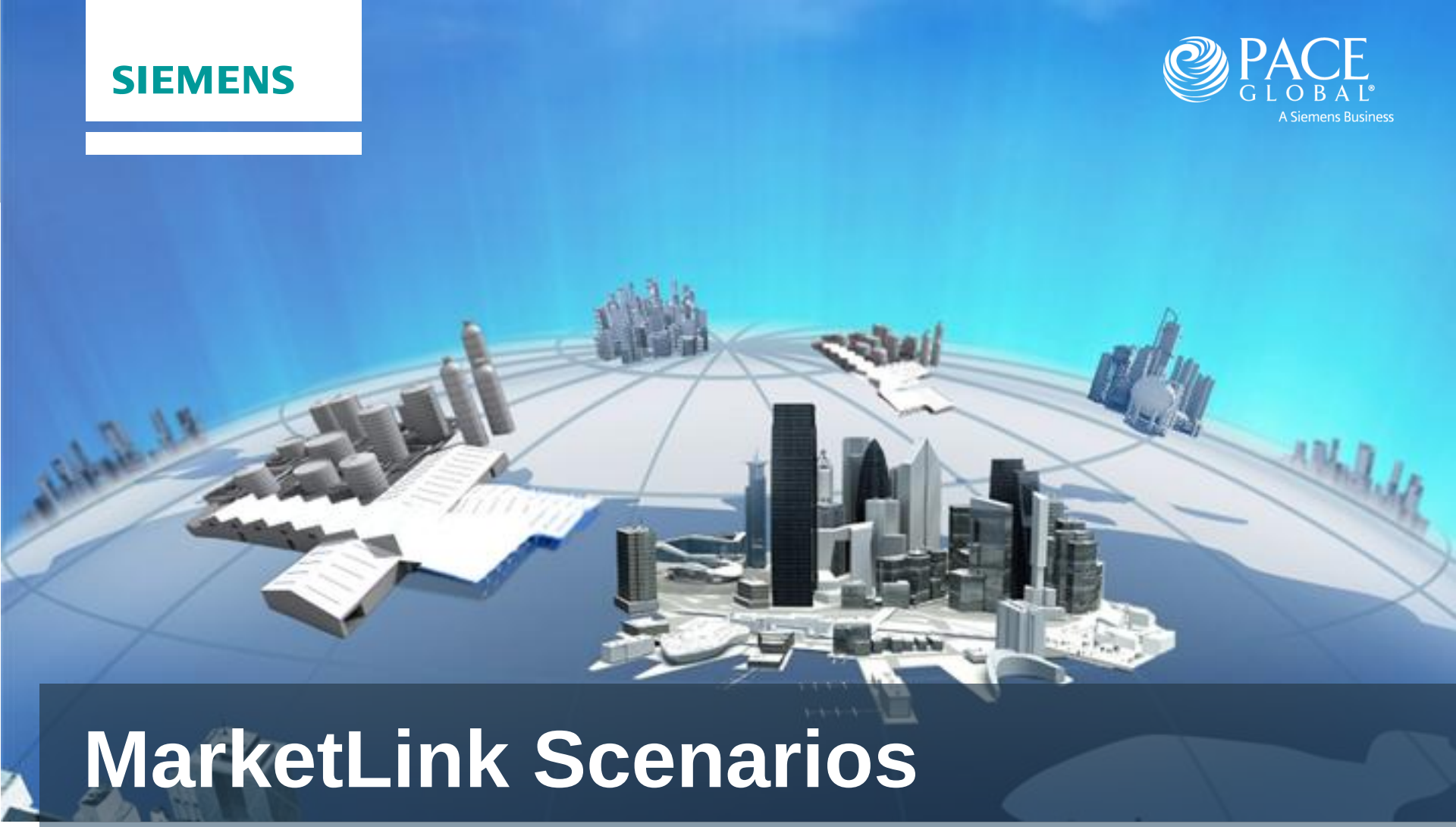
