

**WORKING GROUP PRESENTATION FOR DISCUSSION PURPOSES.
DO NOT QUOTE OR CITE AS AEO2016 MODELING ASSUMPTIONS
AND INPUTS ARE SUBJECT TO CHANGE.**

Annual Energy Outlook 2016

1st Coal Working Group



Coal and Uranium Analysis Team

December 1, 2015 | Washington, D.C.

What's the schedule for release of EIA's products and the Coal Working Group?

- EIA's analysis of EPA's Draft Clean Power Plan (CPP) rule based on the AEO2015 Reference case was released as a service report on May 22, 2015
 - See: <http://www.eia.gov/analysis/requests/powerplants/cleanplan/>
- IEO2015 will be a full edition – tentative release date January 2016
- AEO2016 will be a full edition, but with a more limited number of side cases – tentative release date June 2016
- 2nd AEO2016 Coal Working Group will occur in early February 2016
- Mike Mellish will be retiring at the end of 2015
 - Diane Kearney will be the point of contact for the Coal Working Group going forward (Diane.Kearney@eia.gov, (202) 586-2415)

What's New for AEO2016?

- First use of newly-recoded Coal Market Module (CMM) from Fortran to AIMMS [ran in parallel in AEO2015]
- Implementation of the Final CPP in the Reference case
- Assessment of new EPA regulations affecting the coal sector
- Re-estimation and update of the underlying coal supply curve regressions in the CMM Coal Pricing Submodule (CPS) to incorporate data for 2010-2013
- Development of a more automated AEO - STEO benchmarking process
- Inclusion of final 2014 survey data and up-to-date capacity additions and retirement; related adjustments to productivity trends

What else is EIA working on?

- Re-estimating international coal export supply curves and equations for estimating ocean freight rates
 - Engaged team from Hellerworx to perform the work
 - Expected completion of initial phase by end of May 2016
 - Expect to incorporate by AEO2018
- Developing conceptual framework for addressing coal fleet aging by hosting a modeler's forum in 2016 as follow up to the EIA post-conference session
 - See: <http://www.eia.gov/forecasts/aeo/workinggroup/coal/>
- Changes to EIA survey forms
- Updating power-sector capital costs for technologies that either may have changed substantially or that are likely to be incorporated into NEMS

Legislation and Regulations

Model development activity will focus mainly on the EPA's Final CPP Rule

- AEO Reference case assumes current laws and final regulations
- EPA has promulgated several other power-sector regulations since AEO2015 that we will analyze and account for as necessary or as resources permit
 - Will require extensive data analysis and non-trivial NEMS code changes in the electricity model
 - Rely on EPA's detailed input cost estimates aggregating when necessary to preserve Confidential Business Information (CBI)
 - Assume EPA's population of affected plants is accurate
 - Pre-assume a method of compliance at the plant level consistent with EPA analysis
 - Assume a single year for compliance (specific date to be determined but by 2023)
- Several significant changes to state RPS policies will be incorporated, and the expiration dates for federal tax subsidies that have not been extended to-date will be monitored

EPA and the courts have been busy issuing or confirming regulations affecting the power sector

Regulation	AEO2015 Assumption	AEO2016 Assumption	Comment
Cross State Air Pollution Rule- CSAPR (SO ₂ /NO _x)	Clean Air Interstate Rule	Will model CSAPR	
Mercury and Air Toxics Program (Hg/SO ₃)	Models compliance with MATS requirements	Update retirements to match announced plans	Could have impact on CPP results
New Source Performance Standards limiting CO ₂ emissions from new plants (Clean Air Act S. 111b)	Not modeled	Will be included in Reference case	Part of CPP package; requires coal units to install USC with partial CCS to achieve max. rate of 1,400 lb CO ₂ /MWh
Regional Haze (Best Available Retrofit Technology)	Assumes compliance is reflected in EIA-860 filings on plants	Will re-assess for inclusion in AEO	Not expecting significant impact
Coal Combustion Residuals (Coal ash)	Not modeled	Will be included in Reference case	Not expecting significant impact (approx. 0.8 GW)
Cooling Water Intakes (Clean Water Act S. 316b)	Not modeled	Will evaluate for inclusion in AEO	Not expecting significant impact (approx. 1 GW)
Effluent Limitation Guidelines	Not modeled	Will evaluate for inclusion in AEO	Not expecting significant impact (approx. 1 GW)

Coal Combustion Residual (Coal Ash) Final Rule

- Final guidelines released April 2015
 - Rule sets national minimum criteria for the new and existing landfills and impoundments used for the disposal of coal ash.
 - All CCR units must monitor groundwater.
 - Impoundments and landfills that fail to meet location requirements or impoundments that fail to meet structural integrity requirements (i.e. those that pose the greatest risk) must close.
 - Some existing disposal sites may be required to retrofit or decide to close (avoiding all compliance costs) .
 - Unlined impoundments can continue to operate, but if unacceptable groundwater contamination occurs, they must retrofit or close. Similarly, unlined landfills can continue to operate but corrective action must occur to address any releases.
 - Coal ash will continue to be regulated as a non-hazardous waste under Subtitle D of the Resource Conservation Recovery Act.
 - Rule allows CCR products to remain unregulated if the CCR is encapsulated in a product having a beneficial use. This includes gypsum wallboard and concrete but specifically excludes the use of coal ash as ground fill.
 - Rule is unenforceable by EPA, but facilities that do not comply may be subject to litigation from other interested parties.
- Implementation timeline
 - Specific timelines vary depending on type of characteristics of CCR unit and compliance option chosen.
- EPA's estimate of electric power capacity retirements: ~ 0.8 gigawatts
- EPA's incremental cost estimate:
 - \$509-\$735 million annually (depending on discount rate)

Cooling Water Intakes (316(b)) Final Rule

- Final rule effective as of October 2014
 - Sets impingement controls for new and existing electric generating and manufacturing facilities with design intake flow of at least 2 million gallons per day (MGD) and use at least 25% of the water withdrawals for cooling.
 - Requires facilities having >125 MGD design intake flow to conduct studies to help permitting authorities determine what, if any, entrainment controls are needed.
 - Establishes a best technology available (BTA) standard for both impingement mortality and entrainment at new and existing facilities.
 - Existing BTA technologies for impingement include a closed cycle system, reduction of intake flows to 0.5 feet per second, minimum 800-foot distance offshore intakes with use of bar screens, or use of modified travelling screens.
 - BTA for entrainment will be determined on a site-specific basis.
 - Requires that new units must have the equivalent of closed loop cooling.
- Implementation time frame
 - Based on expiration of National Pollutant Discharge Elimination System (NPDES) permits but no later than 2023; a plan must be submitted by July 14, 2018.
 - Early choice of evaporative thermal cooling can allow implementation delay to 2023.
- EPA's estimated electric power capacity retirements: ~1 gigawatt
- EPA's estimated incremental costs:
 - \$275-297 million per year (excludes entrainment costs)

Effluent Limitation Guidelines

- Final guidelines released September 2015
 - Addresses liquid waste streams from plants (primarily coal plants) discharged directly and indirectly to water bodies (e.g. lakes, rivers)
 - In response to the transfer of pollutants from air to water as a result of the Clean Air Act
 - Regulates wastewaters associated with flue gas desulfurization, fly ash, bottom ash, flue gas mercury control, and gasification of fuels such as coal and petroleum coke
 - Addresses discharge of mercury, arsenic, selenium, nitrites/nitrate wastes from flue gas desulfurization equipment
 - Includes zero discharge pollution limits for ash transport water and flue gas mercury control water
- Implementation timeline
 - Effective as of January 2016
 - Compliance deadlines vary according to the expiration of the plant's National Pollutant Discharge Elimination System (NPDES) permit but will occur between 2018 and 2023.
- EPA's estimate of electric power capacity retirements: ~ 1 gigawatt
- EPA's incremental cost estimate:
 - \$471-\$480 million annually (depending on the discount rate)

Other laws and regulations affecting coal

- EPA's regional haze program is aimed at protecting national parks through implementation of Best Available Retrofit Technology (BART)
 - Requires states to lower NO_x and SO₂ emissions over time through state implementation plans (SIPs) or federal implementation plans (FIPs)
 - Implementation to occur between 2014 and 2018
 - Retrofits or retirements associated with finalized plans captured in reporting data
- California's cap-and-trade program (AB 32) and the Northeast's Regional Greenhouse Gas Initiative (RGGI) program
- California SB1368 that prohibits CA utilities from entering into long-term financial commitments for base load generation, unless it complies with the CO₂ emissions performance standard of 1,100 lbs/MWh
 - Reduce firm imports to represent expiration of contracts with the Four Corners, Navajo, Reid Gardner, San Juan, and Boardman plants and retire Intermountain in 2025
 - Adjust carbon emission rate for firm imports in accordance with the expiration of contracts
- The 3% adder on the cost of capital for upgrades to coal units without *maximum* sequestration options included to account for risk of future tightening of CO₂ emissions standards and other policies affecting coal

Monitoring proposed regulatory actions

- **California post-2020 Greenhouse Gas (GHG) emissions target**
 - EO-S-3-05 (2005) requires California to reduce its emissions to 20% of 2020 levels by 2050.
 - Guidelines for meeting post-2020 targets are expected in 2017.
- **OSM’s Stream Protection Rule (Proposed in July 2015)**
 - Affects surface mines and underground mines that impact the surface.
 - Requires pre-mining collection of data to establish baseline environmental conditions.
 - Specifies that mining area must be returned to a condition appropriate for its pre-mining use.
 - Requires permits to specify maximum acceptable material damage levels from the mine operation.
 - Earliest implementation date: January 2017
- **EPA’s “Waters of the United States” (Final as of June 2015, but subject to court stay in October 2015)**
 - Expands scope of “waters of the United States” (WOTUS) that are protected under the Clean Water Act.
 - Key changes relate to tributaries, adjacent wetlands, and “other waters.”
 - Coal industry concerns include permitting delays.
- **Potential changes to the federal coal leasing program**
 - DOI held recent listening sessions.
- **Outcome of coal export terminal permitting processes**

General Modeling Assumptions

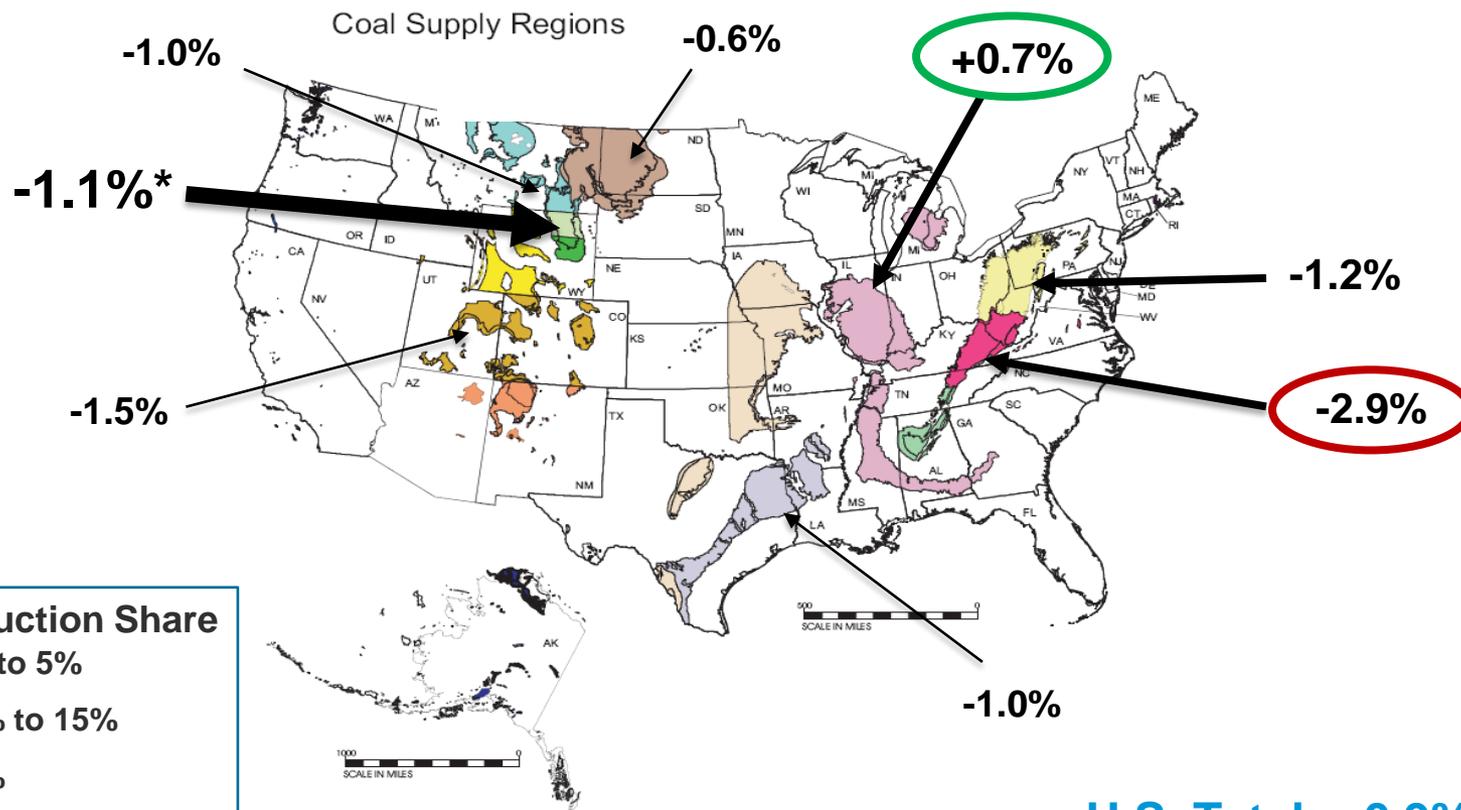
Average annual growth in coal mining labor productivity for selected supply regions (percent)

