

Phasing Out Coal Generation in Colorado

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Clean Air Act (CAA) Requirements

- Colorado and other states late in submitting to the Federal Environmental Protection Agency (EPA) a plan for reducing emissions that contribute to **regional haze**
 - State Implementation Plan (SIP)
 - Primary focus on NOx emissions
 - Coal plants in Colorado do not have adequate NOx controls
- The Denver/Metro area struggles to keep ozone levels within the standards set by the EPA
 - New stricter ozone standards likely to be approved
 - An SIP for ozone likely to seek further NOx emission reductions
- Other pollutants and pollutants being addressed by EPA
- Carbon dioxide emissions also addressed under CAA



Legislative Response

- Various interests converged at the Colorado General Assembly to address emerging emission reduction requirements
 - Utilities with coal plants facing stricter EPA regulations
 - Plants generally aging facilities nearing the end of their useful lives
 - Natural gas producers eager to sell their product in a low market price environment
 - State legislators and air quality regulators seeking to meet EPA requirements and prevent federal action
 - Environmental groups, doctors, and public health officials seeking cleaner air
 - City and county governments concerned about local economic impacts
 - Unhappy neighbors of the plants



House Bill 10-1365

- Clean Air – Clean Jobs Act
 - Signed into law on April 9, 2010
- Public Service required to submit an emission reduction plan by August 15, 2010
 - At least 900 MW of coal-fired generation
 - Three options for each plant : emission controls, retirement/replacement, and conversion from coal to natural gas
 - All actions implemented by December 31, 2017
 - Plan must be reviewed by Department of Public Health and Environment (CDPHE) and approved by the Air Quality Control Commission (AQCC)
 - o Incorporation into SIP for regional haze
 - o Plan must meet “reasonably foreseeable” requirements of the CAA
- Commission must issue decision by December 15, 2010



House Bill 10-1365 (continued)

- Commission obligated to consider nine factors:
 - 1) 70-80% reduction in NOx emissions
 - 2) CDPHE determination of emissions from replacement capacity
 - 3) Reductions in other emissions
 - 4) Use of existing natural gas-fired facilities
 - 5) Ability of Public Service to meet state and federal clean energy requirements (Renewable Energy Standard) and reliance on energy efficiency or other low-emitting resources
 - 6) Promotion of Colorado economic development
 - 7) Reliable electric service
 - 8) Protection from future cost increases associated with reasonably foreseeable emission reduction requirements
 - 9) Costs of plan result in reasonable rate impacts



Public Service's Plan

- Public Service initially submitted nine scenarios on August 13, 2010
 - Various combinations of coal plant retirements/replacements, emission controls, and/or fuel conversions to natural gas
 - One scenario a preferred plan (Scenario 6.2E)
 - Most other plans suggested by stakeholders or required by statute
- Public Service's support for Scenario 6.2E challenged by parties and the Commission because it would not be fully implemented by December 31, 2017
- Public Service presented additional scenarios on October 25, 2010
 - Fuel switching an approach to make earlier scenarios compliant with 2017 deadline
 - Change in preferred scenario (Scenario 5B)
 - Another scenario a close second choice (Scenario 6.2J)



Coal Plants and Options

Coal Plant	Unit	MW	Year of Initial Operation	End of Useful Life ¹	Controls ⁴ Benchmark 1.0	End of Useful Life Post Controls	Notes
Cherokee	1	107	1957	2017	SNCR (2014) ⁶ RP Unit	2024	Coal contracts end in 2012 (Uintah) Coal transportation contracts end 2011
	2	106	1959	2019	SNCR (2014) ⁶ RP Unit	2024	Rail car lease expires 3/2016 (265 cars) Low NO _x burners on units 1,3, 4
	3	152	1962	2022	SCR (2017) ⁷ RP Unit	2032	
	4	352	1968	2028	SCR (2016) ⁷ BART Unit	2031	
Valmont	5	186	1964	2024	SCR (2015) ⁷ BART Unit	2030	Coal contracts end in 2012 (Uintah) Coal transportation contracts end 2011 Rail car lease expires 3/2016 (110 cars) Low NO _x burners on unit
Pawnee	1	505	1981	2041	SCR (2014) ⁷ BART Unit ⁵	2041	Coal contracts end in 2013 (PRB) Coal transportation contracts end 2020 Rail car lease expires 11/2016 (254 cars) Low NO _x burners on unit
Arapahoe	3	45	1951	2012	Retire (2014)	N/A	Coal contracts end in 2012 (PRB) Coal transportation contracts end 2013 Rail car lease expires 6/2015 (130 cars)
	4	111	1955	2012	Retire (2014)	N/A	Low NO _x burners on unit 4
Hayden ²	1	139	1965	2025	SCR (2015) ⁷ BART Unit	2030	Coal contracts end in 2011 (Uintah) Coal transportation contracts end 2011
	2	98	1976	2036	SCR (2016) ⁷ BART Unit	2036	Low NO _x burners on both units

