

Annual Energy Outlook 2013

Preliminary Reference Case Results for Oil



AEO2013 Oil and Gas Supply Working Group Meeting
Office of Petroleum, Gas, and Biofuels Analysis
October 4, 2012 | Washington, DC

WORKING GROUP PRESENTATION FOR DISCUSSION PURPOSES
DO NOT QUOTE OR CITE AS RESULTS ARE SUBJECT TO CHANGE

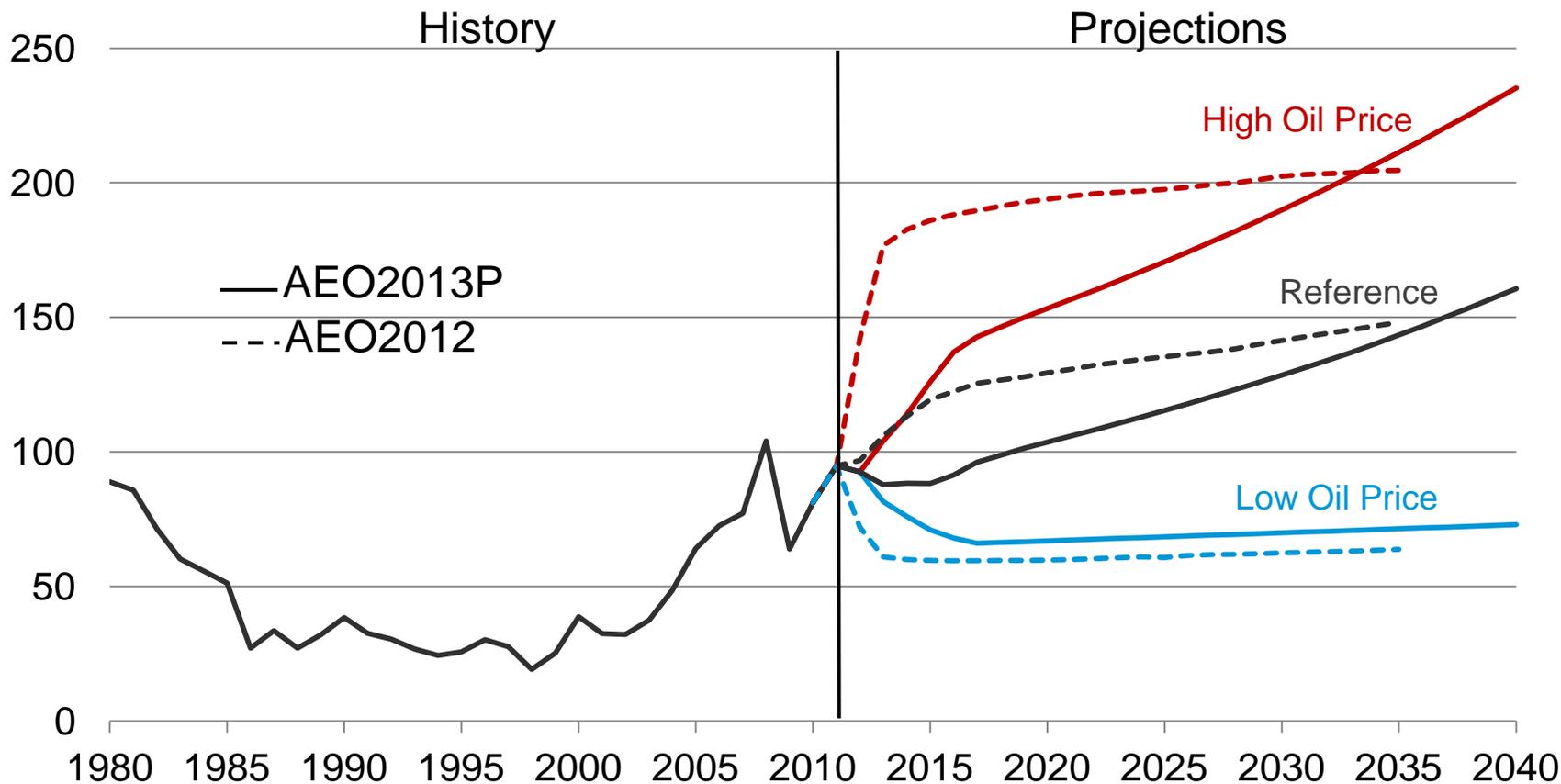
AEO2013P uses ref2013.d100312b
AEO2012 uses ref2012.d020112c

Changes for AEO2013

- Revised shale & tight play resources (EURs, type curves)
- Updated classification of shale gas, tight gas, & tight oil reservoirs
- Updated offshore announced discoveries
- Updated assumptions for Canada
- Estimated world natural gas prices in order to endogenously model LNG exports
- Updated methodology for calculating the Henry Hub price
- Updated historical data and related parameters