Coal Supply Region	1980 - 2013			Recent year-over-year changes			AEO2015 projections
	1980-1990	1990-2000	2000-2013	2011-2012	2012-2013	2013-2014	2013-2040
Northern Appalachia	5.4	5.5	-2.2	-4.9	3.7	11.2	-1.2
Central Appalachia	7.3	4.4	-5.2	-3.8	3.1	5.5	-2.9
Eastern Interior	4.8	3.7	-0.2	6.1	7.1	0.9	0.7
Gulf Lignite	2.6	2.4	-2.8	-4.2	-1.2	0.9	-1.0
Dakota Lignite	6.0	1.0	-3.3	-4.8	-1.7	0.7	-0.6
Western Montana	4.6	2.0	-2.4	-11.7	15.4	-0.9	-1.0
WY, Northern Powder River Basin	7.5	3.2	-3.2	-5.7	-2.6	3.2	-1.1
WY, Southern Powder River Basin	7.2	4.9	-2.4	-6.4	4.9	1.3	-1.1
Rocky Mountain	7.8	5.5	-2.4	3.5	1.3	9.3	-1.5
U.S. Average	7.1	6.2	-1.8	-0.2	6.7	7.6	-0.9

Source: History: U.S. Energy Information Administration (EIA), *Annual Coal Report*, and Mine Safety and Health Administration, Form 7000-2, "Quarterly Mine and Employment and Coal Production Report;"

Projections: AEO2015 Reference Case (April 2015).

Average annual growth in coal mining labor productivity from 2013 to 2040 in AEO2015 for selected supply regions (percent)



* Includes production from all mines in Wyoming's Powder River Basin.

Source: 2012 Production Shares : Mine Safety and Health Administration, Form 7000-2, "Quarterly Mine and Employment and Coal Production Report;"

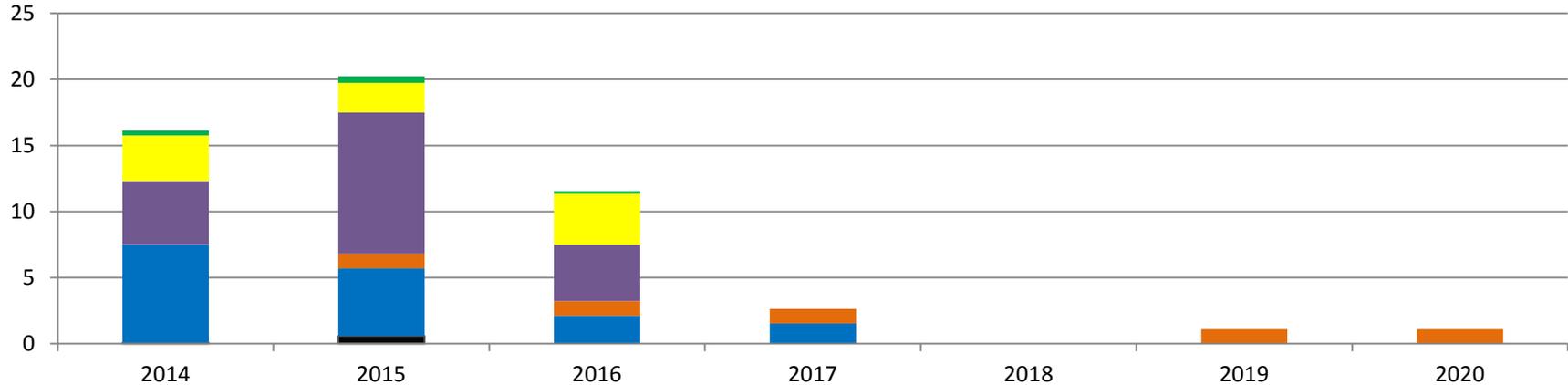
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Initial Assessment shows planned additions of new capacity are fairly consistent between AEO2016 and AEO2015

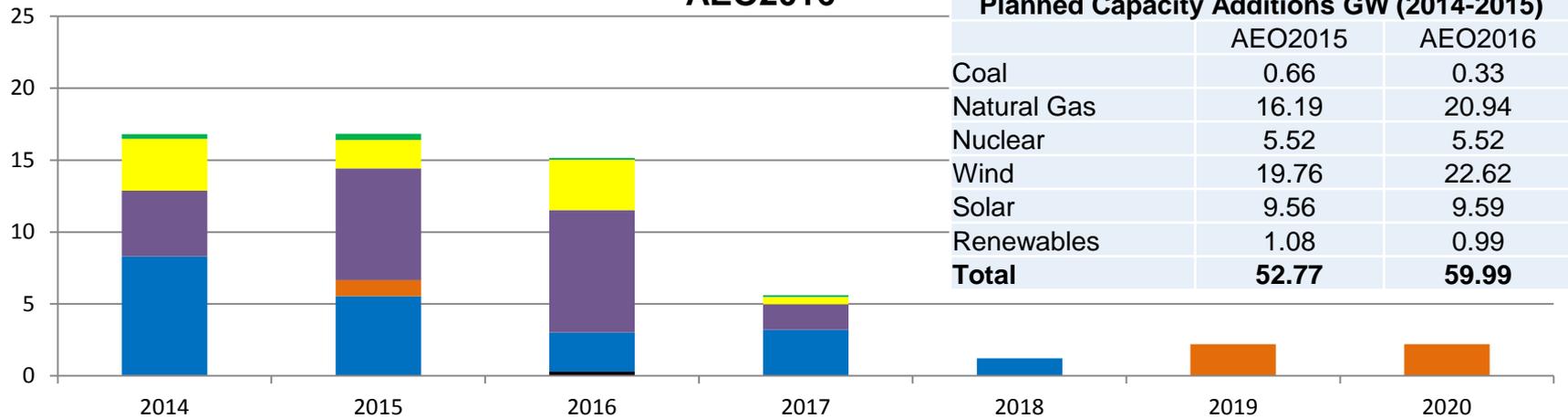
AEO2015

Gigawatts

■ Coal ■ Natural Gas ■ Nuclear ■ Wind ■ Solar ■ Renewables



AEO2016

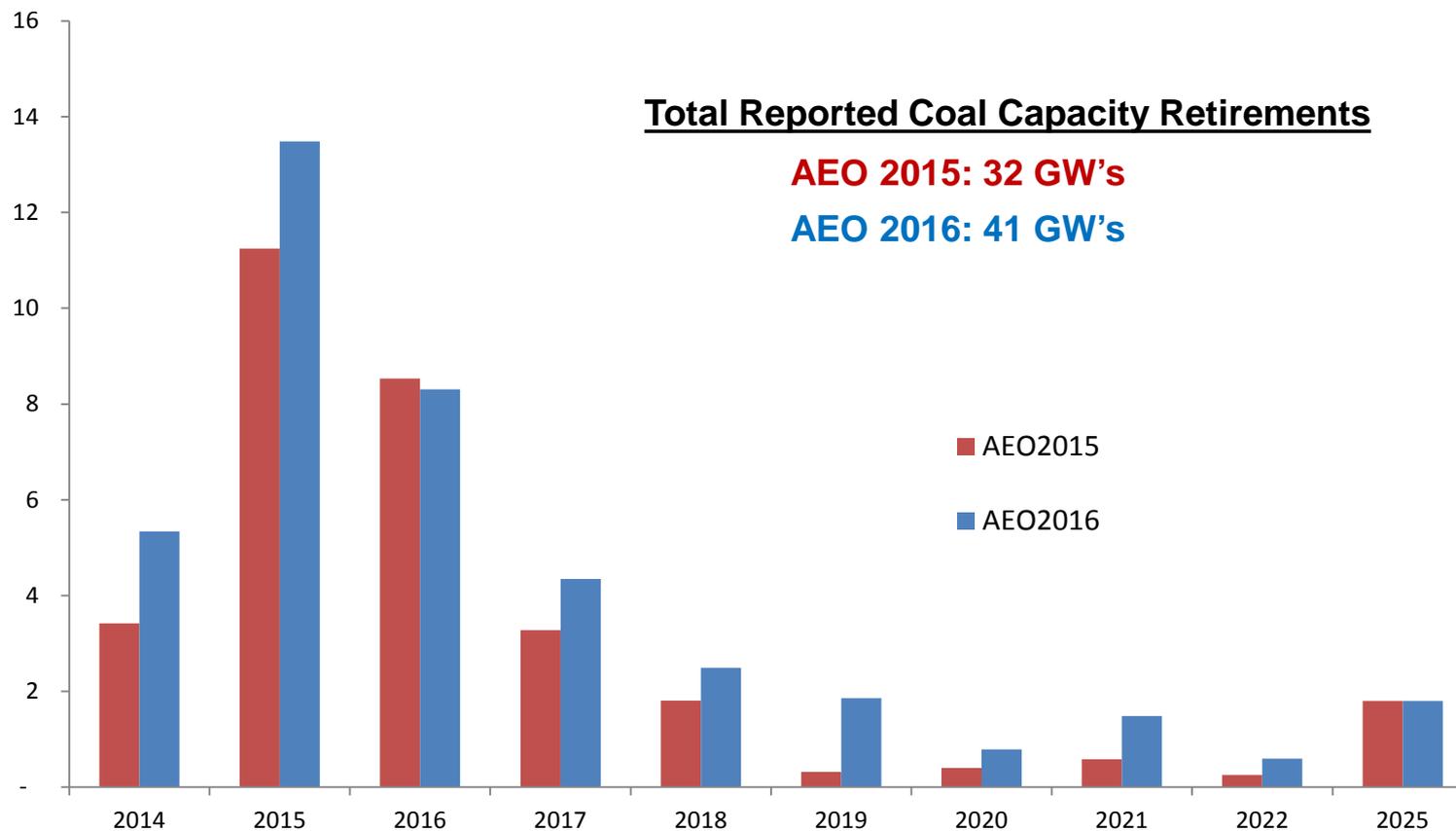


Planned Capacity Additions GW (2014-2015)

	AEO2015	AEO2016
Coal	0.66	0.33
Natural Gas	16.19	20.94
Nuclear	5.52	5.52
Wind	19.76	22.62
Solar	9.56	9.59
Renewables	1.08	0.99
Total	52.77	59.99

Initial assessment shows that coal retirements are higher for AEO2016 than AEO2015

Gigawatts



Coal-fired capacity additions: recent completions and units under construction (megawatts)

FACILITY CODE	PLANT NAME	GENERATOR ID	STATE	PLANT TYPE	ENERGY SOURCE	START YEAR	START MONTH	SUMMER CAPABILITY
56786	Spiritwood	1	ND	PC	LIG	2014	11	52
Included as existing capacity for 2014 in AEO2016:								52
6288	Healy	2	AK	PC	LIG	2015	12	50
57037	Kemper County IGCC Project	1A,1B,1C	MS	IGCC	LIG	2016	6	555.2
Included as planned capacity additions in AEO2016:								605.2

Source: U.S. Energy Information Administration, Form EIA-860 “Annual Electric Generator Report”

Coal-Fired Capacity Reported as Planned but Not Yet Under Construction on the Form EIA-860 (megawatts)

FACILITY CODE	PLANT NAME	GENERATOR ID	STATE	PLANT TYPE	ENERGY SOURCE	START YEAR	START MONTH	SUMMER CAPABILITY
55360	Two Elk Generating Station	GEN1	WY	PC	WC	2016	12	275
56452	Medicine Bow Fuel & Power LLC	1	WY	CTL	BIT	2019	12	350
56675	Plant Washington	MAIN	GA	PC	SUB	2021	4	850
Total Capacity								1,475

Note: Because these units are reported as not yet under construction on the Form EIA-860, these units are not included as planned capacity additions in the AEO2016.