(1) From 2009 Depreciation Study (Docket No. 09AL-299E)

(2) Includes only Public Service's share (75.5% of unit 1 and 37.4% of unit 2)

(4) Regional Haze SIP: RP Unit = "Reasonable Progress"; BART = "Best Available Retrofit Technology"

(5) BART for both Regional Haze and future Ozone SIP; spray dry absorption system for flue gas desulfurization required for SO₂ reductions to meet regional haze SIP

(6) SCR not feasible (air heater design and available space); SNCR expected to achieve 30% NO_x reduction; retire after 10 years post SNCR installation

(7) Plant life extended 15 years after installation of SCR:



Scenario 5B

	2011	2012	2013	2014	2015	2016	2017
Existing Coal Plant							
Cherokee 1	Retire						
Cherokee 2	Retire	SC					
Cherokee 3							Retire
Cherokee 4						SCR	
Arapahoe 3			Retire	SC			
Arapahoe 4				Gas			
Valmont 5							Retire
Hayden 1					SCR		
Hayden 2						SCR	
Pawnee				SCR/LSD			
Replacement							
2 X 1 Cherokee					On-Line		
1 X 1 Cherokee							
Peaker Cherokee							
IPP Re-ups							

NO_x (2018) -85%
CO₂ (2020) -24%

SC = Synchronous Condenser SCR = Selective Catalytic Reduction Control
Gas = Fuel Switch from Coal to Gas LSD = Lime Spray Dryer



Participating Stakeholders

- Traditional interests
 - Commission Staff
 - Office of Consumer Council
 - Governor's Energy Office
 - Customers
 - o Wal-Mart
 - o Climax Molybdenum Mine
 - o CF&I Steel
 - o Colorado Energy Consumers
- Coal mining interests
 - Peabody Energy
 - Colorado Mining Association
 - American Coalition for Clean Coal Electricity
- Environmental interests
 - Western Resource Advocates



- Natural Gas interests
 - Chesapeake Energy, Noble Energy, and EnCana
 - Anadarko
- Independent Power Producers
 - Colorado Independent Energy Association
 - Thermo Power
 - Southwest Generation
 - Interwest Energy Alliance
- Local Governments
 - Weld County
 - Northwest Colorado
 - Denver
 - Boulder
- Several Others



Procedural Challenges

- So many parties... so little time
 - Pre-filing activity: May 7, 2010 – August 12, 2010
 - Plan filing: August 13, 2010
 - Pre-filed testimony: 16 Company witnesses
50 + Intervenor witnesses
 - Public hearings: August 30, 2010
September 23, 2010
 - Evidentiary hearings: October 21 – November 3
November 18 - 20
 - Deliberations: December 6, 8 and 9, 2010
 - Decision No. C10-1328: December 15, 2010
- Filing deficiencies, confidential information, modeling limits
- Arguments regarding due process and Commissioner impartiality