Oil price cases for AEO2013P compared to AEO2012

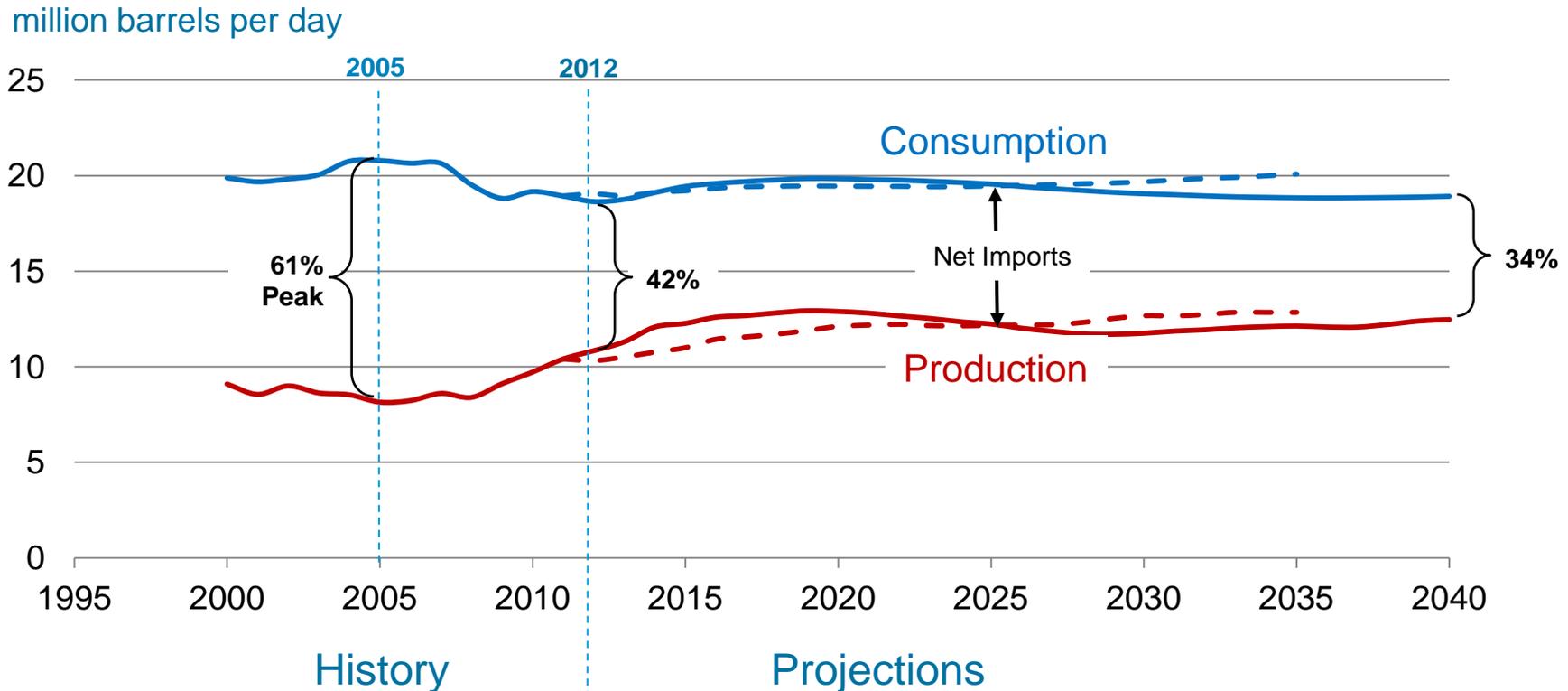
annual average price of light, low sulfur crude oil
real 2011 dollars per barrel