Source: U.S. Energy Information Administration, Form EIA-860 “Annual Electric Generator Report”

Review of AEO2015 Reference Case (April 2015)

Current trends already having an impact on coal consumption even before the CPP

- Nationally

- Slowing growth in electricity demand
- Competition with relatively low-cost natural gas
- Increasing competition with renewable energy
- Compliance with the Mercury Air Toxics Standard (MATS)
- High plant construction costs relative to natural gas

- Regionally

- Central Appalachia encountering thinning seams and reserve depletion
- Illinois Basin coals competing more effectively as plants add SO₂ controls
- Coal export markets weakening

Key results for the AEO2015 Reference case

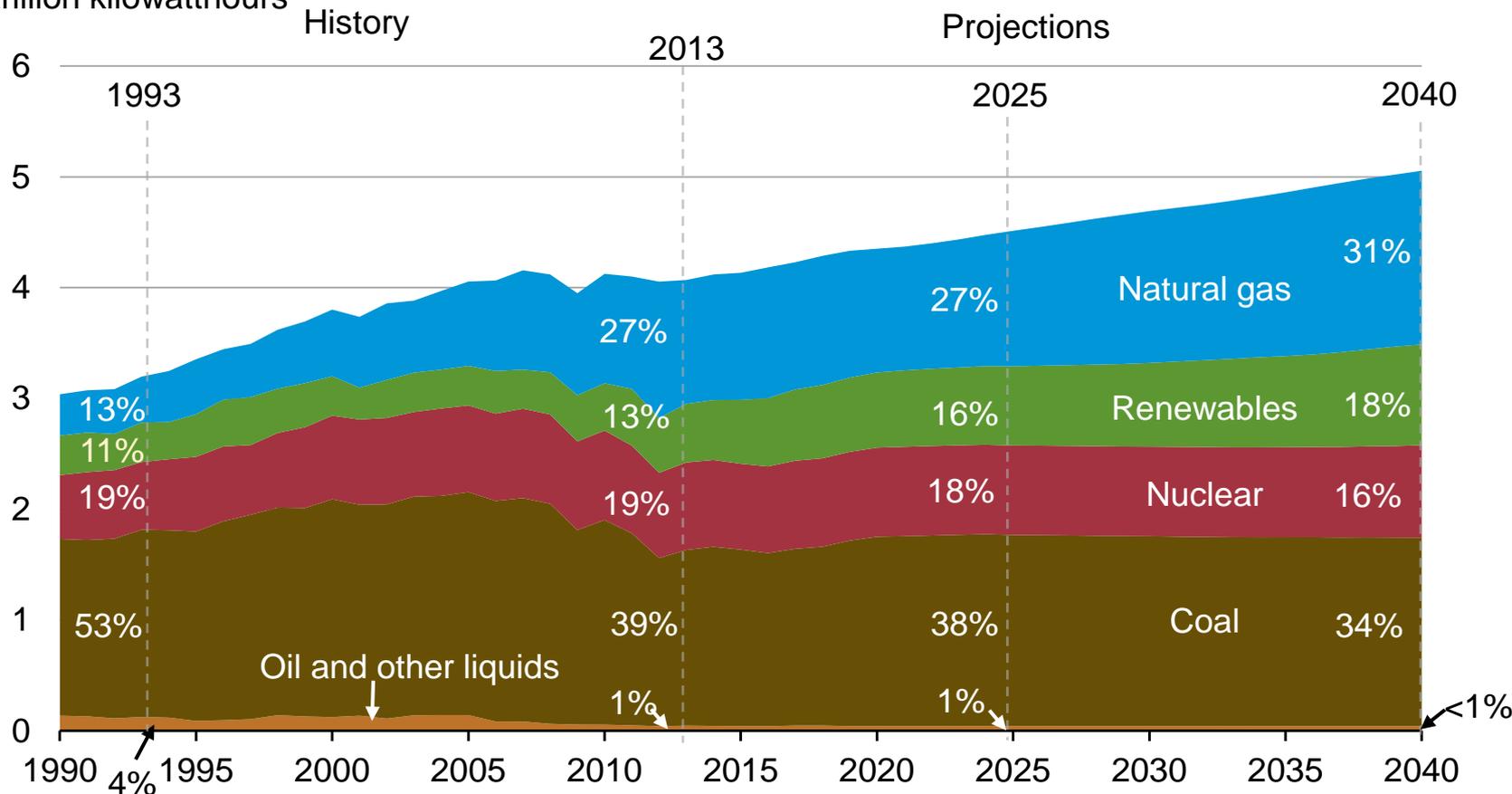
- Coal is the leading fuel for U.S. electricity generation in 2040. But, coal's share of total generation decreases over time to 34% in 2040 from 39% in 2013.
- The Interior region increases both production and share of total production.
 - Coal producers in the Interior region gain share while Appalachia loses share of total U.S. coal production. From 2013 to 2040, the Appalachian region's share of total coal production (on a Btu basis) falls from about 35% to 27%.
 - From 2013 to 2040, Interior coal production rises by 113 million tons while West production rises by 59 million tons.
- Much of the 40 GW of coal-fired capacity retirements occur by 2016 largely because of the combination of MATS, relatively low natural gas prices, and relatively low electricity demand. (32 GW have been reported to EIA.)

Key results for the AEO2015 Reference case

- Expanding development of shale gas resources drives increased production and competitive prices for natural gas.
- In the years around MATS implementation (2016), coal use is low compared to history. But, as overall electricity demand and natural gas prices rise, coal use also increases. Coal consumption is steady -- about 1 billion tons in the 2020 time frame and then remains at about 990 million tons after 2030.
- Between 2015 and 2040, coal exports rise by about 60 million tons – predicated on rising demand for coal internationally.
- 1.1 GW of coal capacity additions (0.7GW planned)
- Delivered coal prices increase gradually through 2040 at an average rate of 0.7% per year (on a per ton basis) due to declining coal mine productivity and slightly higher transportation costs.

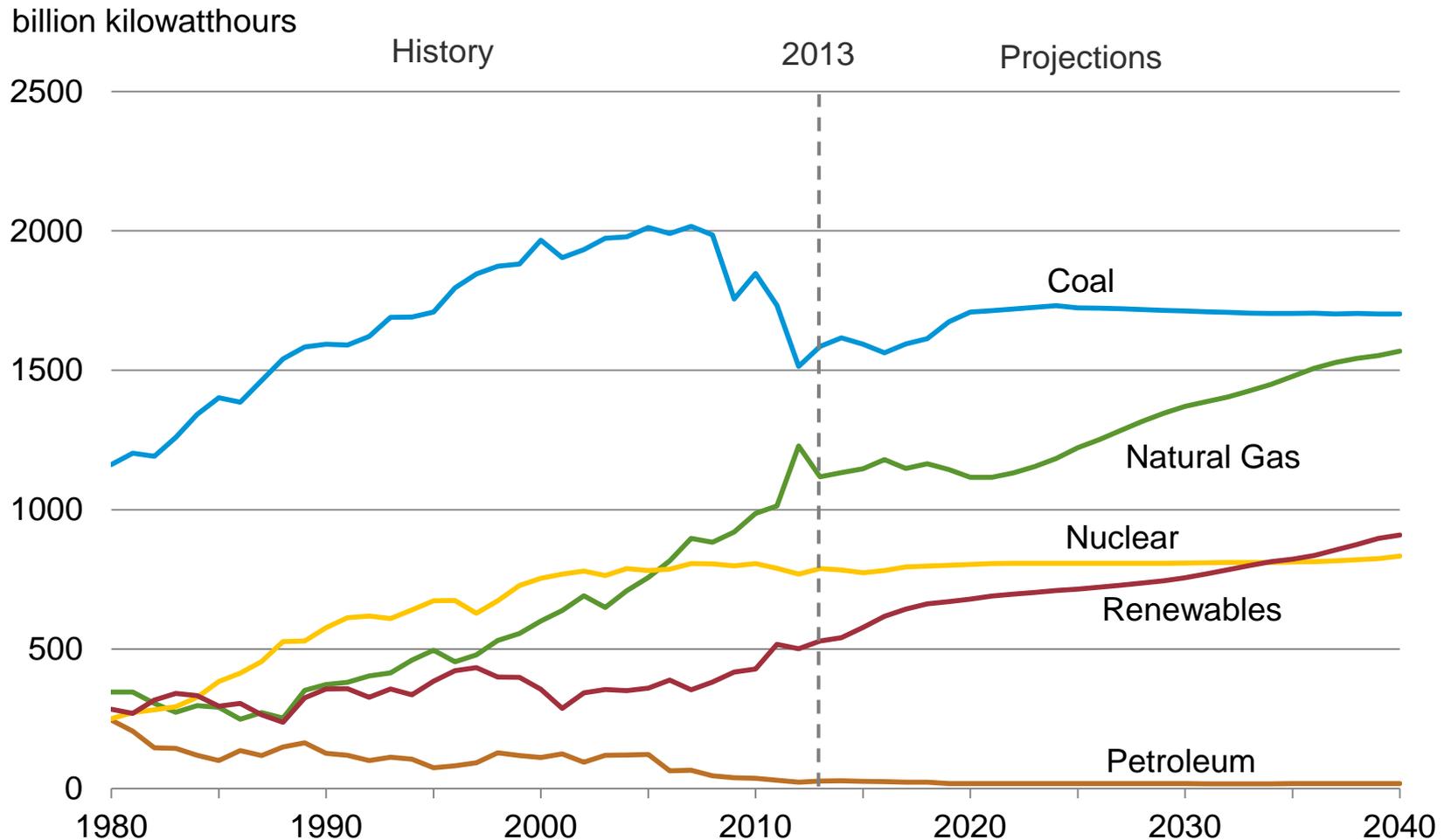
Over time the electricity mix gradually shifts towards larger shares of natural gas and renewable generation

U.S. electricity net generation
trillion kilowatthours



Source: EIA, Annual Energy Outlook 2015

Electricity Generation by Fuel, 1980-2040



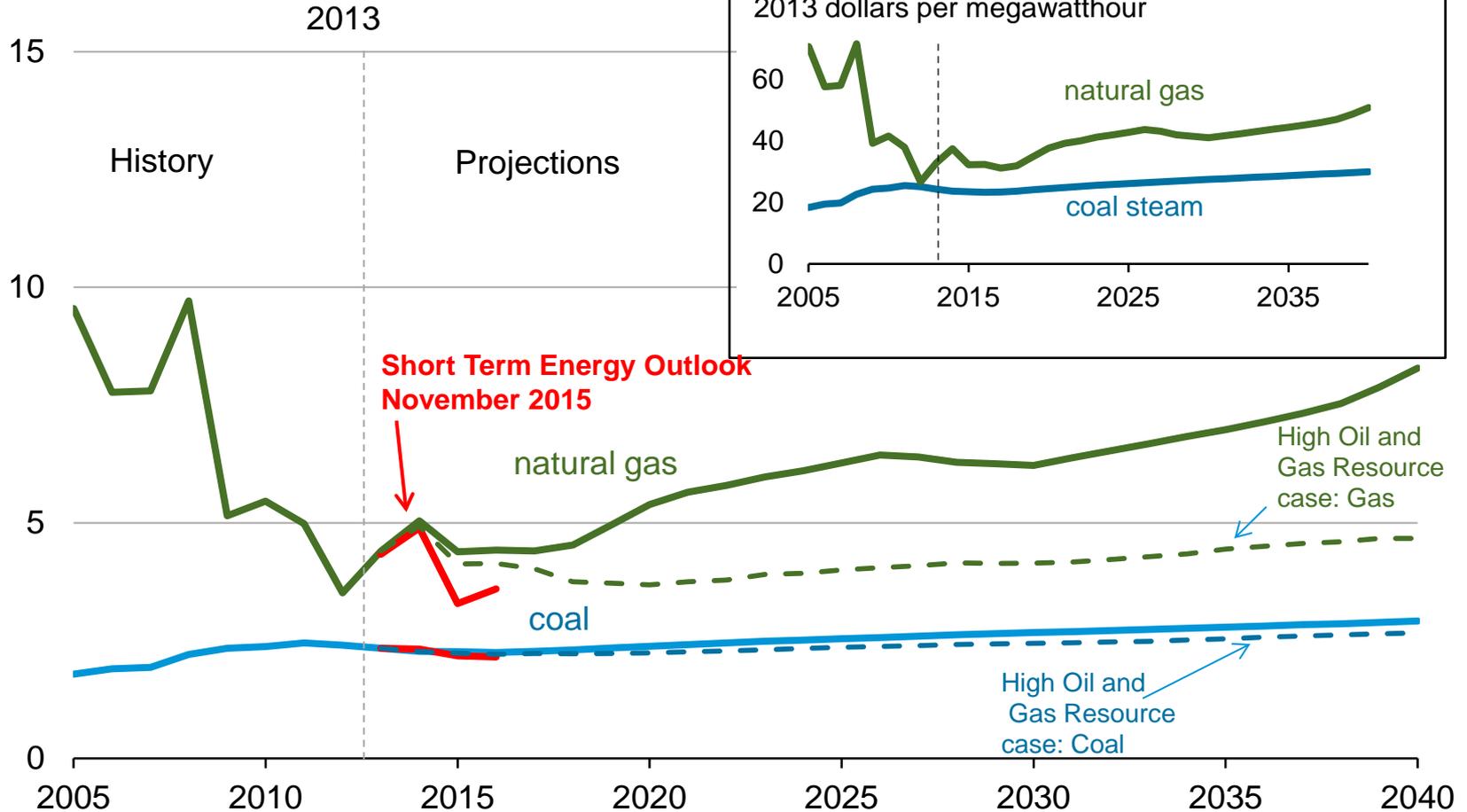
Note: Includes generation from plants in both the electric power and end-use sectors.