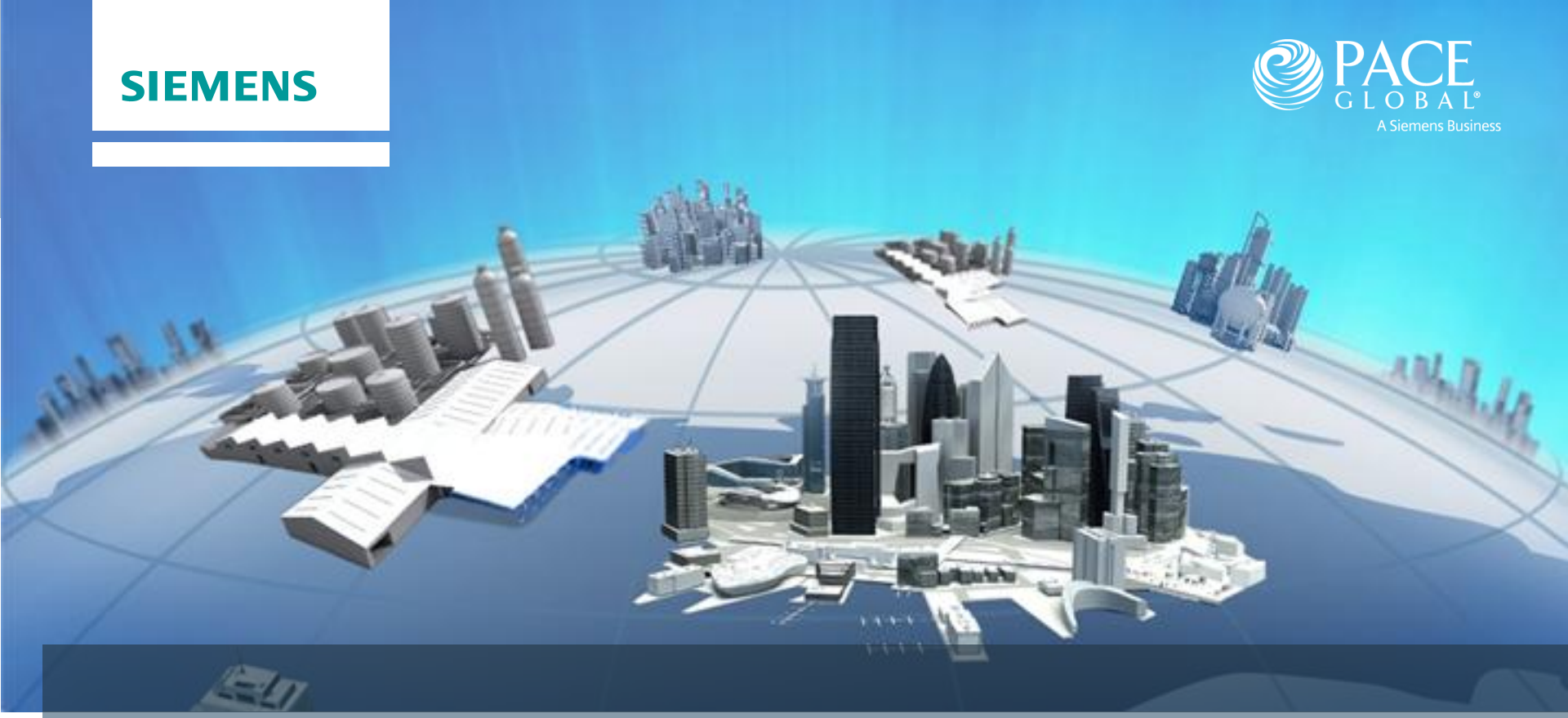