Source: Preliminary AEO2013 runs, dated as of 10/03/12

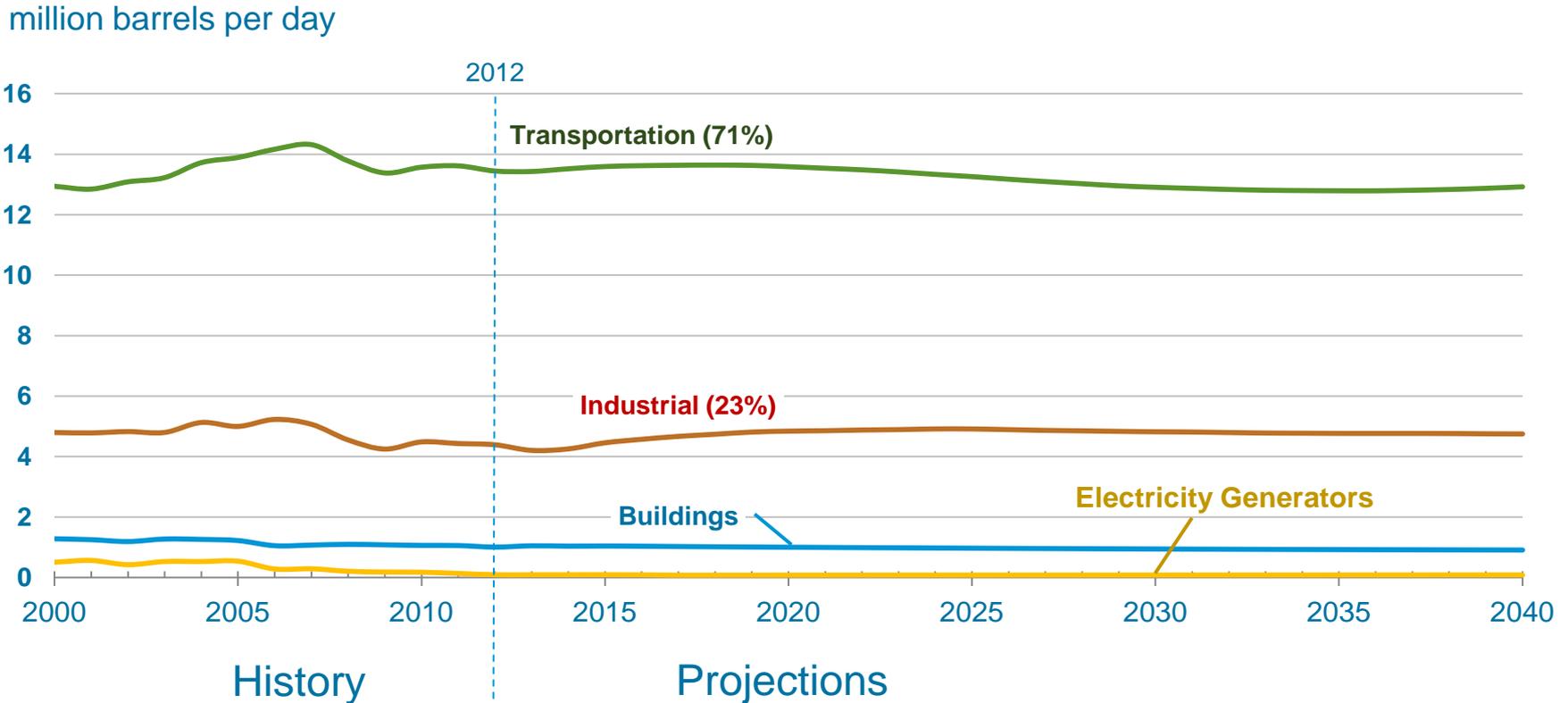
U.S. reliance on imported liquid fuels is reduced by increased domestic production and greater fuel efficiency

— AEO 2013P
 - - - AEO 2012



Source: Preliminary AEO2013 runs, dated as of 10/03/2012

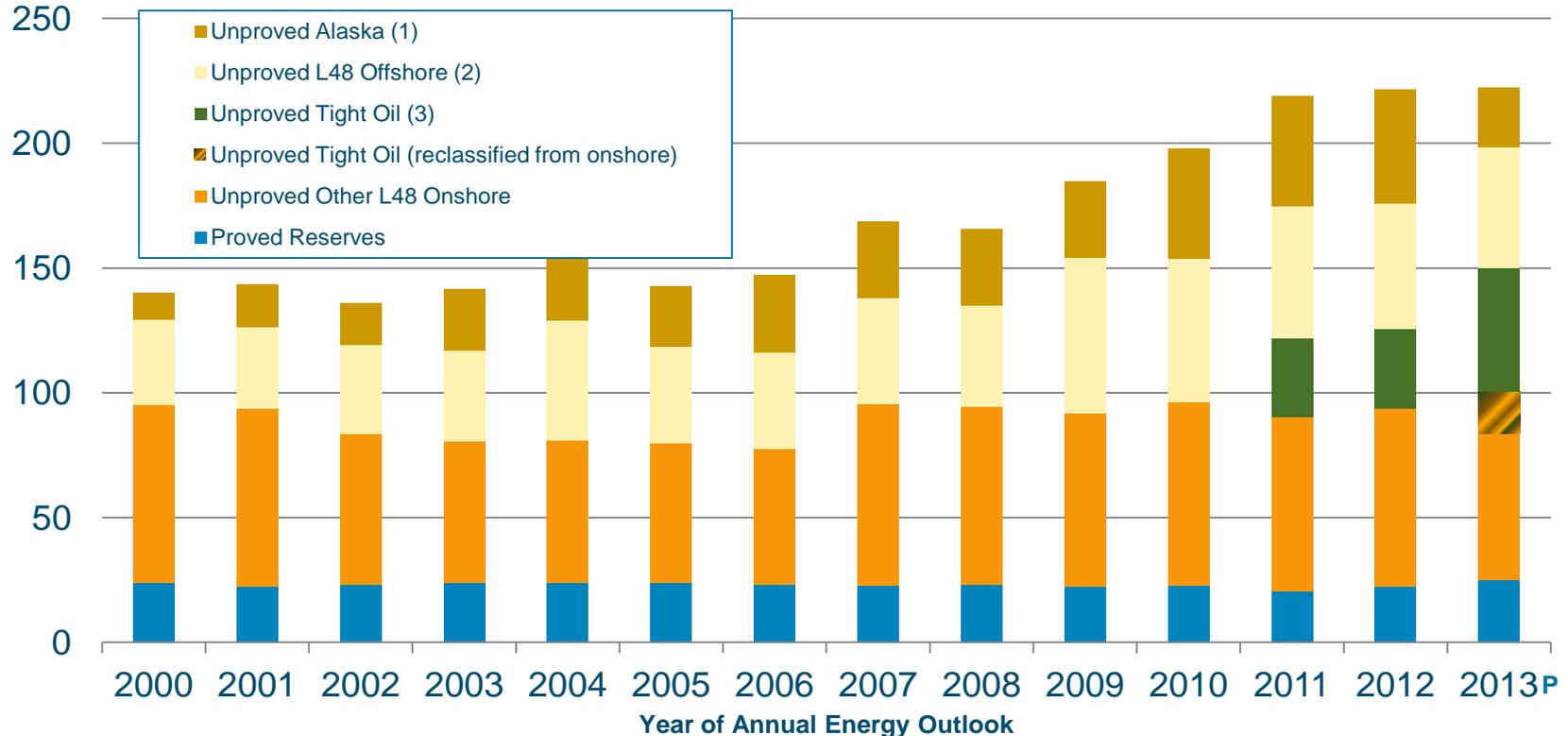
Liquid fuels consumption by sector, 1990-2040