Source: History: U.S. Energy Information Administration (EIA), *Annual Energy Review*;

Projections: AEO2015 Reference Case (April 2015).

Delivered prices of natural gas and coal to the electric power sector in the Reference case

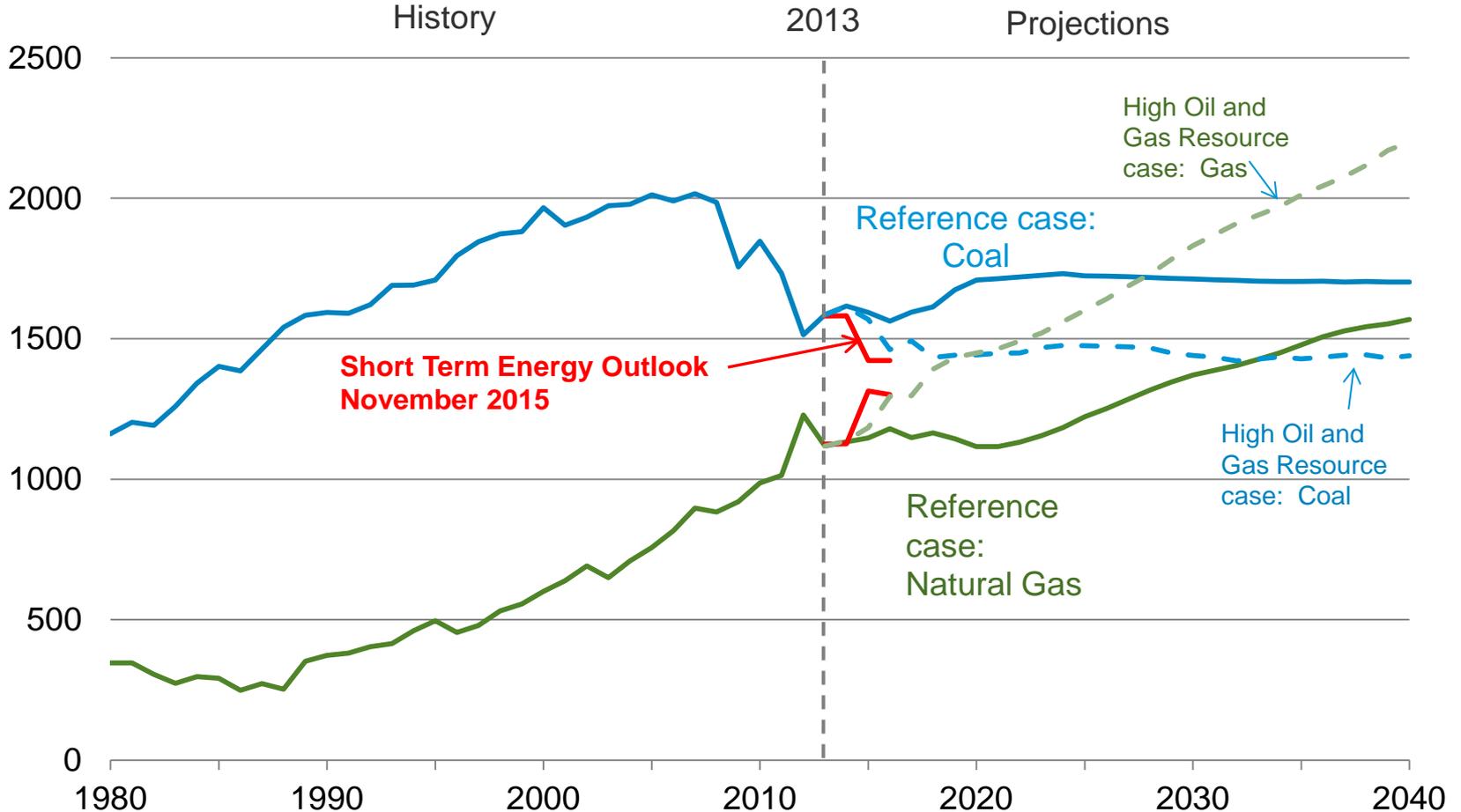
average delivered fuel prices to electric power plants, 2013 dollars per million Btu



Source: AEO2015 Reference case (April 2015).

Electricity Generation for Coal and Gas in the Reference case and the High Oil and Gas Resource Case, 1980-2040

billion kilowatthours

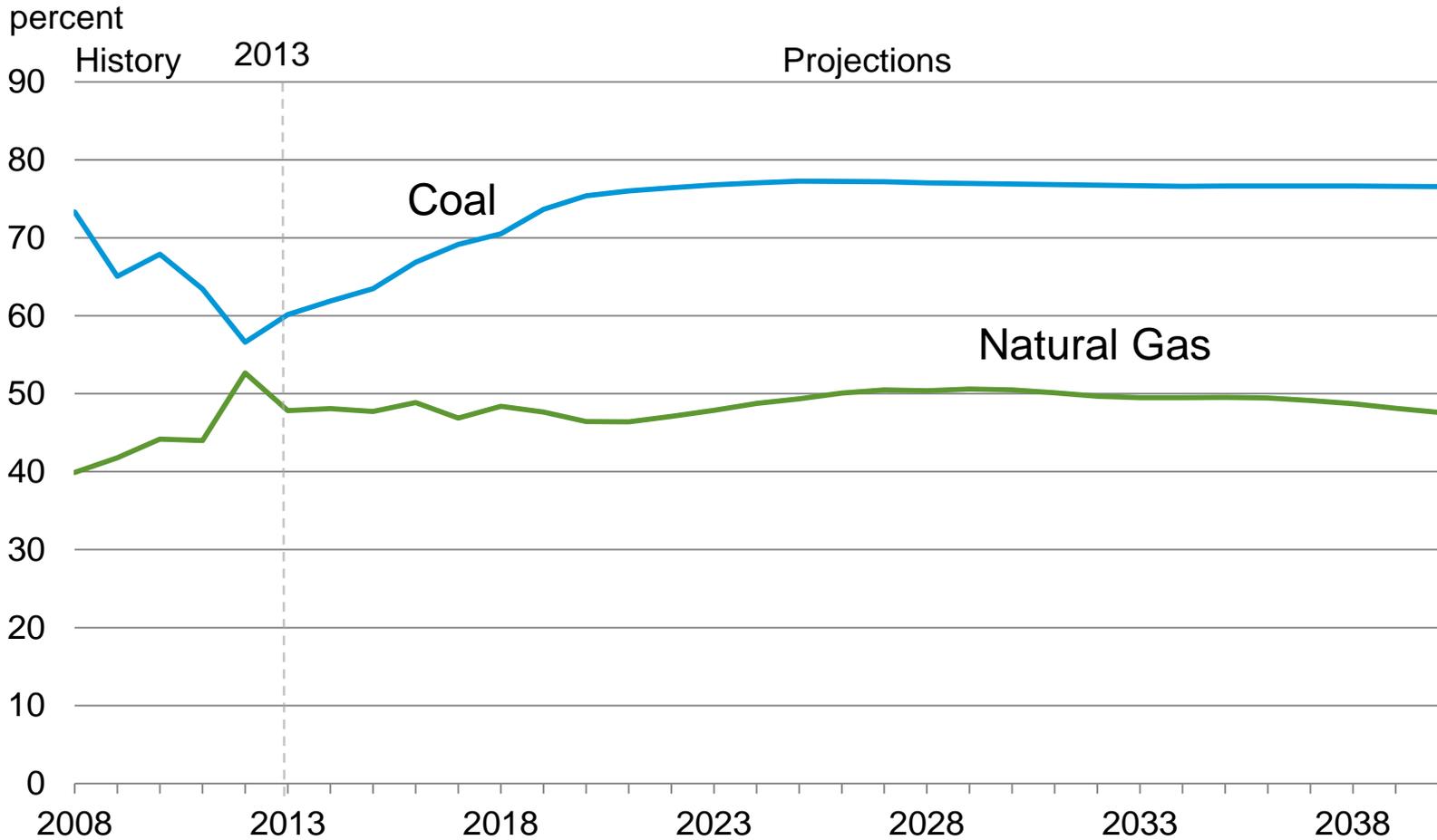


Note: Includes generation from plants in both the electric power and end-use sectors.

Source: History: U.S. Energy Information Administration (EIA), *Annual Energy Review*;

Projections: AEO2015 Reference Case (April 2015).

Average capacity utilization of natural gas combined cycle and coal generating capacity, 2008-2040



Source: AEO2015 Reference Case (April 2015)

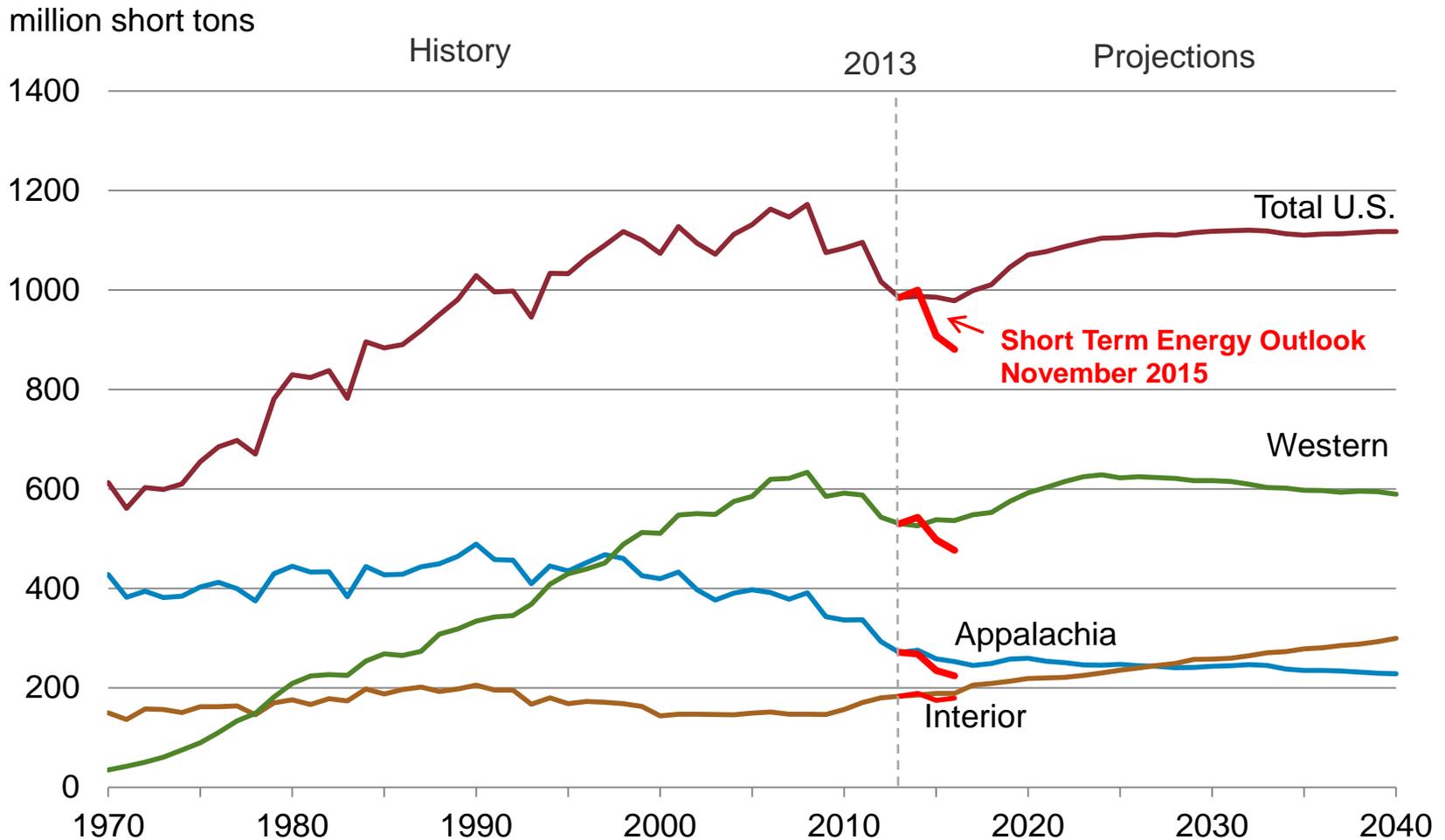
Electric Net Summer Generating Capacity by Fuel, 2008-2040 (gigawatts)