MarketLink Scenarios

Prepared for PNM

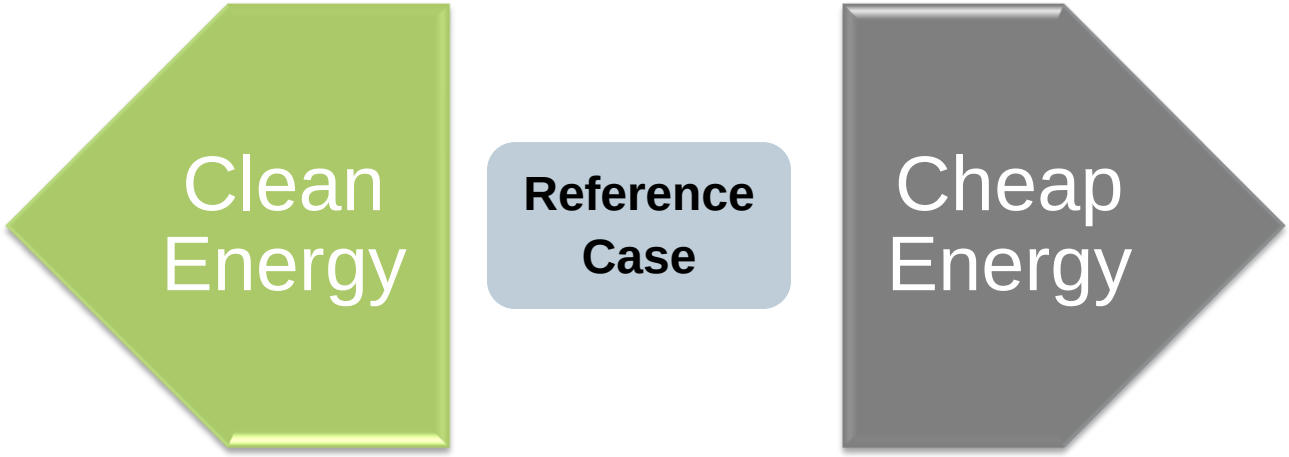
August 2013



Summary of Key Drivers and Outcomes

MarketLink Scenarios: Alternative Energy Market Futures

- Pace Global's MarketLink scenarios are a set of internally-consistent states of the world developed against a backdrop of changing policy frameworks over time



Strong environmental policy results in high CO_2 price, many coal retirements, and significant renewable expansion; power sector demand and fracking ban results in high gas prices

Focus on low cost energy; weak environmental regulation; few coal retirements; few renewables

Reference Case

Conditions	Short Term 2013-2015	Mid Term 2016-2025	Long Term 2026-2035
Environmental Regulations	➢MATS remains on track for 2016 implementation	➢Possibility of additional regulations, e.g. revised CSAPR	➢Gradual tightening of emissions restrictions
Natural Gas Prices (HH and Permian)	➢NYMEX Forwards to 2015	➢Gas prices move towards range of $5-6/MMBtu	➢Gas price increases towards a range of $6-7/MMBtu
Gas Market Factors	➢Modest growth in Permian gas production, declining San Juan production	➢Growth, then plateau, of Gulf Coast LNG and Mexican pipeline exports	➢Production costs edge up as associated gas development declines
CO2 Prices	➢No CO2 regime	➢Modest CO2 regime starts in 2020 ($10/tonne)	➢CO2 prices above $30/tonne in the 2030s
PRB Coal Price	➢PRB 8800|0.80 in the range of $12-14/ton plus transport	➢ PRB 8800|0.80 in the range of $15/ton plus transport	➢PRB 8800|0.80 in the range of $13-14/ton plus transport
National Coal Retirements	➢Announced (up to 25 GW)	➢10-15 GW (up to 40 GW cumulative)	➢30-50 GW (up to 90 GW cumulative)
Regional Power Sector Load Growth	➢Base load growth (1.5%)	➢Base load growth (1%), increased efficiency saps growth	➢Base load growth (0.5%), demand side management and efficiency stall most load growth
Power Sector Expansion	➢Continued replacement of coal fired generation with gas. Moderate expansion of solar and wind	➢Renewable penetration increases with 15-20% of load outside of SERC and RFC being met by renewables	➢Coal replacement with gas and continued build out of wind and solar throughout the country.