Source: Preliminary AEO2013 runs, dated as of 10/03/2012

Multiple factors have contributed to crude oil resource estimate increases over the years, with tight oil contributing recently

U.S. crude oil and lease condensate resources in non-prohibited areas
billion barrels



- (1) The USGS reduced NPR-A resource estimates, which is responsible for the lower AEO2013 Alaska resources.
- (2) Prior to AEO2009, resources in Pacific, Atlantic, and Eastern GOM OCS were under moratoria and not included.
- (3) Includes shale oil. Prior to AEO2011, tight oil is included in unproved other lower-48 onshore category.

Source: Preliminary AEO2013 runs, dated as of 10/03/2012

Lower 48 unproved tight oil resources (million bbls)

| REGION | BASIN | PLAY | AEO2013 | AEO2012 * |
|-----------------|--------------------------|---------------------------|---------------|---------------|
| East | Appalachian | Marcellus | 1,577 | |
| | | Utica | 3,489 | |
| Gulf Coast | West Gulf | Austin Chalk | 7,096 | 2,303 |
| | | Cotton Valley/Bossier | 291 | |
| | | Eagle Ford Shale | 11,629 | 3,350 |
| | | Vicksburg | 89 | |
| | | Wilcox/Lobo | 37 | |
| Midcontinent | Anadarko | Woodford Shale | 688 | 387 |
| | | Granite Wash / Atoka | 1,069 | |
| Southwest | Permian | Abo / Canyon | 932 | |
| | | Avalon/Bone Springs Shale | 1,763 | 1,576 |
| | | Barnett | 183 | |
| | | Spraberry | 3,418 | 521 |
| | | Wolfcamp | 2,303 | |
| Rocky Mountains | Denver | Niobrara | 1,444 | 599 |
| | Greater Green River | | 103 | |
| | Montana Thrust Belt | | 602 | 652 |
| | Powder River Basin | Mowry/Niobrara | 2,417 | 2,349 |
| | San Juan | | 62 | |
| | Southwestern Wyoming | Niobrara | 1,970 | 1,970 |
| | Uinta-Piceance / Paradox | | 122 | 507 |
| | Williston | Bakken Shale | 11,058 | 3,587 |
| West Coast | San Joaquin/Los Angeles | Monterey/Santos Shale | 13,712 | 13,992 |
| Total | | | 66,056 | 31,791 |

* AEO2012 values in this table were only for oil and did not include condensates. AEO2013 Preliminary: includes both oil and condensates.