Fuel	2008	2011	2013	2015	2016*	2020	2030	2040
Coal	311	316	304	290	269	263	260	260
Electric Power Sector	308	313	300	286	266	260	257	257
End-Use Sectors	4	4	3	3	3	3	3	3
Natural Gas & Petroleum	450	463	470	480	486	482	519	595
Nuclear Power	101	101	99	100	100	101	102	105
Renewable Sources	117	143	167	192	202	207	227	275
Other (includes pumped storage)	25	25	25	26	26	26	26	26
Total	1004	1049	1065	1085	1082	1079	1133	1261

Source: AEO2015 Reference Case (April 2015)

**MATS compliance assumed to begin*

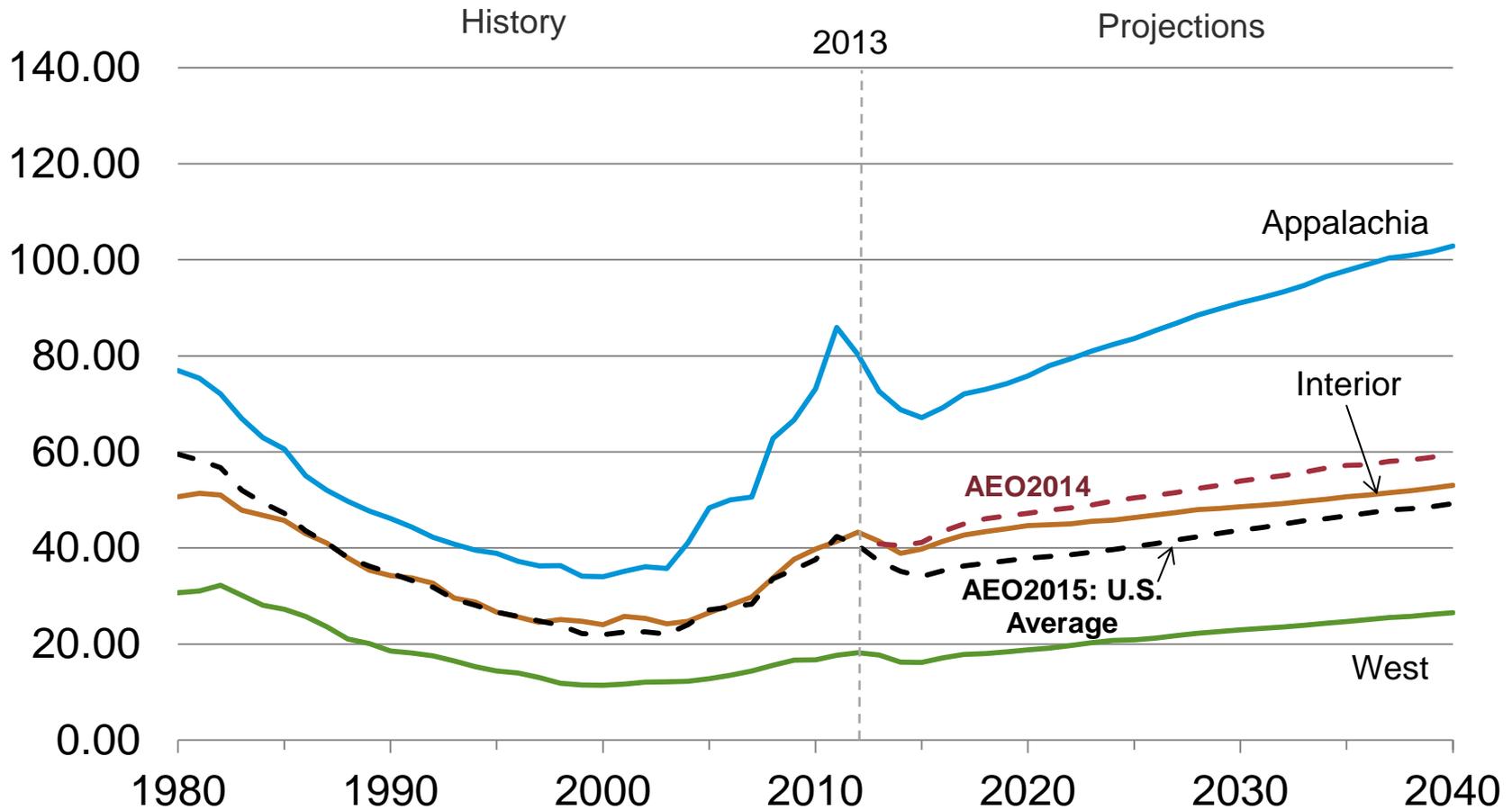
Coal production by region, 1970-2040



Source: AEO2015 Reference Case (April 2015)

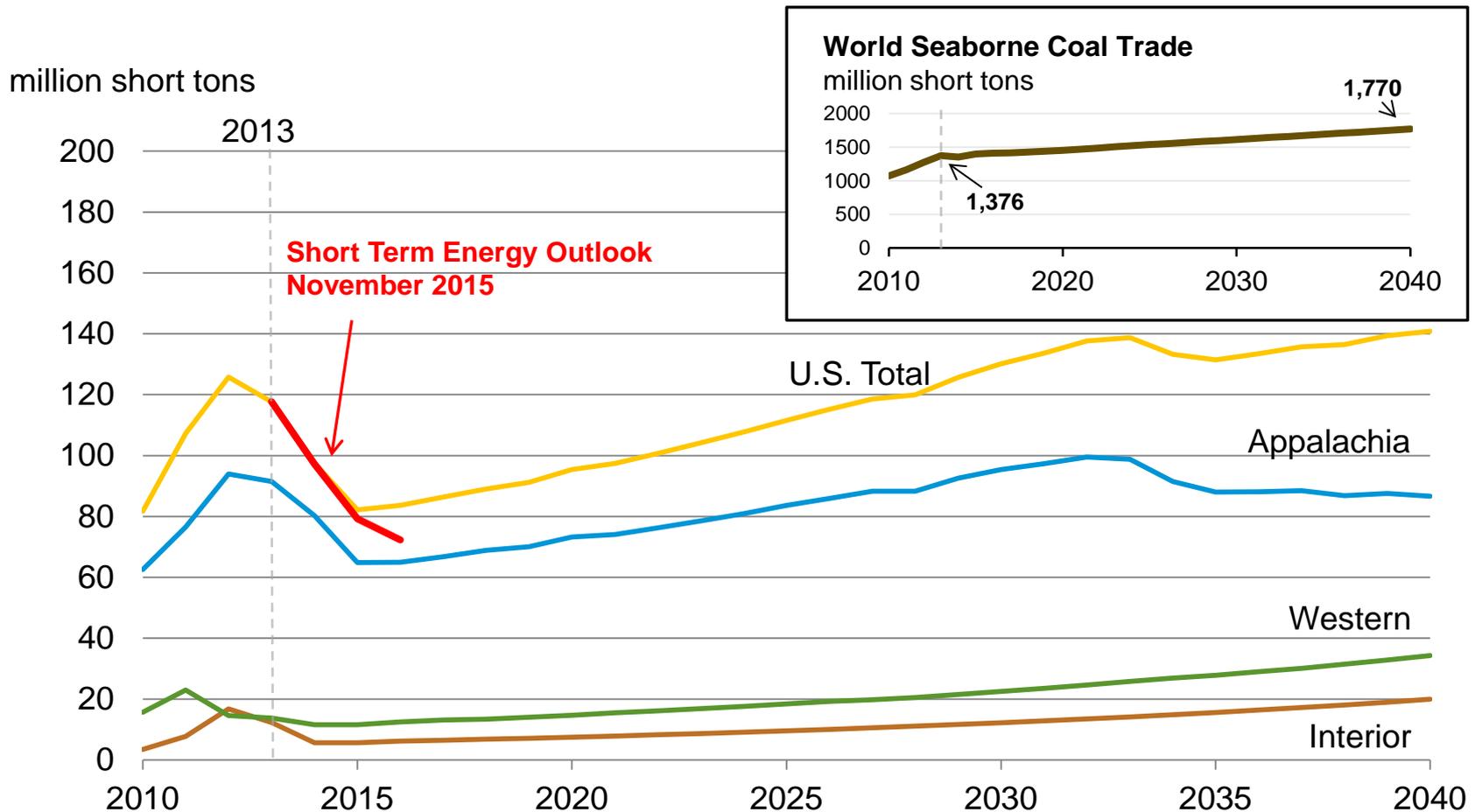
Average minemouth coal prices by region, 1980-2040

2013 dollars per short ton



Source: AEO2015 Reference Case (April 2015) and AEO2014 Reference Case (April 2014)

Coal exports by major supply region, 2010-2040



Source: 2010-2012: U.S. Energy Information Administration (EIA), Annual Coal Distribution Report;
2013-2040: AEO2015 Reference Case (April 2015).

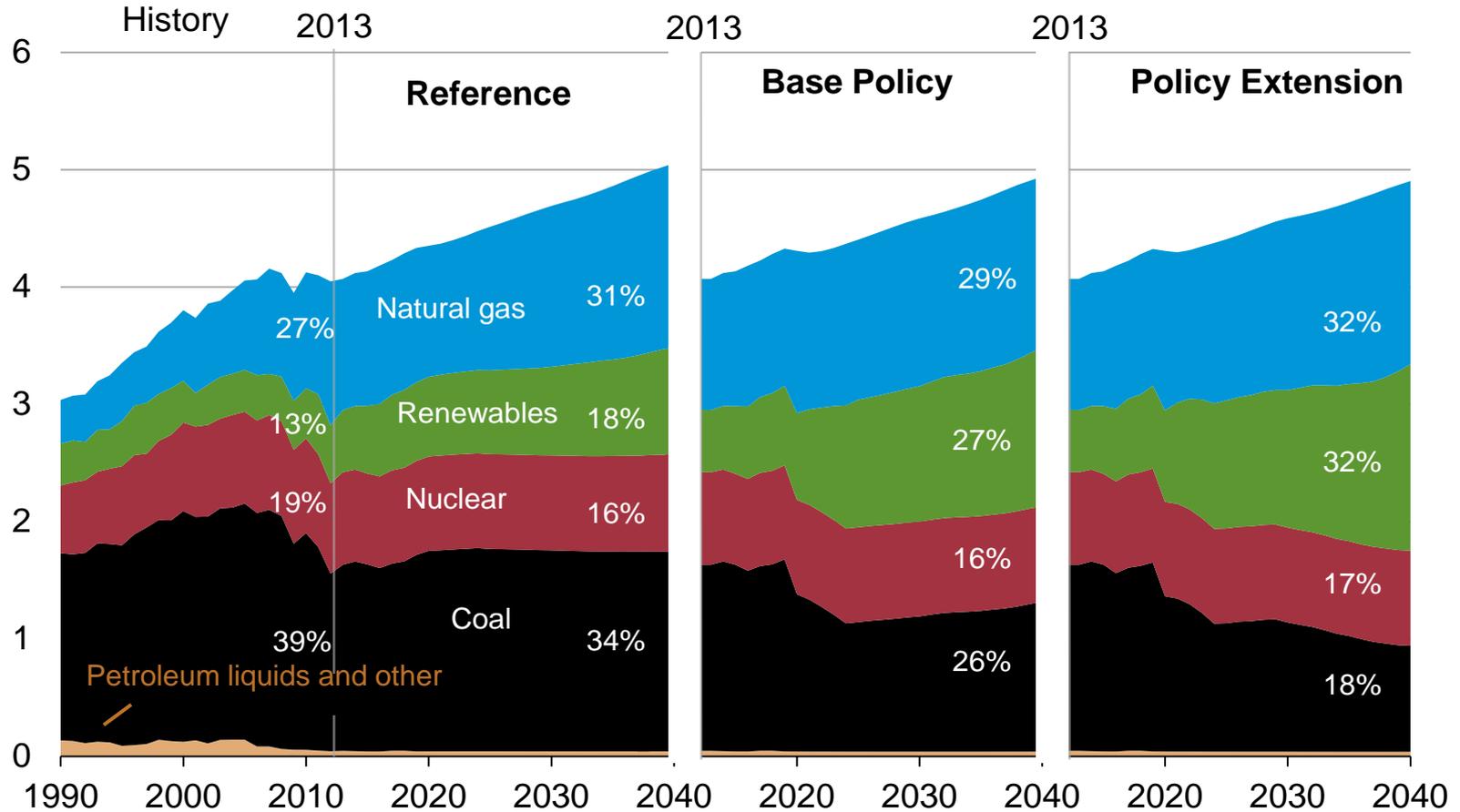
Review of Analysis of Draft Clean Power Plan Rule (May 2015)

Draft EPA Clean Power Plan (CPP) cases considered by EIA demonstrate potential impacts that may occur under the Final Rule

Case name	Description
Reference (AEO)	EIA's <i>AEO2015</i> Reference case presents long-term annual projections of energy supply, demand, and prices through 2040. The Reference case is based generally on federal, state, and local laws and regulations in effect as of the end of October 2014.
Policy Cases	<i>Regional CO₂ emission intensity targets were developed and added as a modeling constraint, based on specified state-level CO₂ emission intensity targets.</i>
Base Policy (CPP)	The Base Policy case models the proposed Clean Power Plan using the <i>AEO2015</i> Reference case as the underlying baseline, allowing regions to choose compliance strategies endogenously from among the four building blocks in EPA's proposed Best System of Emissions Reduction.
Policy Extension (CPPEXT)	The Policy Extension case extends CO ₂ reduction targets beyond 2030, in order to reduce CO ₂ emissions from the power sector by 45% below 2005 levels in 2040, using the <i>AEO2015</i> Reference case as the baseline.
Policy with New Nuclear (CPPNUC)	The CPPNUC case assumes that generation from new nuclear power plants that are not currently under construction is counted in compliance calculations in the same manner as new renewable generation.