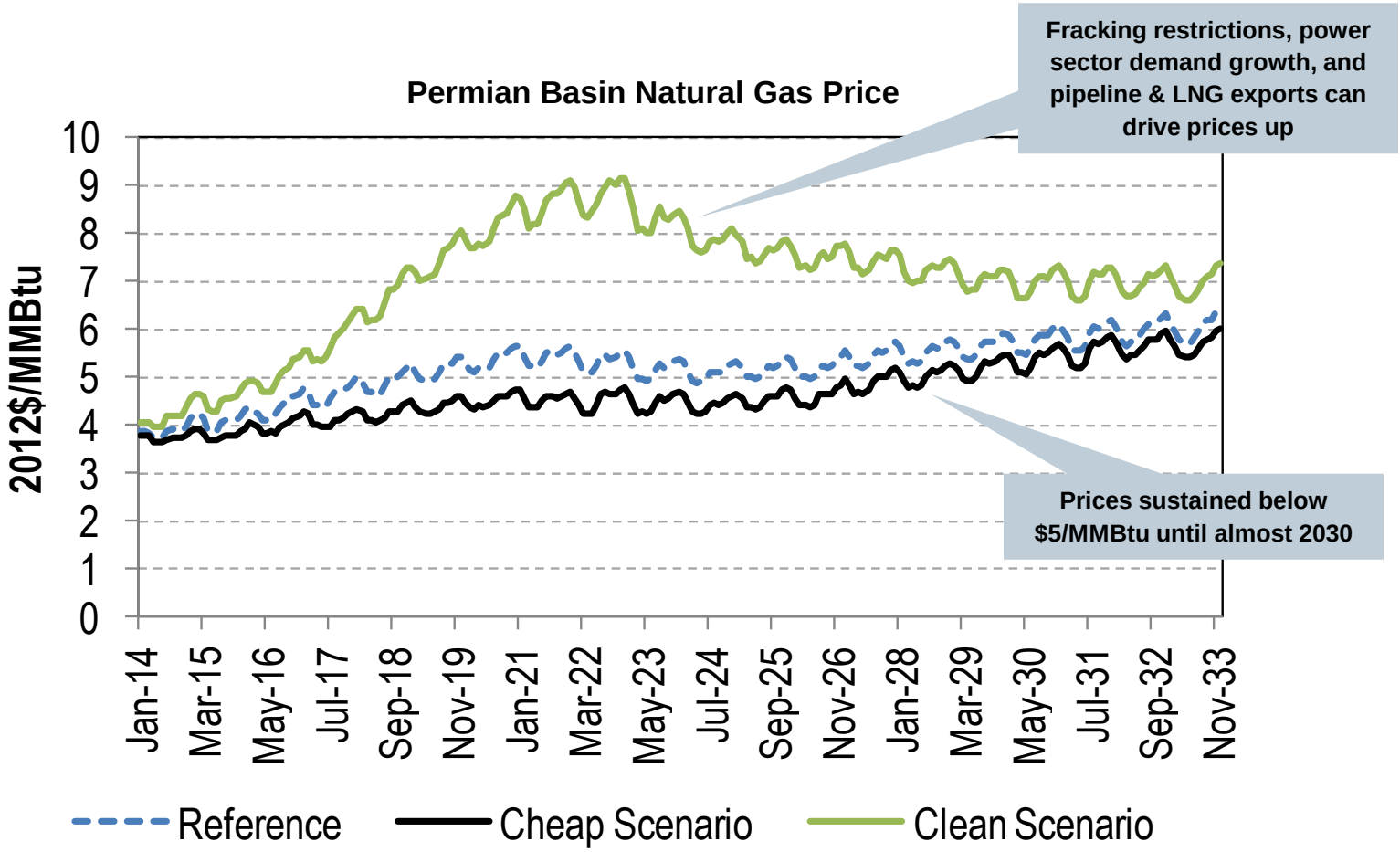
Cheap Scenario

Conditions	Short Term 2013-2015	Mid Term 2016-2025	Long Term 2026-2035
Environmental Regulations	➢ Potential delays/extensions for MATS compliance	➢No new environmental regulations	➢Limited environmental regulations
Natural Gas Prices (HH and Permian)	➢ Gas prices remain <$4/MMBtu	➢ ~$4-5/MMBtu as LNG exports begin	➢ Gas price gradually increases to $6/MMBtu
Gas Market Factors	➢Rapid decline in San Juan Basin production; accelerated growth in pipeline exports	➢Sustained growth of Gulf Coast LNG exports; robust associated gas development	➢Production costs edge up as associated gas development declines
CO2 Prices	➢ No CO2 regime	➢ No CO2 regime	➢ CO2 price introduced ($10/tonne)
PRB Coal Price	➢PRB 8800|0.80 in the range of $11-13/ton plus transport	➢ PRB 8800|0.80 in the range of $14-18/ton plus transport	➢PRB 8800|0.80 >$20/ton a short ton plus elevated transportation costs, due to high demand
National Coal Retirements	➢Announced, with some reversals (up to 15 GW)	➢Limited coal retirements, <5GW (up to 20 GW cumulative). Mostly due to local and regional growth factors.	➢ Slight increase in coal retirements as concern for environment grows. 10-15GW (up to 35 MW cumulative) of older less efficient plants
Regional Power Sector Load Growth	➢Low load growth (0.05%)	➢Demand growth recovery (1.5%)	➢Demand growth recovery (2%)
Power Sector Expansion	➢Replacement of coal retirements with gas and renewables in advanced development	➢Gas build out to meet demand growth with moderate expansion of wind in Midwest and solar in Southwest	➢Limited renewable expansion; demand growth met through gas generation.