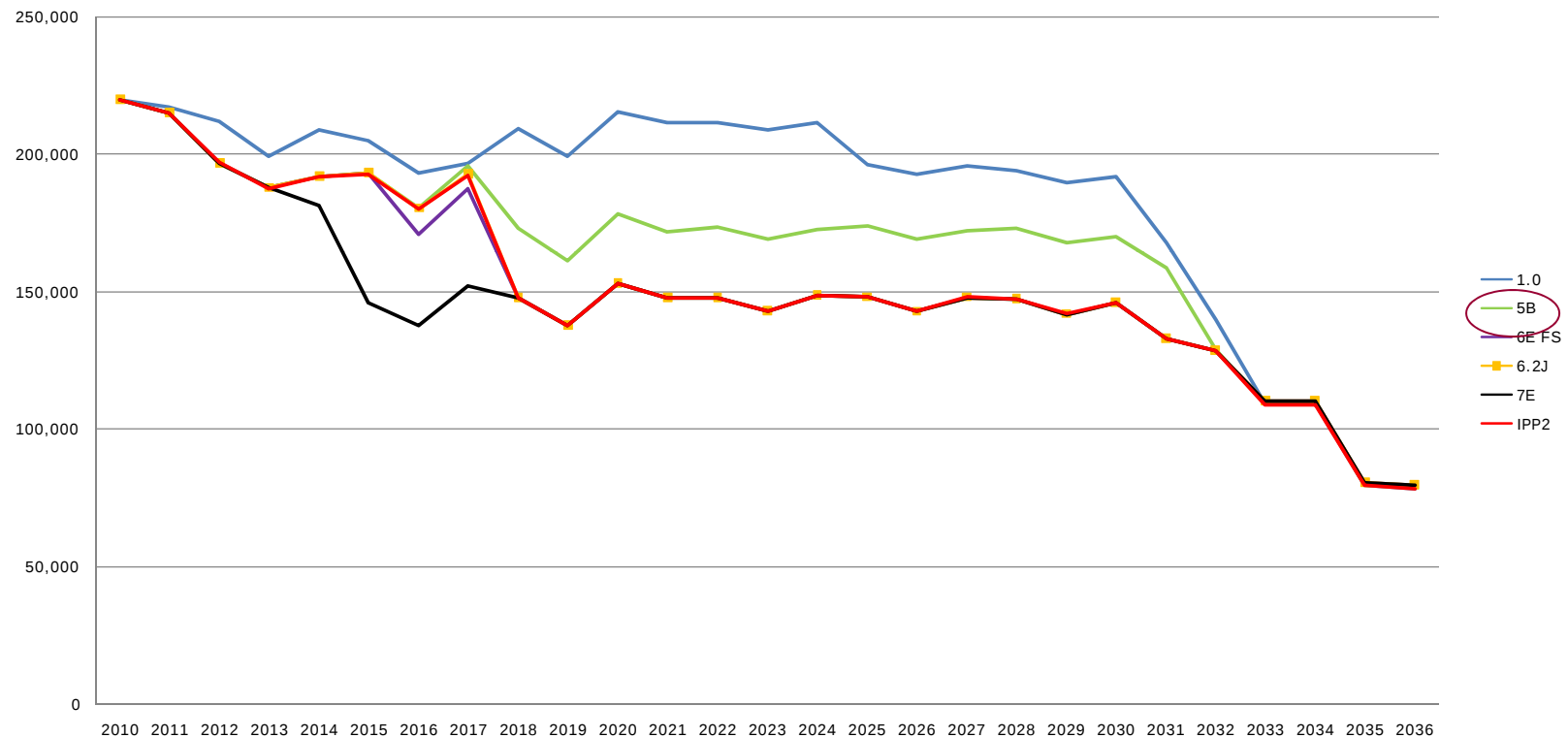


Issues

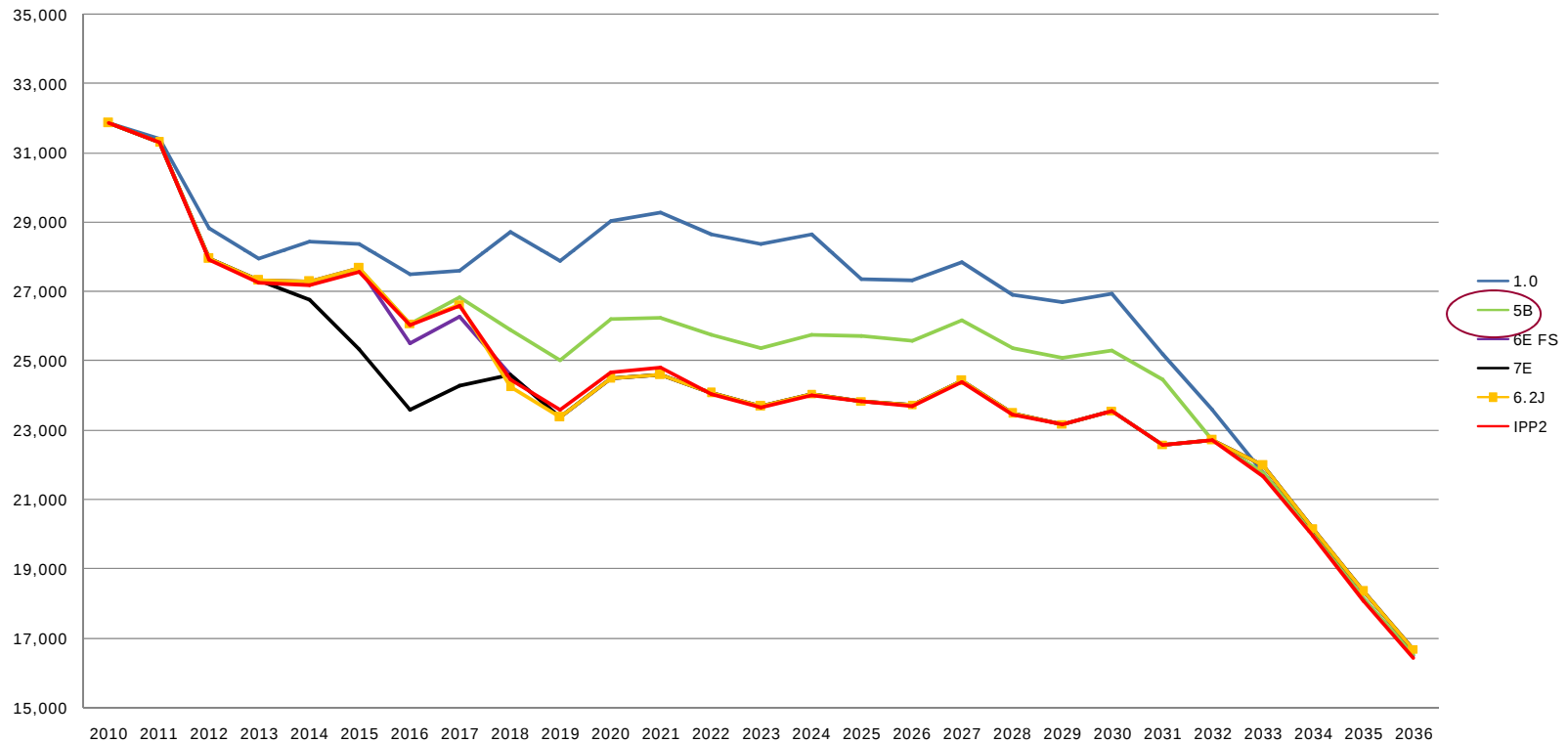
- Projected fuel costs
 - Coal
 - Natural gas
- Environmental regulation
 - Clean Air Act requirements
 - Carbon regulation
 - Gas production regulation
- System reliability
 - Generation located near load
- Health benefits
- Costs and rate impacts
- Economic impacts
 - Denver/Metro
 - Gas producing communities
 - Coal producing communities
- Competitive procurement and existing generation assets
- Access to information