The proposed CPP rule causes a significant reduction in generation from coal

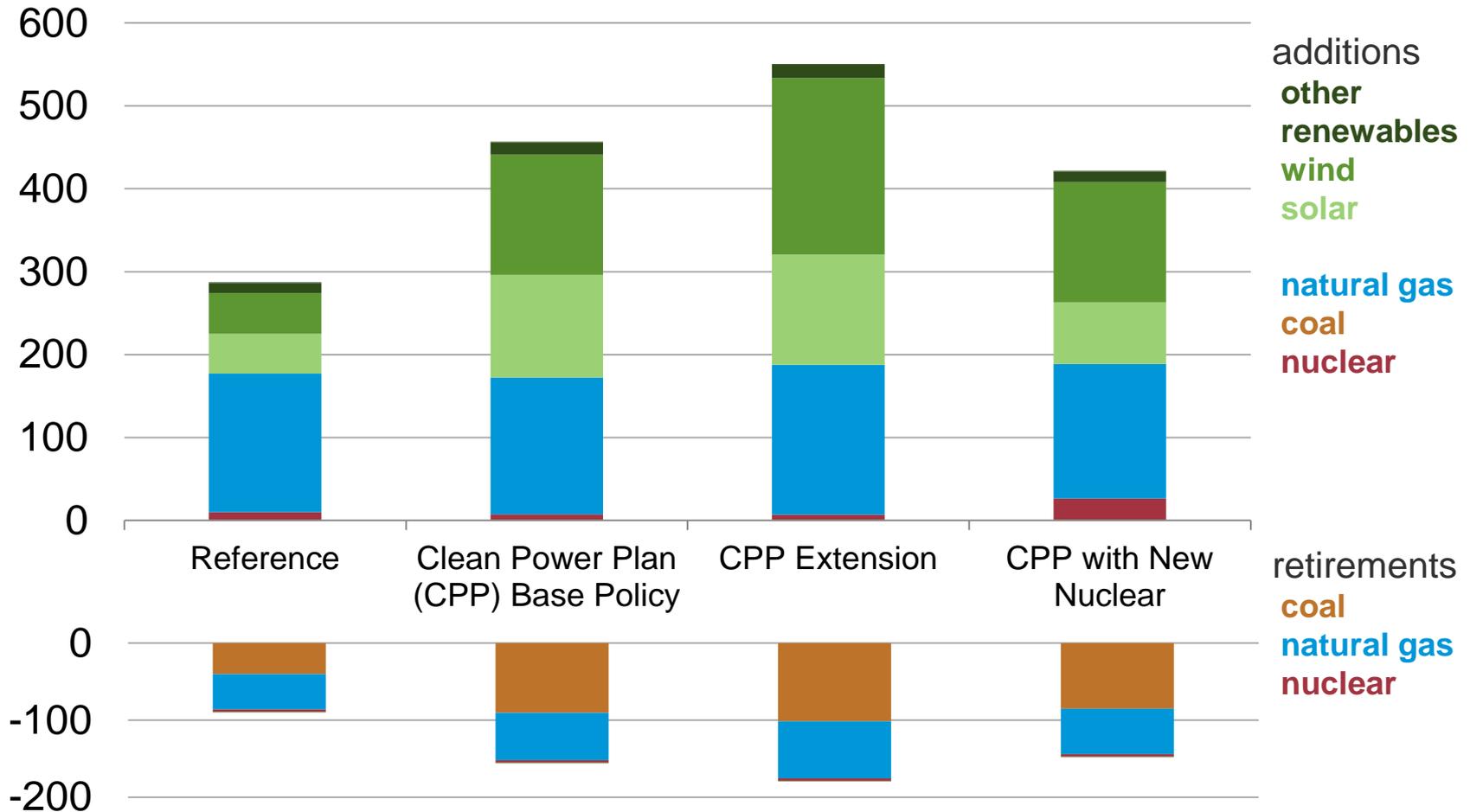
total electricity generation
trillion kilowatthours



Source: EIA, Annual Energy Outlook 2015 and Analysis of Impacts of the Clean Power Plan, May 2015

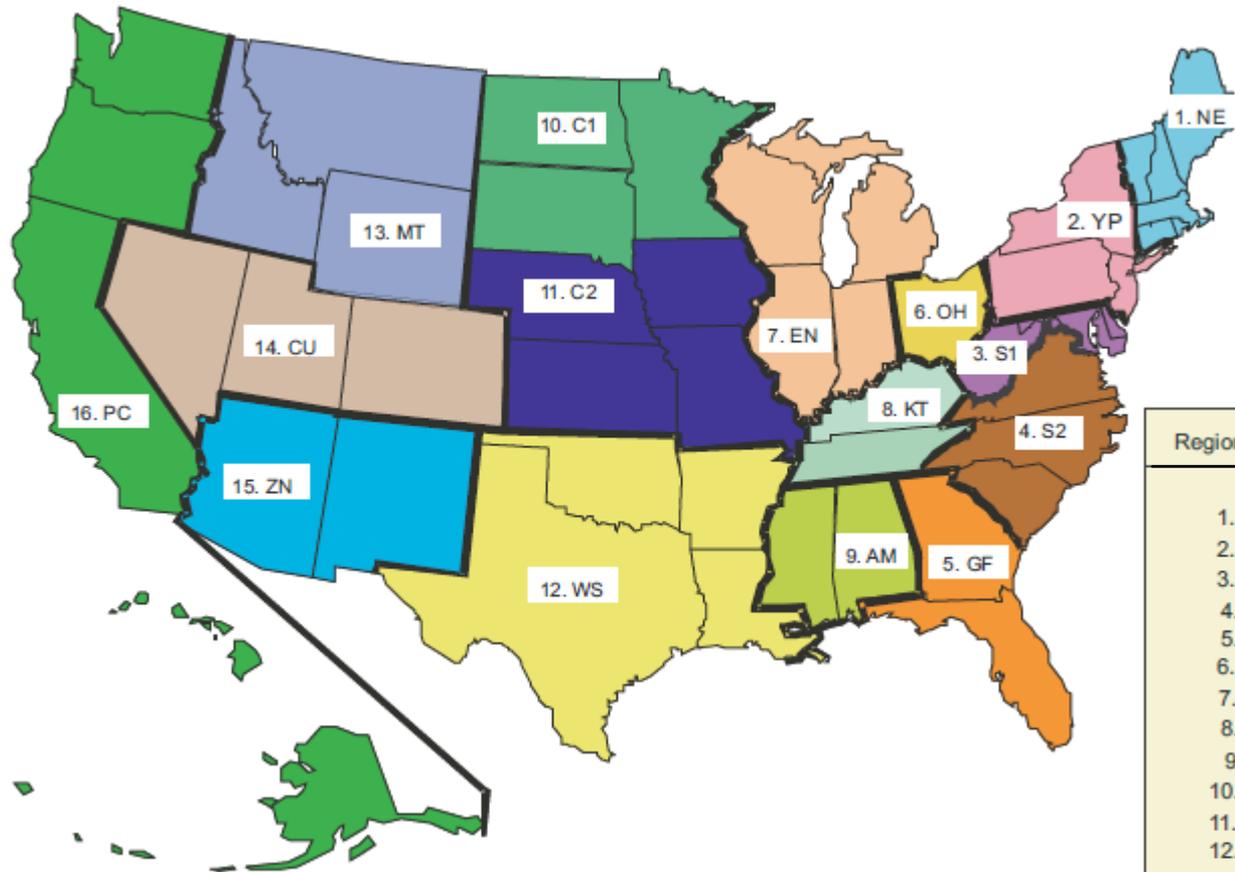
From 2014-2040, CPP case retirements (mostly coal) are 66 GW above Reference; renewable capacity adds are 174 GW above Reference

Cumulative additions and retirements, 2014-40
gigawatts



Source: EIA, Annual Energy Outlook 2015 and Analysis of Impacts of the Clean Power Plan, May 2015

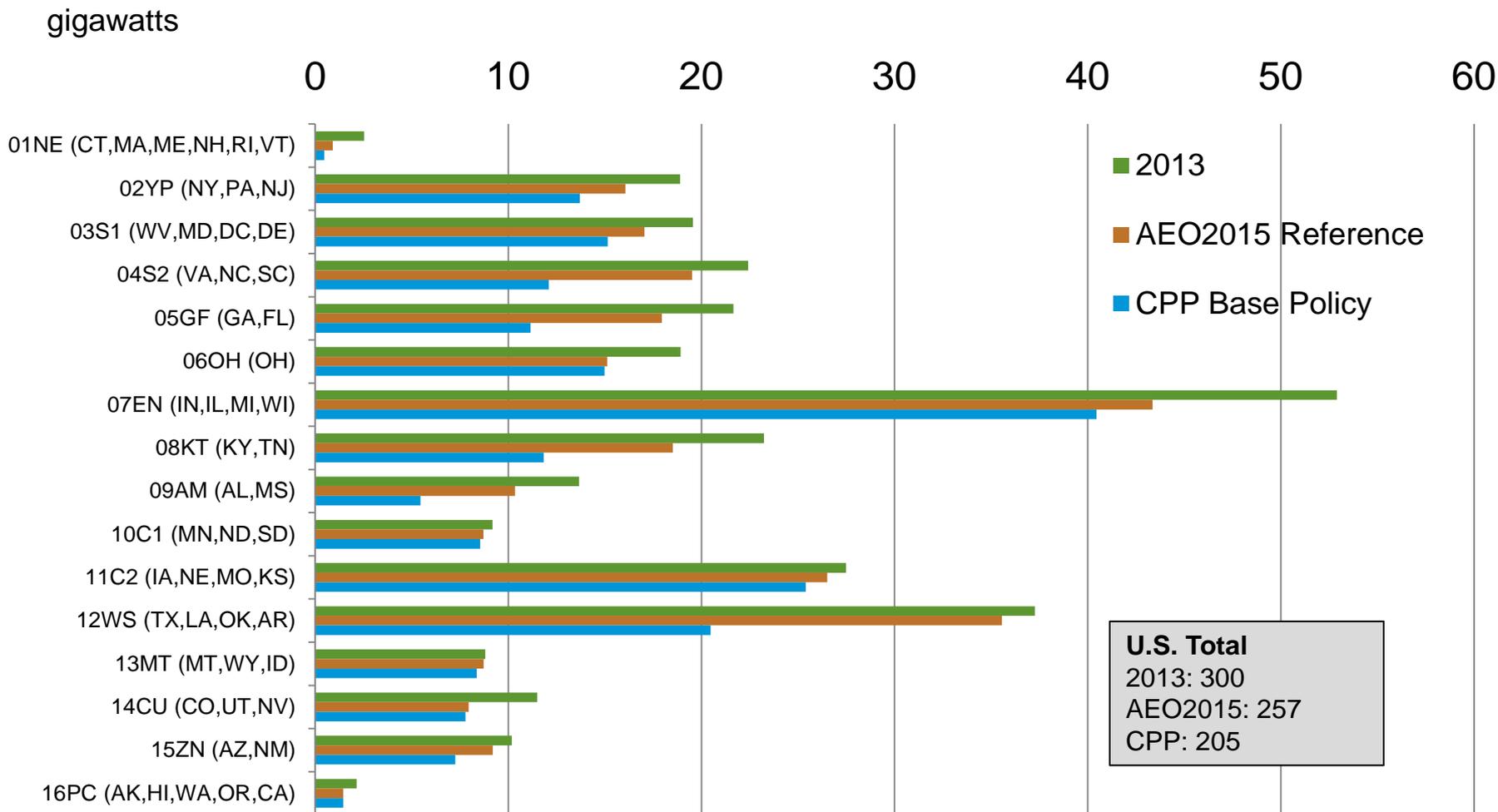
Coal demand regions



Region Code	Region Content
1. NE	CT,MA,ME,NH,RI,VT
2. YP	NY,PA,NJ
3. S1	WV,MD,DC,DE
4. S2	VA,NC,SC
5. GF	GA,FL
6. OH	OH
7. EN	IN,IL,MI,WI
8. KT	KY,TN
9. AM	AL,MS
10. C1	MN,ND,SD
11. C2	IA,NE,MO,KS
12. WS	TX,LA,OK,AR
13. MT	MT,WY,ID
14. CU	CO,UT,NV
15. ZN	AZ,NM
16. PC	AK,HI,WA,OR,CA