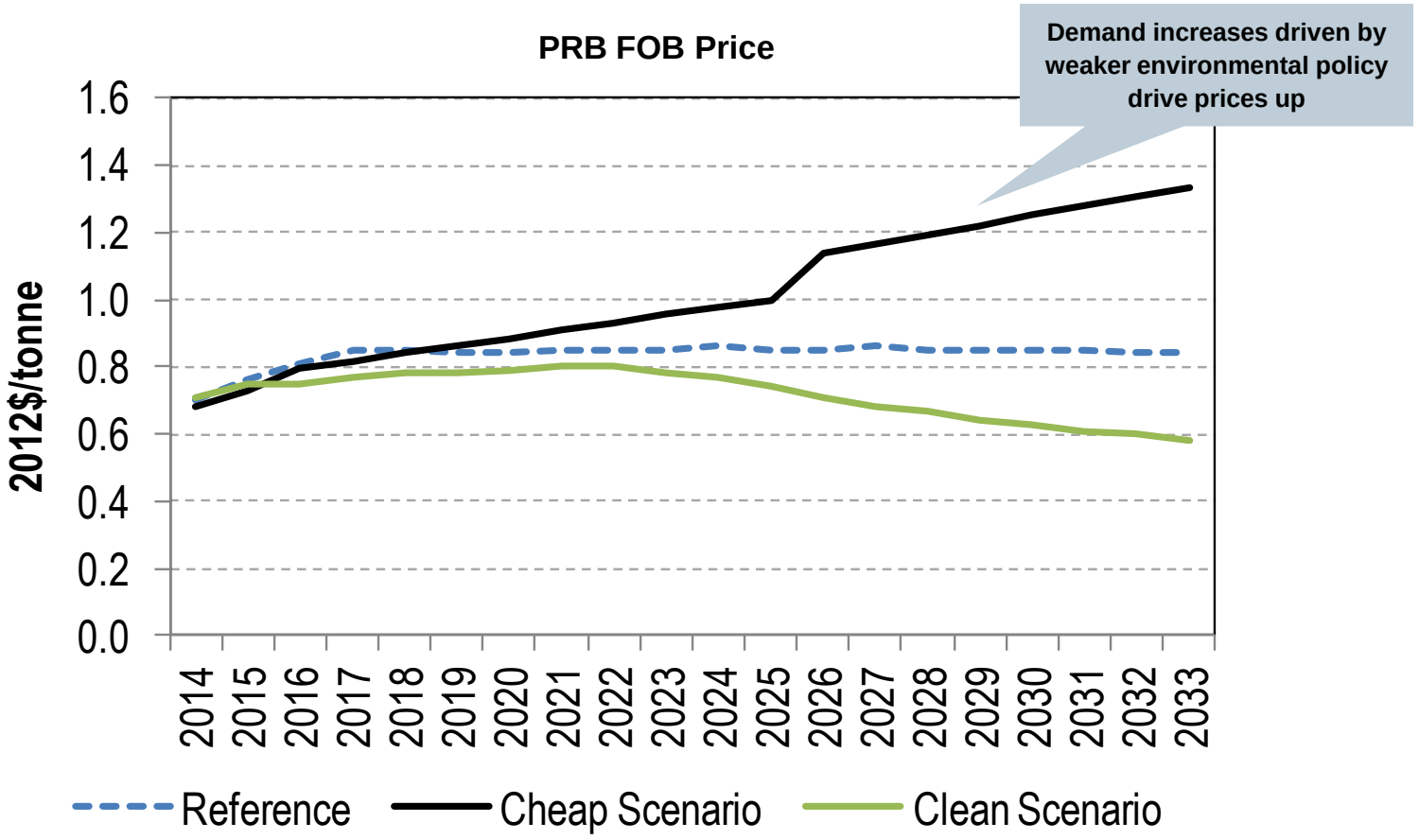
Clean Scenario

Conditions	Short Term 2013-2015	Mid Term 2016-2025	Long Term 2026-2035
Environmental Regulations	➢MATS remains on track for 2016 implementation	➢Continued new regulations: revised CSAPR, regional haze, ash disposal, Federal RPS	➢Regulations increasingly restrict ability of coal-fired plants to remain economical
Natural Gas Prices (HH and Permian)	➢Gas price rises to $5/MMBtu	➢ Power sector demand and fracking restrictions result in price runups to $10/MMBtu	➢ Some feedback to revert back to $7-8/MMBtu levels
Gas Market Factors	➢Supply/demand similar to reference case; many states move to ban or sharply restrict fracking	➢EPA institutes fracking restrictions; drilling declines by 50%; LNG export construction stops; LNG imports increase	➢EPA relaxes some drilling restrictions; rapid recovery of San Juan Basin CBM, other dry gas production
CO2 Prices	➢ Federal CO2 policy passed	➢ Federal carbon policy starts in 2018 (~$35/tonne by 2025)	➢ CO2 prices reach $55/tonne
PRB Coal Price	➢PRB 8800|0.80 in the range of $12-14/ton plus transport	➢ PRB 8800|0.80 in the range of $12-14/ton plus transport	➢PRB 8800|0.80 in the range of $10-12/ton plus softened transport costs
National Coal Retirements	➢Announced retirements	➢Stricter policy, including CO2, drives up to 140 GW of coal (cumulative) out by 2025	➢ Stricter policy, including CO2, drives up to 170 GW of coal (cumulative) out through 2035
Regional Power Sector Load Growth	➢ Load recovery (1.25%)	➢Efficiency/DSM penetration (0.5%)	➢Efficiency/DSM penetration (-0.5%)
Power Sector Expansion	➢Gas replaces retired coal with renewables significantly increasing share in West and Midwest	➢Federal RPS sets 15% floor with most states, outside of SERC and RFC, reaching >25%	➢Strict environmental regulations and storage advances drive cost of renewables below fossil generation driving >30% penetration

