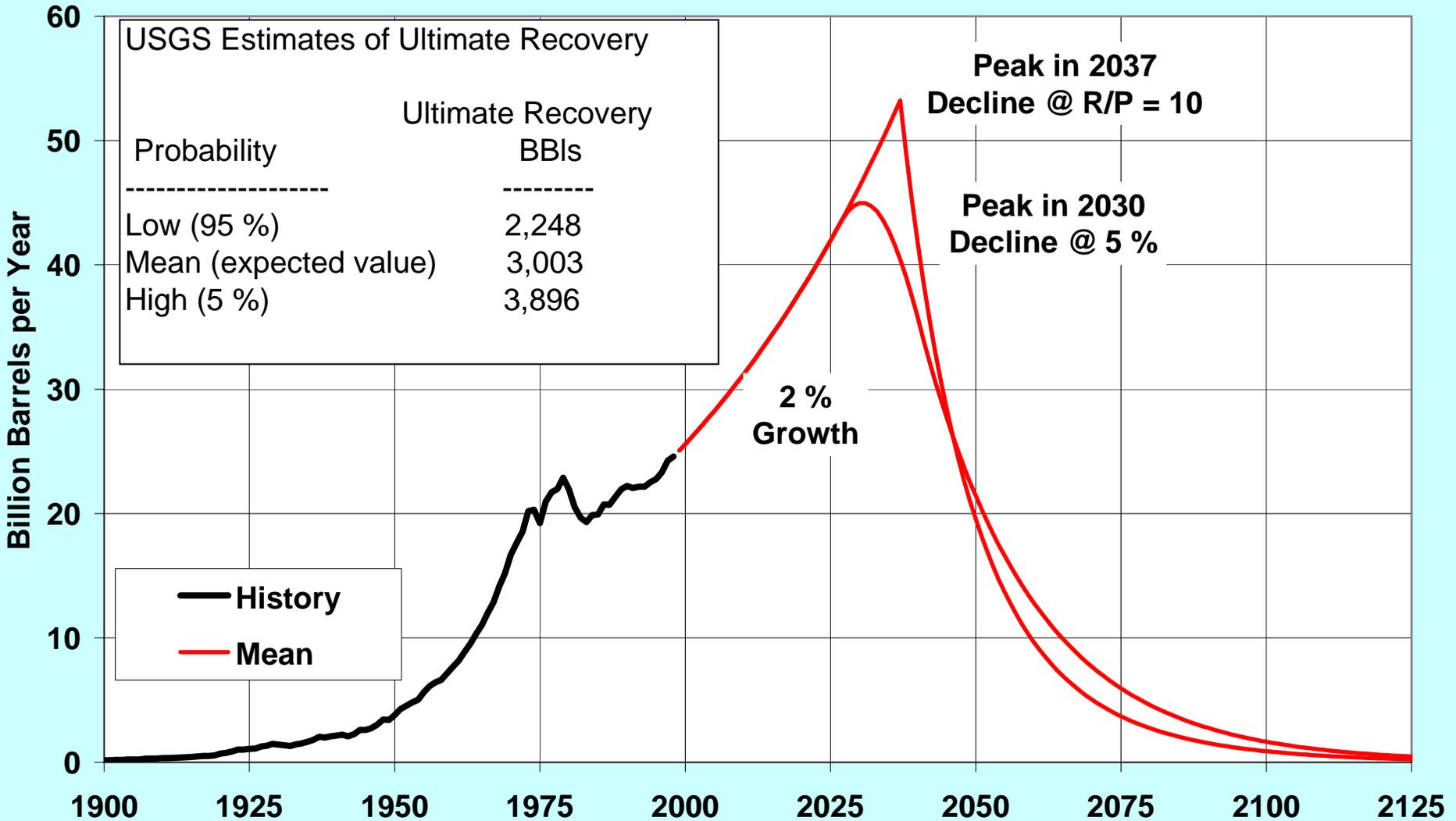
Note: U.S. volumes were added to the USGS foreign volumes to obtain world totals.