Source: U.S. Energy Information Administration, Office of Energy Analysis

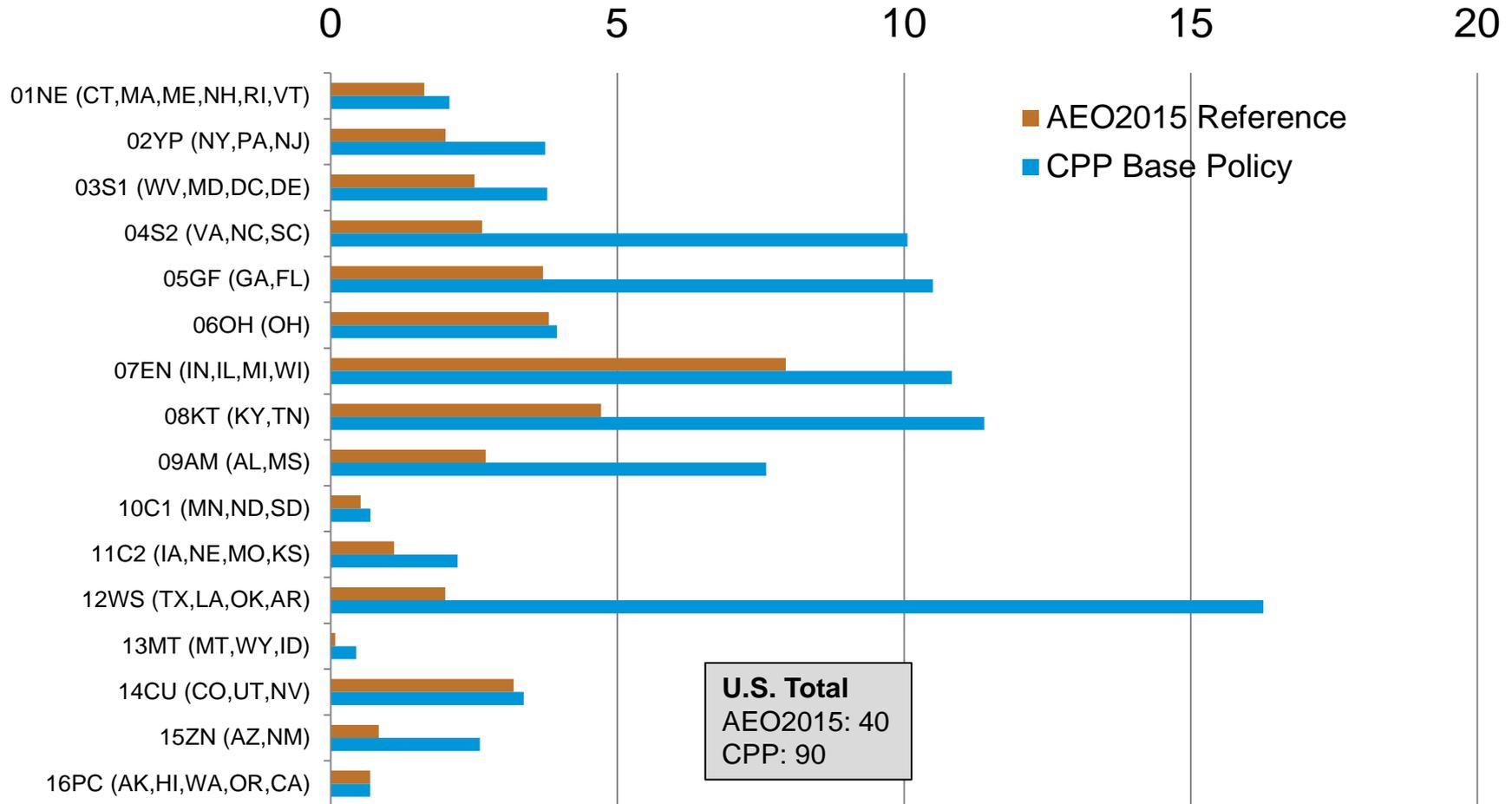
Net summer coal-fired generating capacity in the electric power sector by coal demand region, 2013 and 2040



Source: AEO2015 Reference Case (NEMS run ref2015.d021915a); and CPP Base Policy Case (NEMS run rf15_111_d030615a)

Cumulative net summer coal-fired capacity retirements by coal demand region, 2014-2040

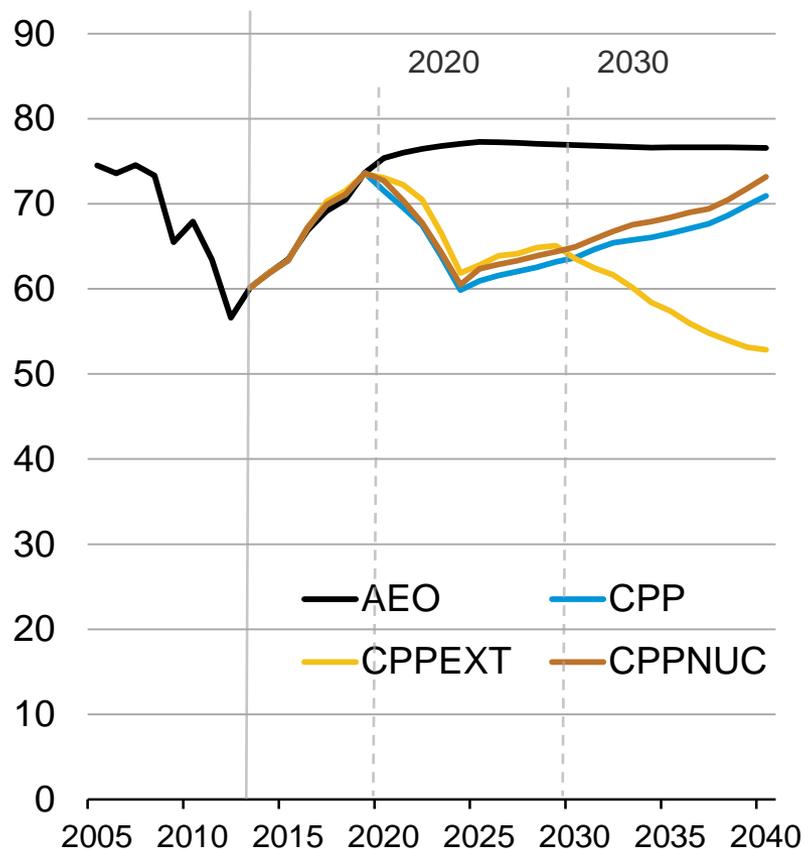
gigawatts



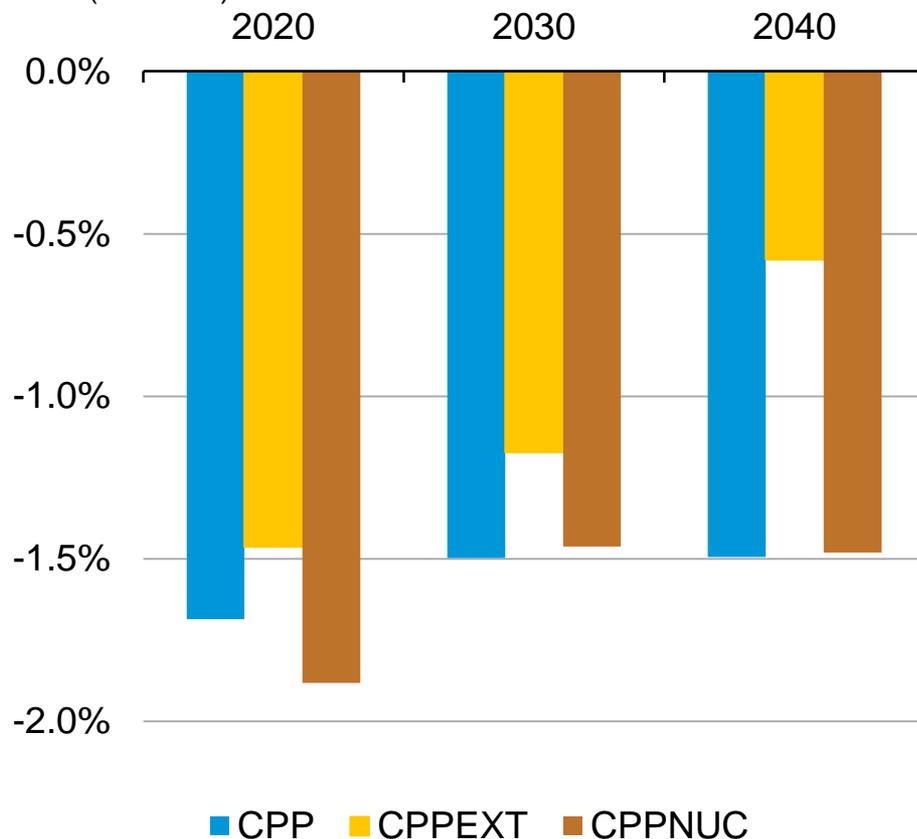
Source: AEO2015 Reference Case (NEMS run ref2015.d021915a); and CPP Base Policy Case (NEMS run rf15_111_d030615a)

The proposed Clean Power Plan reduces average capacity factors and reduces heat rates for coal-fired generating units

capacity factor (percent)



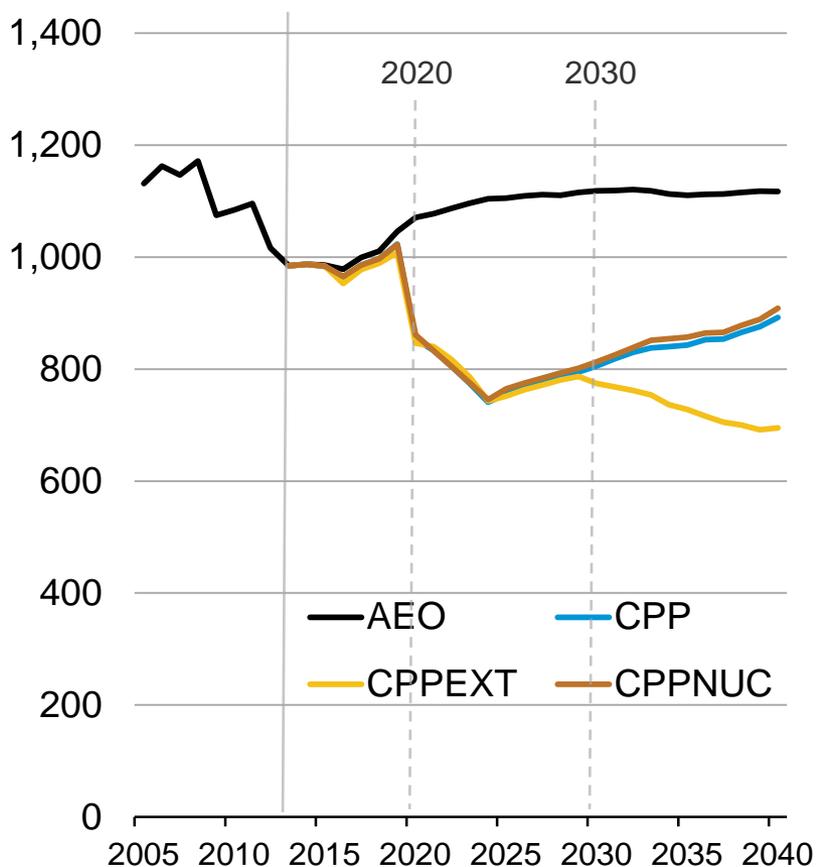
percent change in average coal plant heat rate (Btu/kWh) relative to AEO2105 Ref. case