Lower 48 unproved tight oil resources (million bbls)

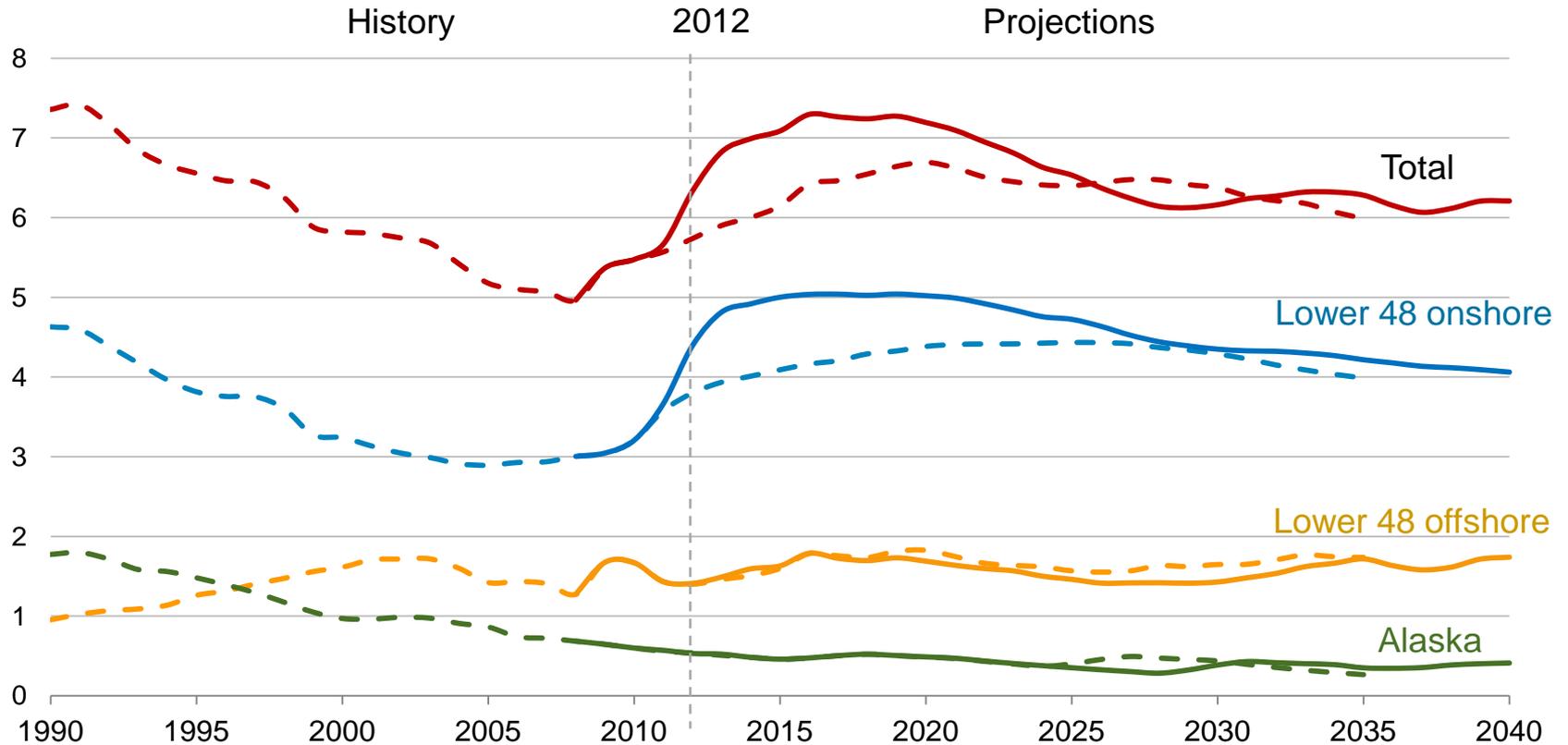
| Basin | Play | TRR (mmb) | | | Wells Needed to Develop TRR | | |
|-------------------------|-----------------------|-----------|-------------|--------|-----------------------------|-------------|---------|
| | | Oil | Condensates | Total | Oil | Condensates | Total |
| Appalachian | Marcellus | | 898 | 898 | | 70,519 | 70,519 |
| | Utica | 938 | - | 938 | | 47,238 | 47,238 |
| West Gulf | Austin Chalk | 7,809 | | 7,809 | 79,850 | | 79,850 |
| | Cotton Valley/Bossier | | 755 | 755 | | 47,321 | 47,321 |
| | Eagle Ford | 6,437 | 5,560 | 11,996 | 20,048 | 31,597 | 51,645 |
| | Vicksburg | | 88 | 88 | | 2,875 | 2,875 |
| | Wilcox/Lobo | | 42 | 42 | | 7,076 | 7,076 |
| Anadarko | Woodford | 475 | 1,330 | 1,805 | 22,234 | 12,945 | 35,179 |
| | Granite Wash/Atoka | | 650 | 650 | | 10,160 | 10,160 |
| Permian | Abo/Canyon | | 768 | 768 | | 63,403 | 63,403 |
| | Avalon/Bonespring | 2,420 | | 2,420 | 12,700 | | 12,700 |
| | Barnett | | 207 | 207 | | 11,208 | 11,208 |
| | Spraberry | 3,487 | | 3,487 | 5,539 | | 5,539 |
| | Wolfcamp | 2,326 | | 2,326 | 11,709 | | 11,709 |
| Denver | | 1,444 | | 1,444 | 39,185 | | 39,185 |
| Greater Green River | | | 42 | 42 | | 15,105 | 15,105 |
| Montana Thrust Belt | | 602 | | 602 | 5,433 | | 5,433 |
| Powder River | | 2,417 | | 2,417 | 63,488 | | 63,488 |
| San Juan | | | 67 | 67 | | 33,226 | 33,226 |
| Southwestern Wyoming | | 1,972 | | 1,972 | 17,691 | | 17,691 |
| Uinta/Piceance | | 68 | - | 68 | 1,367 | 12,379 | 13,746 |
| Williston | Bakken | 10,414 | | 10,414 | 37,366 | | 37,366 |
| San Joaquin/Los Angeles | Monterey/Santos | 13,712 | | 13,712 | 27,613 | | 27,613 |
| | | 54,521 | 10,406 | 64,927 | 344,223 | 365,052 | 709,275 |