Annual Production Scenarios for the Mean Resource Estimate and Different Growth Rates (Decline R/P = 10)



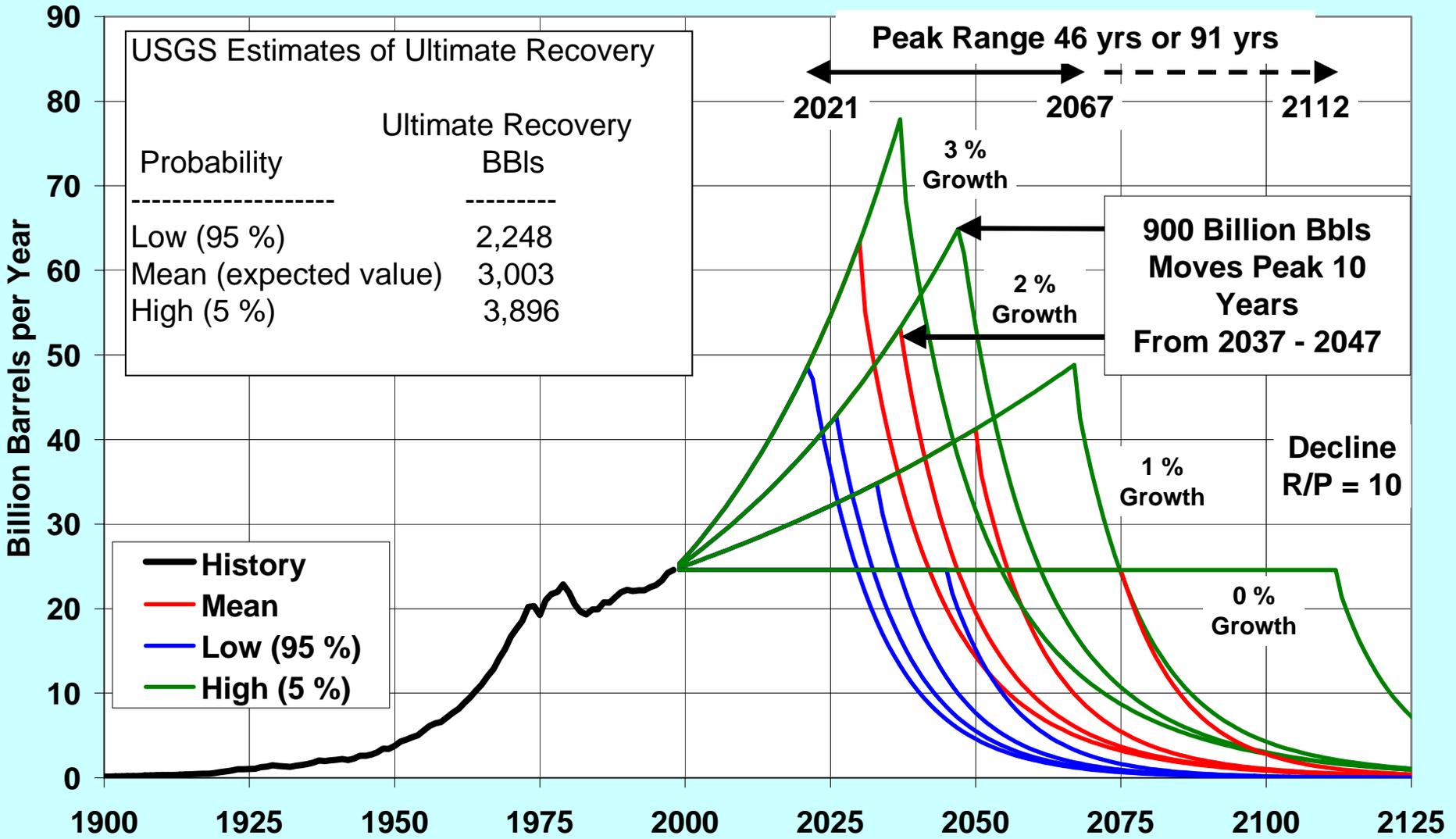
Note: U.S. volumes were added to the USGS foreign volumes to obtain world totals.

Annual Production Scenarios for the Mean Resource Estimate Showing Sharp and Rounded Peaks



Note: U.S. volumes were added to the USGS foreign volumes to obtain world totals.

12 EIA World Conventional Oil Production Scenarios



Note: U.S. volumes were added to the USGS foreign volumes to obtain world totals.

WORLD OIL PRODUCTION SCENARIOS

Probability of Ultimate Recovery	Ultimate Recovery (Billion barrels)	Annual Production Growth Rate (Percent)	Estimated Peak Year	Estimated Peak Production Rate	
				(Million barrels per year)	(Million barrels per day)
95 Percent	2,248	0.0	2045	24,580	67
	2,248	1.0	2033	34,820	95
	2,248	2.0	2026	42,794	117
	2,248	3.0	2021	48,511	133
Mean (expected value)	3,003	0.0	2075	24,580	67
	3,003	1.0	2050	41,238	113
	3,003	2.0	2037	53,209	146
	3,003	3.0	2030	63,296	173
5 Percent	3,896	0.0	2112	24,580	67
	3,896	1.0	2067	48,838	134
	3,896	2.0	2047	64,862	178
	3,896	3.0	2037	77,846	213