Source: EIA, Annual Energy Outlook 2015 and Analysis of Impacts of the Clean Power Plan, May 2015

Coal production levels for the Base Policy case (CPP) are substantially below baseline – 20% lower in 2020 and 32% lower in 2025

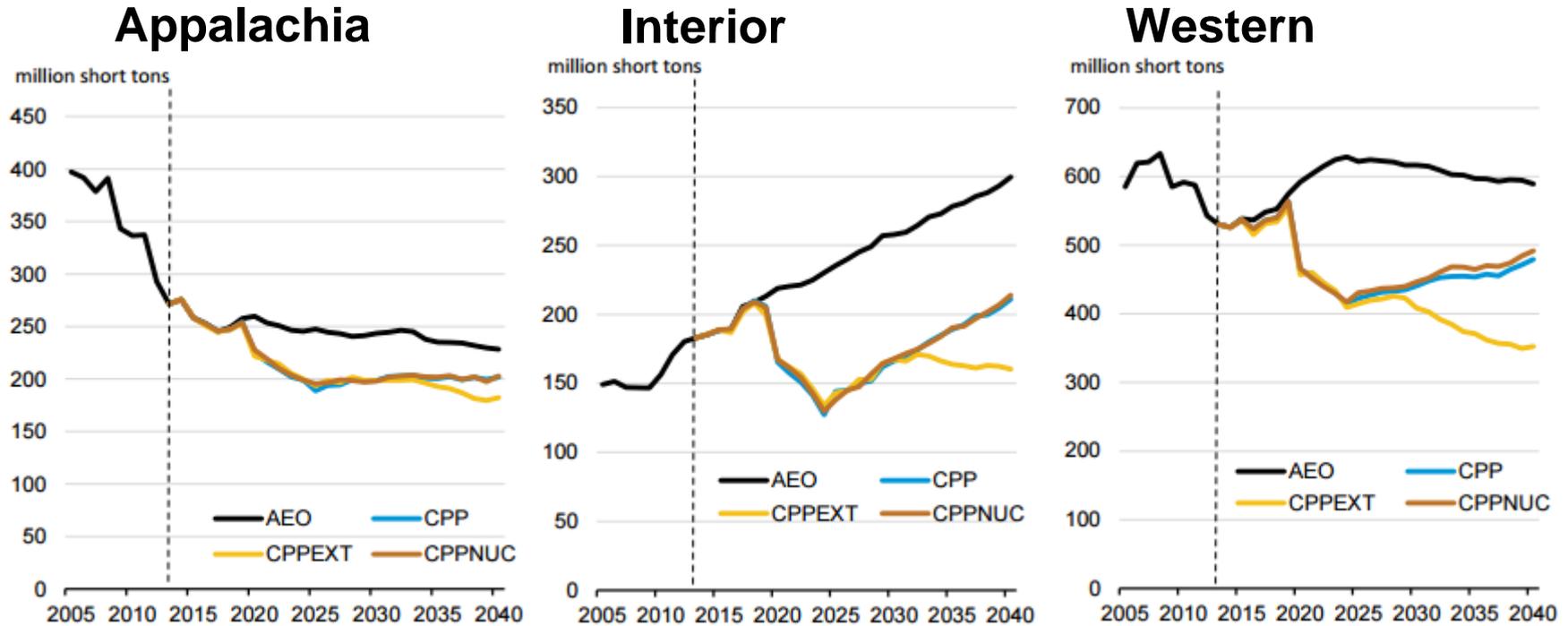
million short tons



- Coal production in the Base Policy case increases by 151 million tons after 2024 as utilization of remaining coal units improves due to increasing electricity demand, expanded use of renewables, rising natural gas prices, and static CPP targets in the post-2030 period

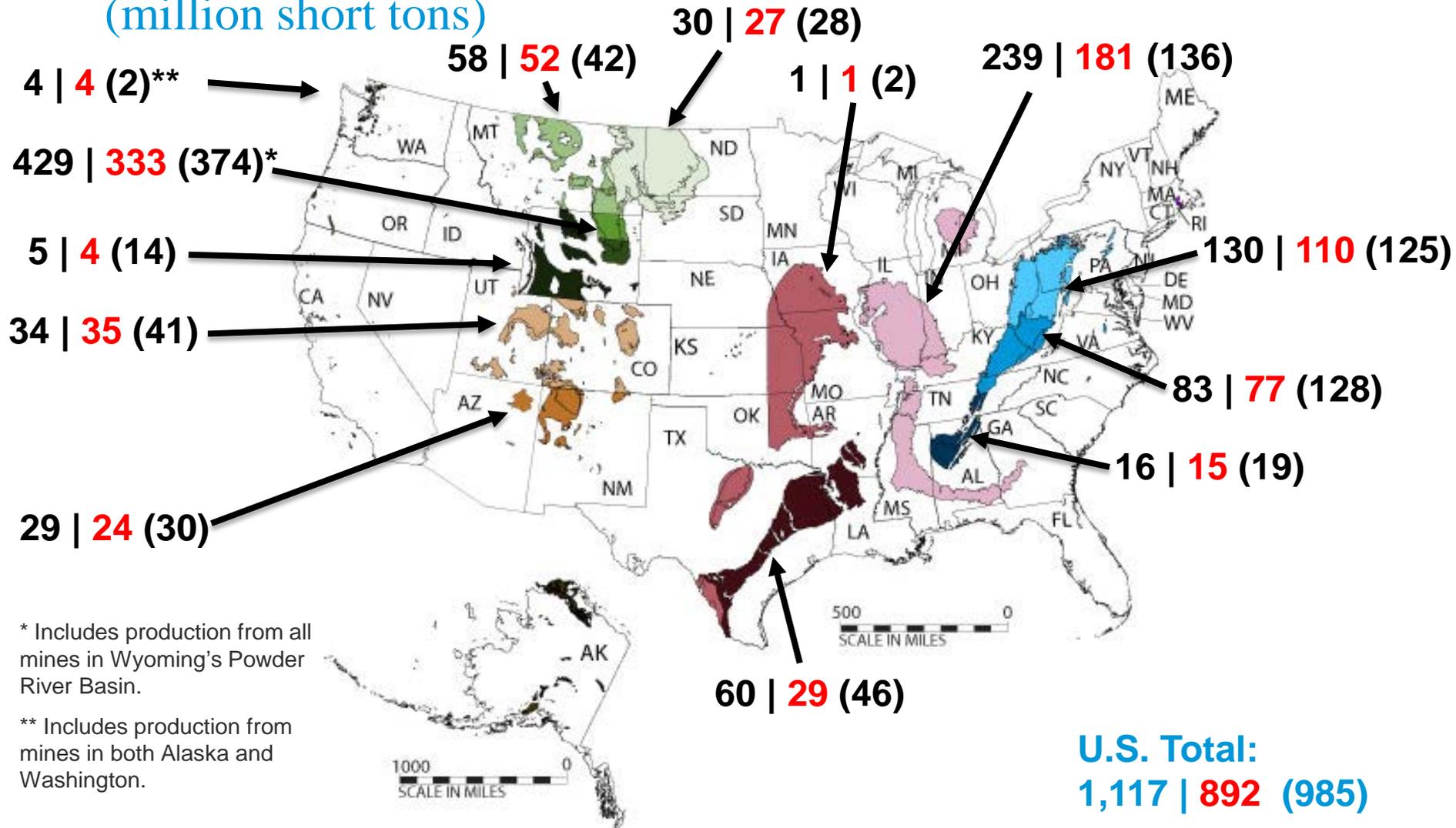
Source: EIA, Annual Energy Outlook 2015 and Analysis of Impacts of the Clean Power Plan, May 2015

Regional coal production impacts vary across regions and scenario



Source: EIA, Annual Energy Outlook 2015 and Analysis of Impacts of the Clean Power Plan, May 2015

Coal production, AEO2015 and Draft CPP in 2040 (vs. 2013) (million short tons)



* Includes production from all mines in Wyoming's Powder River Basin.

** Includes production from mines in both Alaska and Washington.

1000
SCALE IN MILES

500
SCALE IN MILES

U.S. Total:
1,117 | 892 (985)

Source: 2013: Mine Safety and Health Administration, Form 7000-2, "Quarterly Mine and Employment and Coal Production Report;" 2040: AEO2015 Reference Case (NEMS run ref2015.d021915a); and CPP Base Policy Case (NEMS run rf15_111_d030615a).

Final rule delays start, improves phase-in, changes coverage, and increases flexibility

Proposed Rule	Final Rule
Compliance begins in 2020 with one interim period from 2020 – 2029; Final targets in 2030	Compliance start delayed to 2022 with three interim periods (2022–2024, 2025-2027, 2028-2029); Final targets in 2030
Four building blocks (heat rate improvement, switching to NG, zero-carbon technologies, EE)	Three building blocks (heat rate improvement, switching to NG, zero-carbon technologies); EE counts for compliance but is not included in target calculation
Existing nonhydro renewables and incremental (new) renewables are included; end-use renewables excluded	Existing renewables excluded; incremental (post-2012) additions only; end-use renewables (incremental) included
Existing “at-risk” and incremental (post-2012) nuclear included	Existing (“at-risk”) nuclear excluded; incremental (post-2012) additions only
Fossil emission rates based on each State’s existing capacity resulting in considerable variation	Source specific (fossil steam, NGCC) rates determined at interconnect level reducing variation
Existing fossil steam, NGCC, and “large” or “higher-utilization” combustion turbines included	Existing fossil steam, NGCC; all combustion turbines excluded
Mass-based targets described but not specified	Two mass-based targets specified for fossil (existing, all)
Credit trading described but not sufficiently specified	Credit trading options more fully defined

Phase-in of CPP requirements

- Implementation start shifts to 2022 from 2020, but still reaches mandated final targets in 2030
- Interim period is split into three steps (2022-2024, 2025-2027, and 2028-2029) with separate performance rates
 - Earlier targets are less stringent than in proposal – imposing a ‘glide path’ that will lessen the near-term cliff seen originally
 - Final rule includes a new early incentive program to certain renewable and EE projects that provide/reduce generation in 2020 and 2021
- State plans due September 2016, grace period until September 2018

Final Clean Power Plan rule revises calculation of targets and building blocks

- Final rule sets source-specific CO₂ emission rates – one for fossil-fired steam plants and one for natural gas combined cycle units – that are the same nation-wide, and initially calculated based on the three major interconnects
- State rate goals and mass goals are also calculated using the source-specific rates and the state mix of generation types
- Target rates were based on three building blocks – eliminating EE from the four blocks used for the proposal
 - Coal heat rate improvement of 2.1%-4.3% (less than 6% used originally)
 - Increased dispatch of NGCC based on 75% capacity factor
 - New renewable potential assumed in target calculation is higher than original; existing renewables, existing (“at-risk”) and under construction nuclear excluded

Increased emphasis on trading as flexibility mechanism: proposed federal plan/model rules

- Role of EPA model rules: both rate and mass-based programs can implement trading without formal interstate agreements
 - EPA's proposed model rules/federal plan to be finalized Summer 2016
- Rate-based plans: emission rate credits (ERCs)– represent MWh of zero-emitting generation or avoided generation through EE – can be traded, and used as MWh in the denominator of the rate calculation for state holding the ERC
- Mass-based plans: allowances representing carbon emissions are traded directly, as long as each state holds enough allowances to meet its own emission cap.

Sources used for compliance are revised

- Emissions from existing (online by Jan. 8, 2014) fossil steam and gas combined cycle plants are included
 - Greater than 25 MW
 - Simple cycle combustion turbines excluded, regardless of output
- Compliance with a state rate-based target can include new, non-emitting sources or EE
 - New nuclear or renewable generation online after 2012 (not all existing), including uprates
 - End-use renewable generation can be counted
 - Energy efficiency can be counted (beyond 'baseline' amounts)

EIA Data Browsers and Energy Mapping System

Electricity Data Browser - <http://www.eia.gov/electricity/data/browser/>

Coal Data Browser (Beta) - <http://www.eia.gov/beta/coal/data/browser/>

Nuclear Outage Browser (Beta) - <http://www.eia.gov/beta/outages/>

Energy Mapping System - <http://www.eia.gov/state/maps.cfm>

Short-Term Energy Outlook - <http://www.eia.gov/forecasts/steo/query/>

Annual Energy Outlook - <http://www.eia.gov/oiaf/aeo/tablebrowser/>

International Energy Outlook - <http://www.eia.gov/oiaf/aeo/tablebrowser/>

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Short-Term Energy Outlook | www.eia.gov/steo

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