Source: Preliminary AEO2013 run 10/03/2012

Domestic crude oil production by source, 1990-2040

U.S. crude oil production
million barrels per day

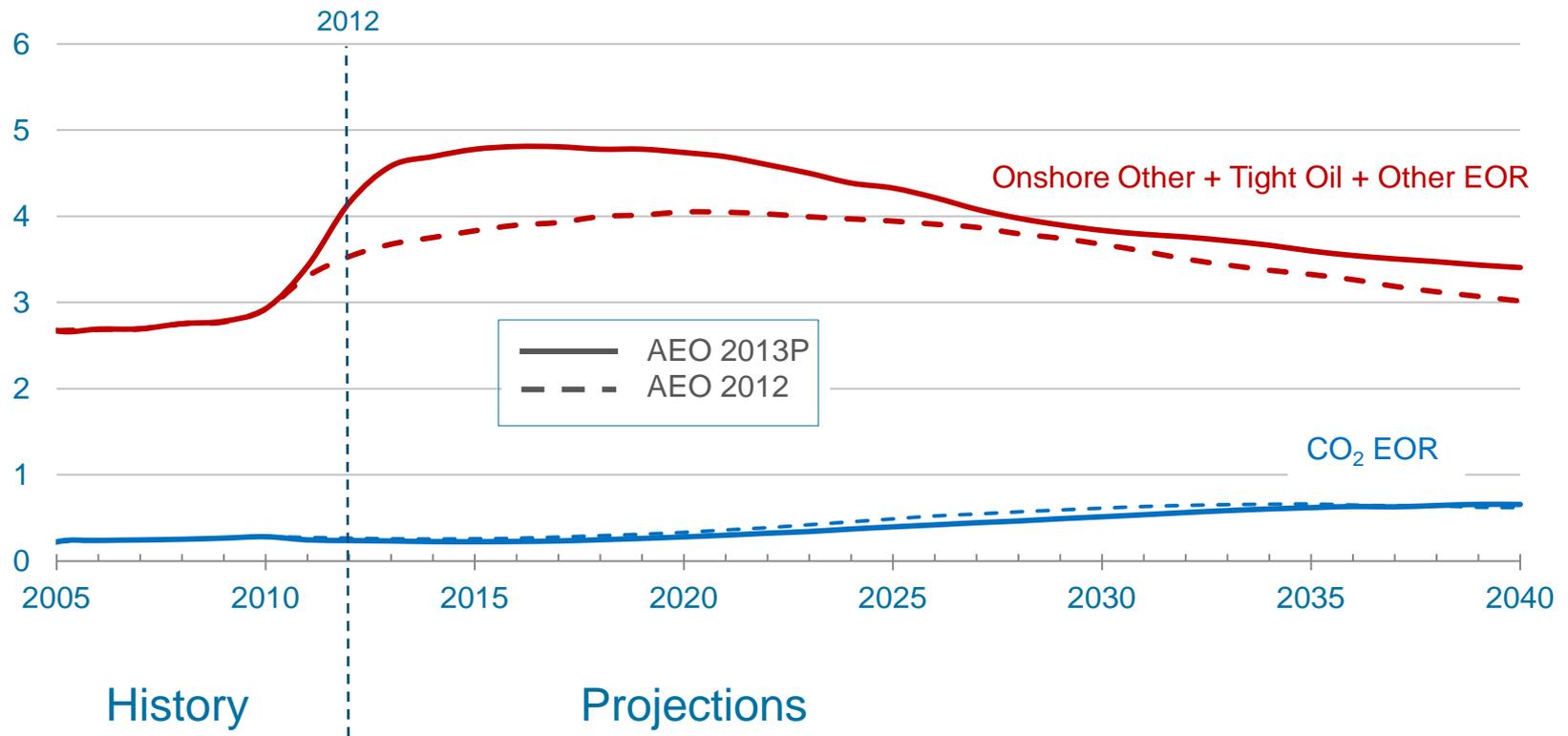
— AEO 2013P
- - - AEO 2012



Source: EIA, Annual Energy Outlook 2012, and AEO2013 Preliminary run 10/03/2012