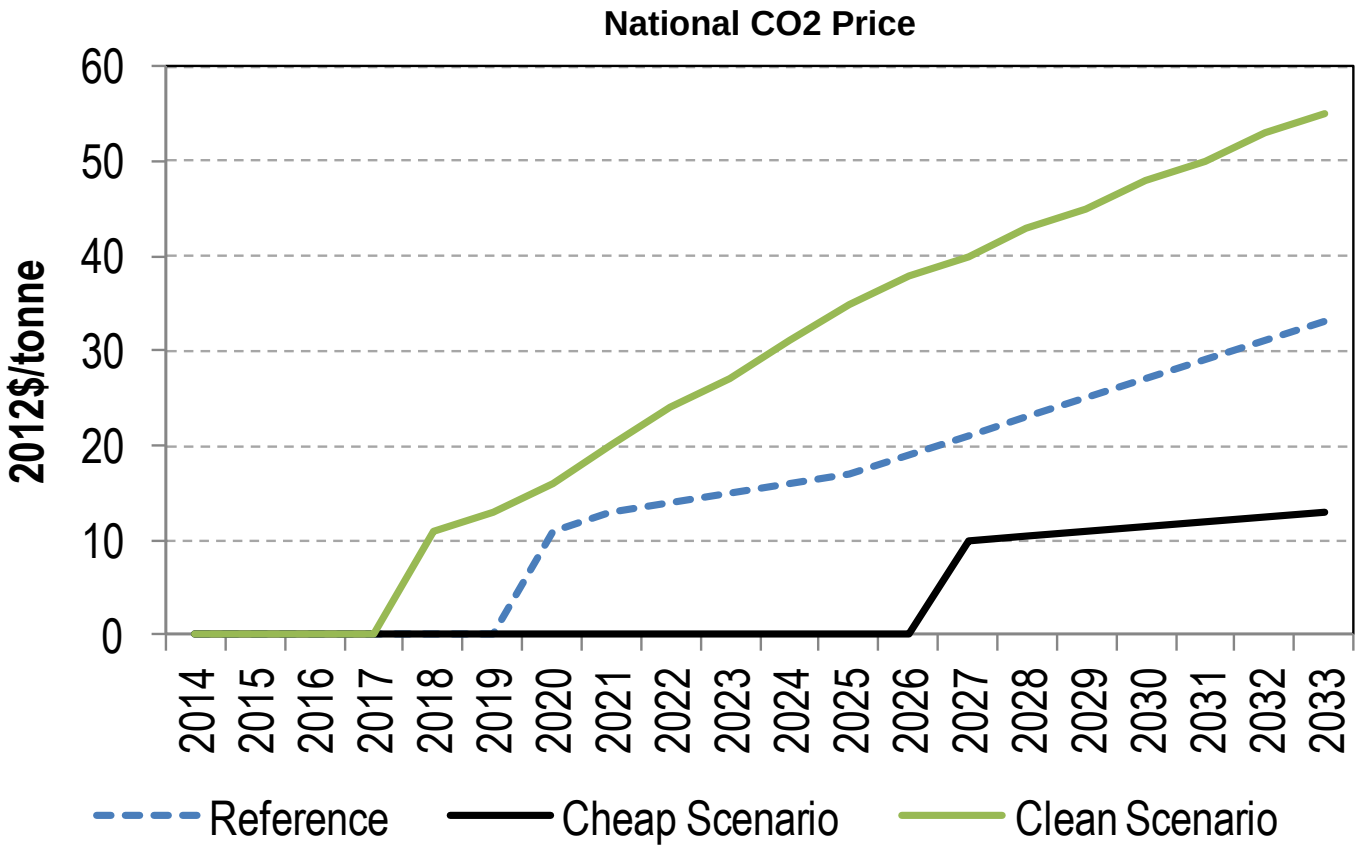
Natural Gas Prices across Scenarios