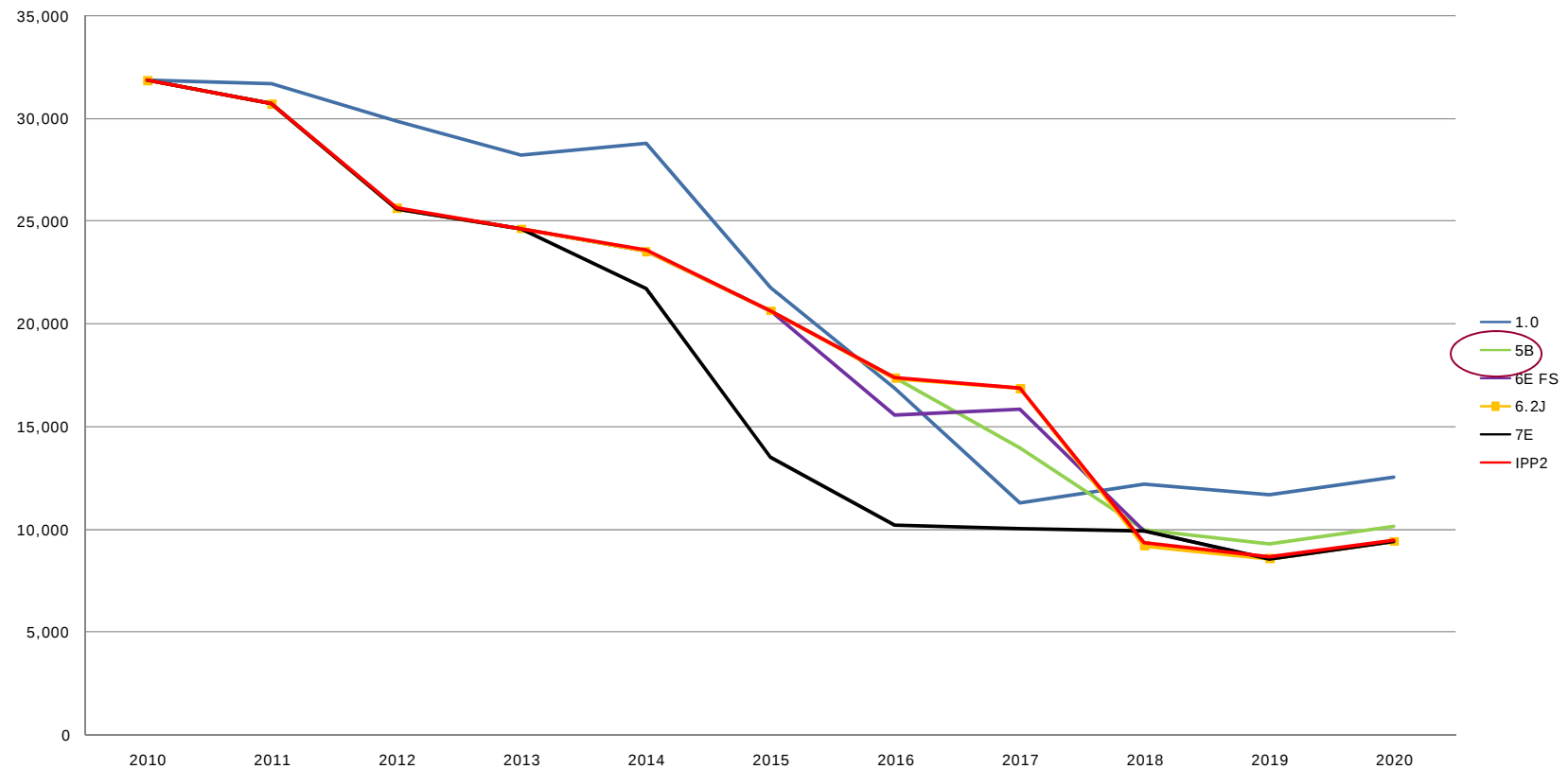
Reduction in Coal-Fired Generation



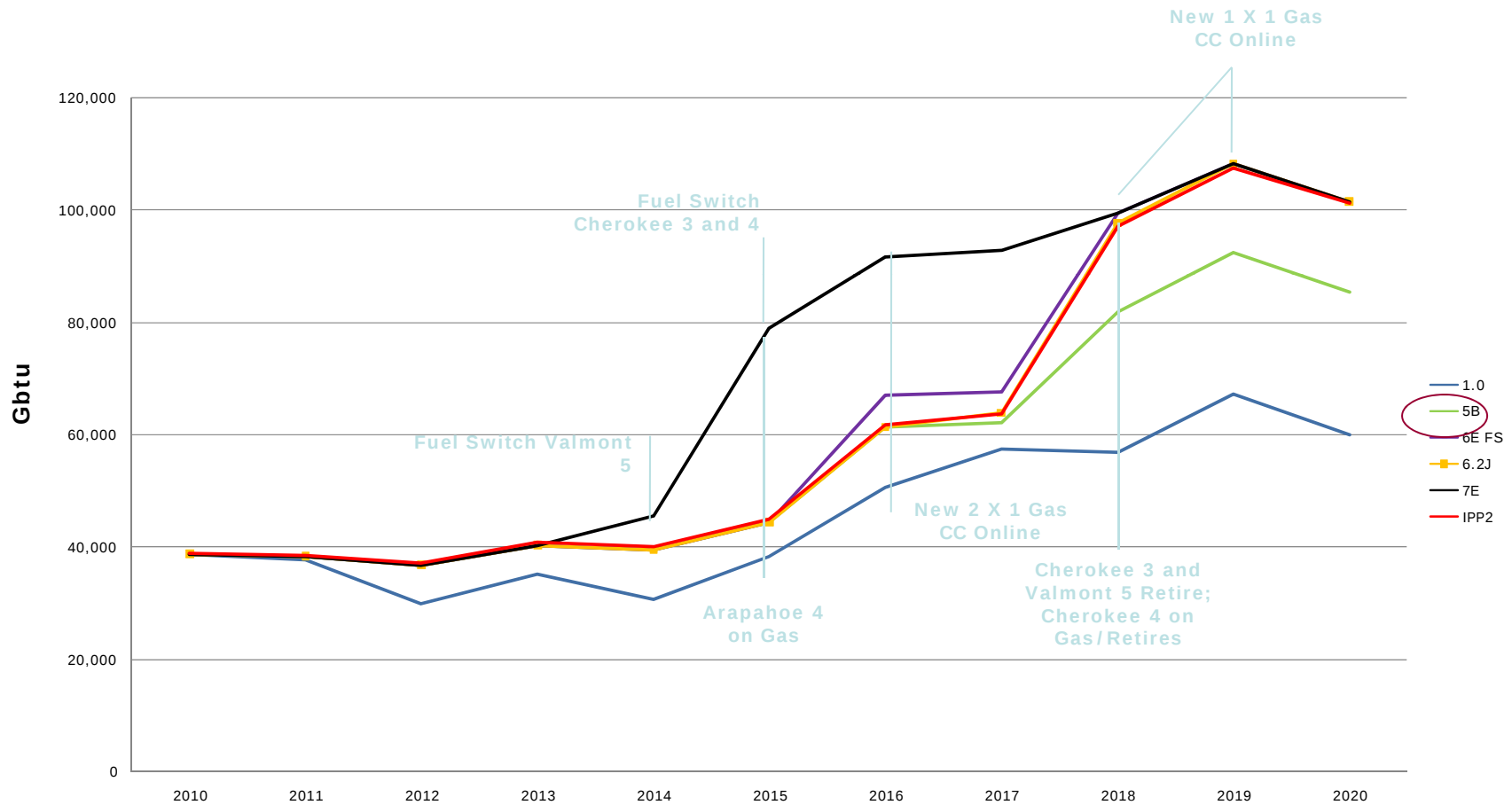
Reduction in Carbon Emissions



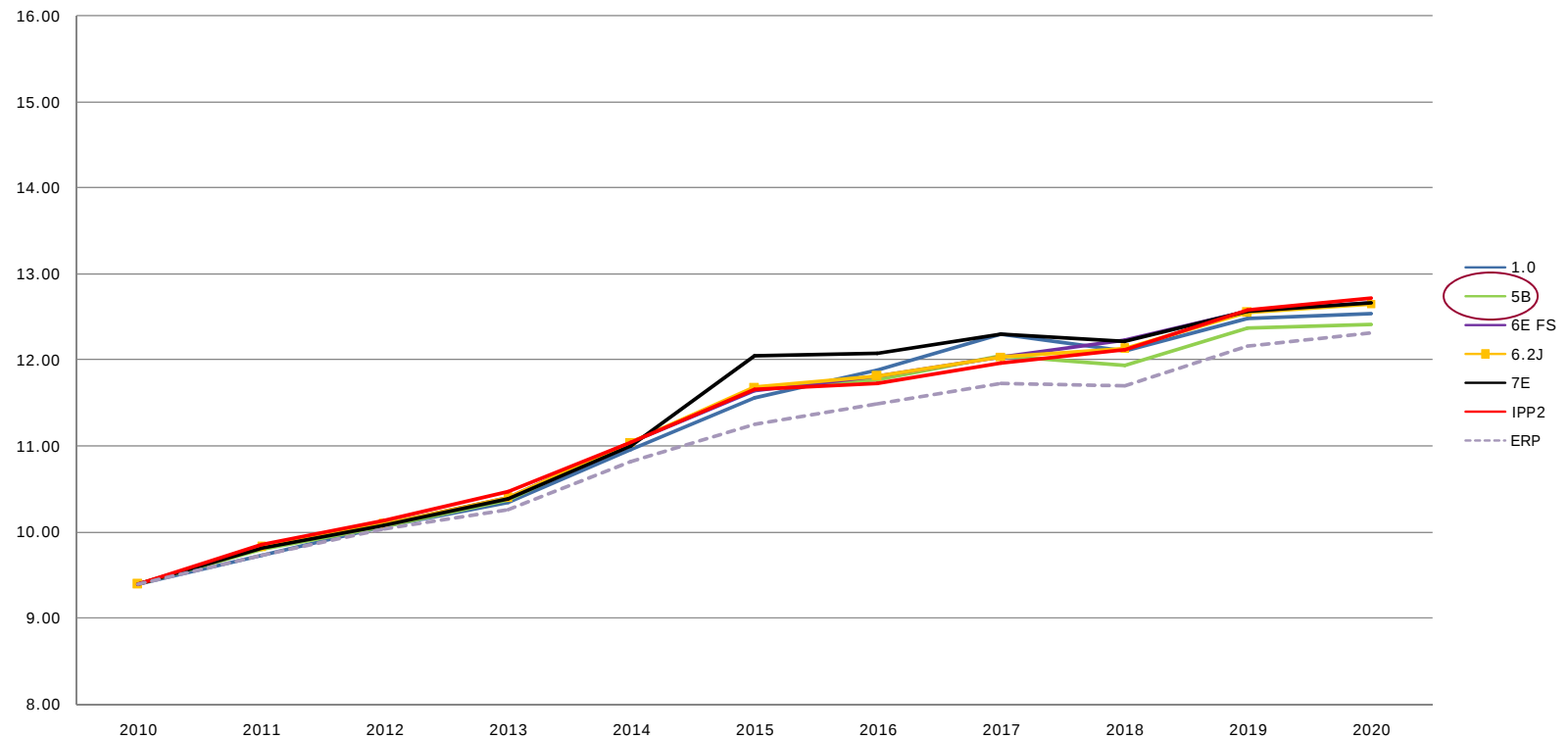
Reductions in NOx Emissions



Increase in Natural Gas Usage



Expected Impact on Rates



Decision No. C10-1328

- Commission modified Public Service's preferred plan (Scenario 5B) such that it most closely resembles Scenario 6E FS
 - Retirement of Arapahoe 3, Cherokee 1, 2, and 3 and Valmont 5
 - Fuel switching at Arapahoe 4 and Cherokee 4
 - Controls at Pawnee and Hayden
- Public Service's proposed rate rider rejected
 - Future filings required to recover costs associated with the plan
 - Deferred accounting allowed for accelerated depreciation and removal expenses



Next Steps

- AQCC adopted regional haze SIP that includes the Company's emissions reduction plan
 - Consideration by General Assembly
 - Consideration by EPA
- Applications for Rehearing, Reargument, or Reconsideration
 - Public Service: cost recovery and deadline flexibility
 - Coal interests: due processes and reduction in coal usage
- Applications for Certificates of Public Convenience and Necessity (CPCNs)
 - Plant retirements: decommissioning costs
 - Net plants: cost reviews
 - Emissions controls: cost reviews
- 2011 Electric Resource Plan due October 31, 2011