Lower 48 onshore oil production, 2005-2040

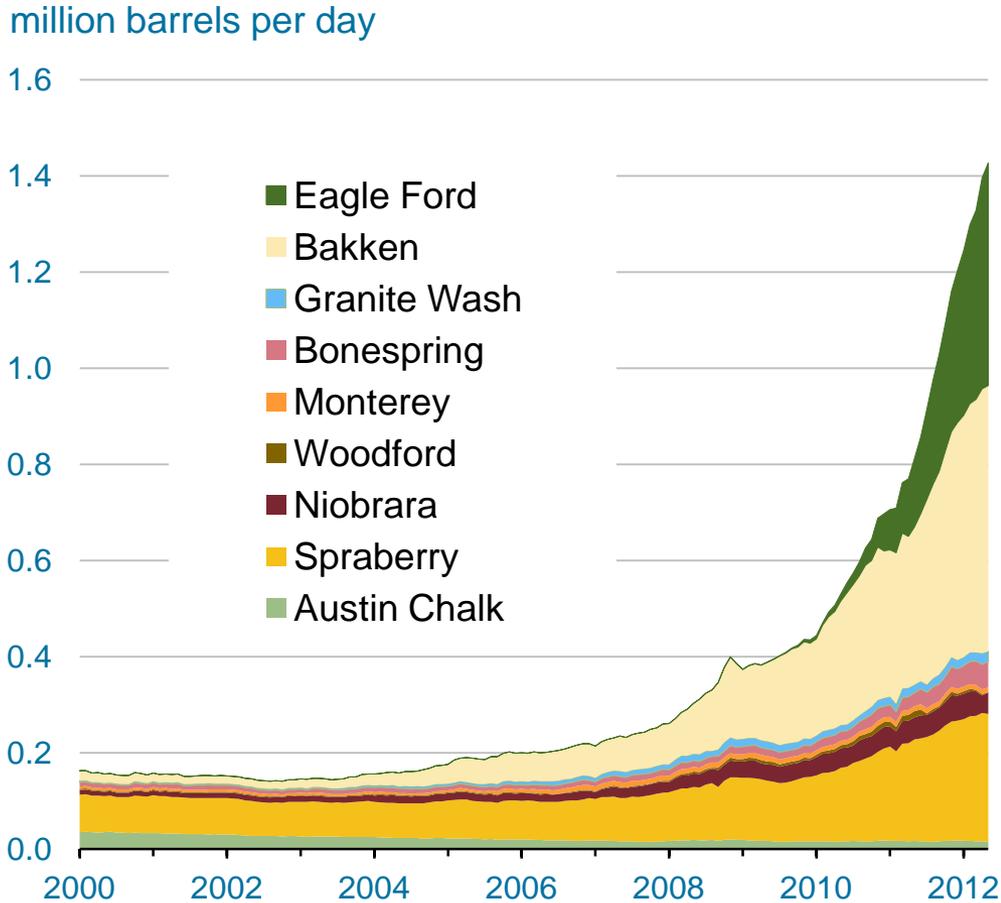
million barrels per day



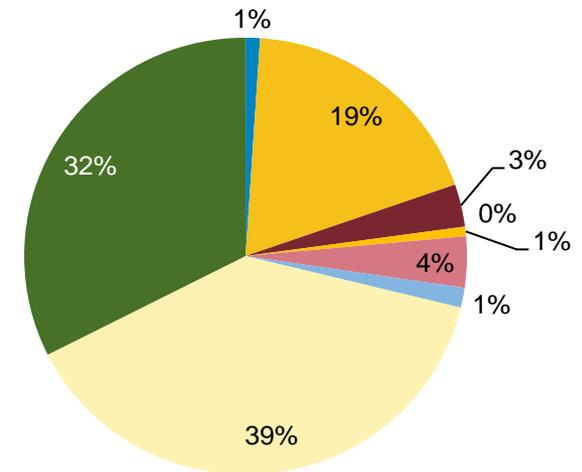
Source: Preliminary AEO2013 runs, dated as of 10/03/2012.

Note: Sum of two sets of lines equals L48 onshore total.

Tight oil production estimates



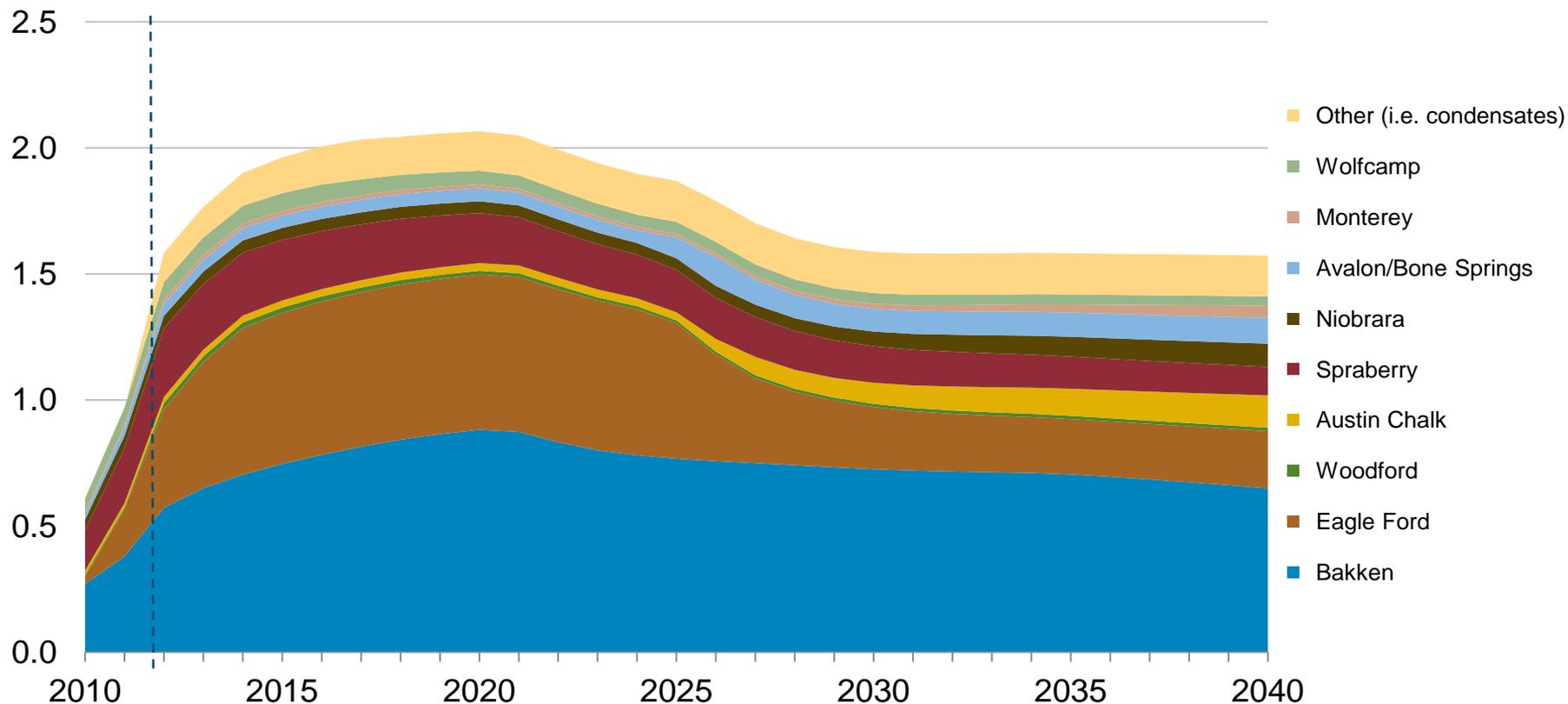
May 2012 Production



Source tight oil: HPDI, Texas RRC, North Dakota department of mineral resources, and EIA, through May 2012.

Projected crude oil production from tight oil plays in AEO 2013

million barrels per day



Source: Preliminary AEO2013 runs, dated as of 10/03/2012

Cumulative production in Bakken, Eagle Ford and Spraberry by 2040 is over 60% of current unproved TRR

| Selected plays million barrels | Tight Oil Unproved Resource | Cumulative Production 2008-2040 | Share of resource |
|-----------------------------------|-----------------------------------|---------------------------------------|----------------------|
| Bakken | 11,058 | 8,214 | 74% |
| Eagle Ford | 6,359 | 4,413 | 69% |
| Woodford | 537 | 167 | 31% |
| Austin Chalk | 7,096 | 705 | 10% |
| Spraberry | 3,418 | 2,062 | 60% |
| Niobrara | 6,503 | 682 | 10% |
| Avalon/Bone Springs | 1,763 | 824 | 47% |
| Monterey | 13,712 | 260 | 2% |
| Wolfcamp | 2,303 | 602 | 26% |
| Other (e.g. condensates, Utica,) | 13,307 | 1,654 | 12% |
| Total | 66,055 | 19,581 | 30% |

Source: Preliminary AEO2013 runs, dated as of 10/03/2012

For more information

U.S. Energy Information Administration home page | www.eia.gov

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