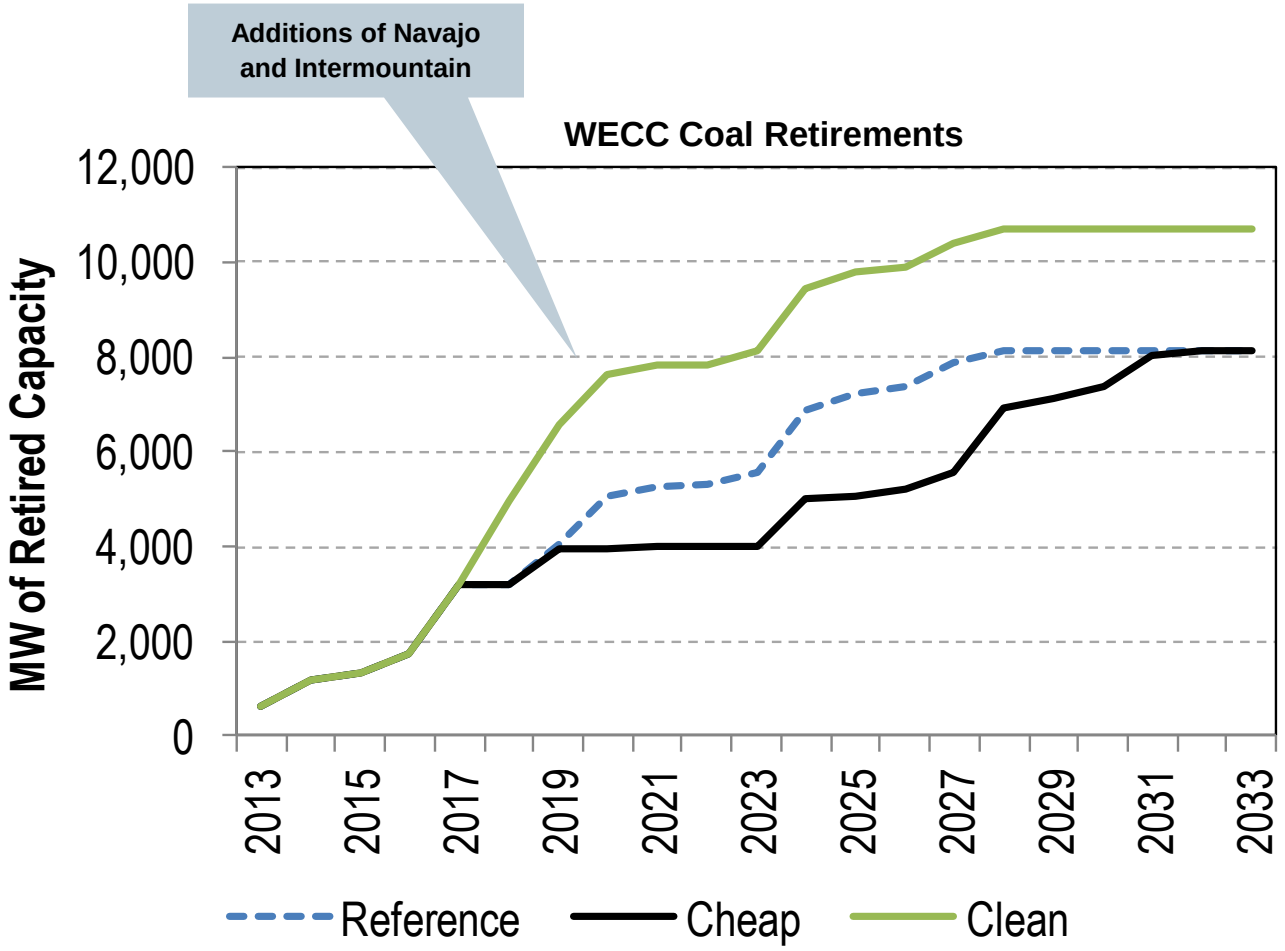
Coal Prices across Scenarios



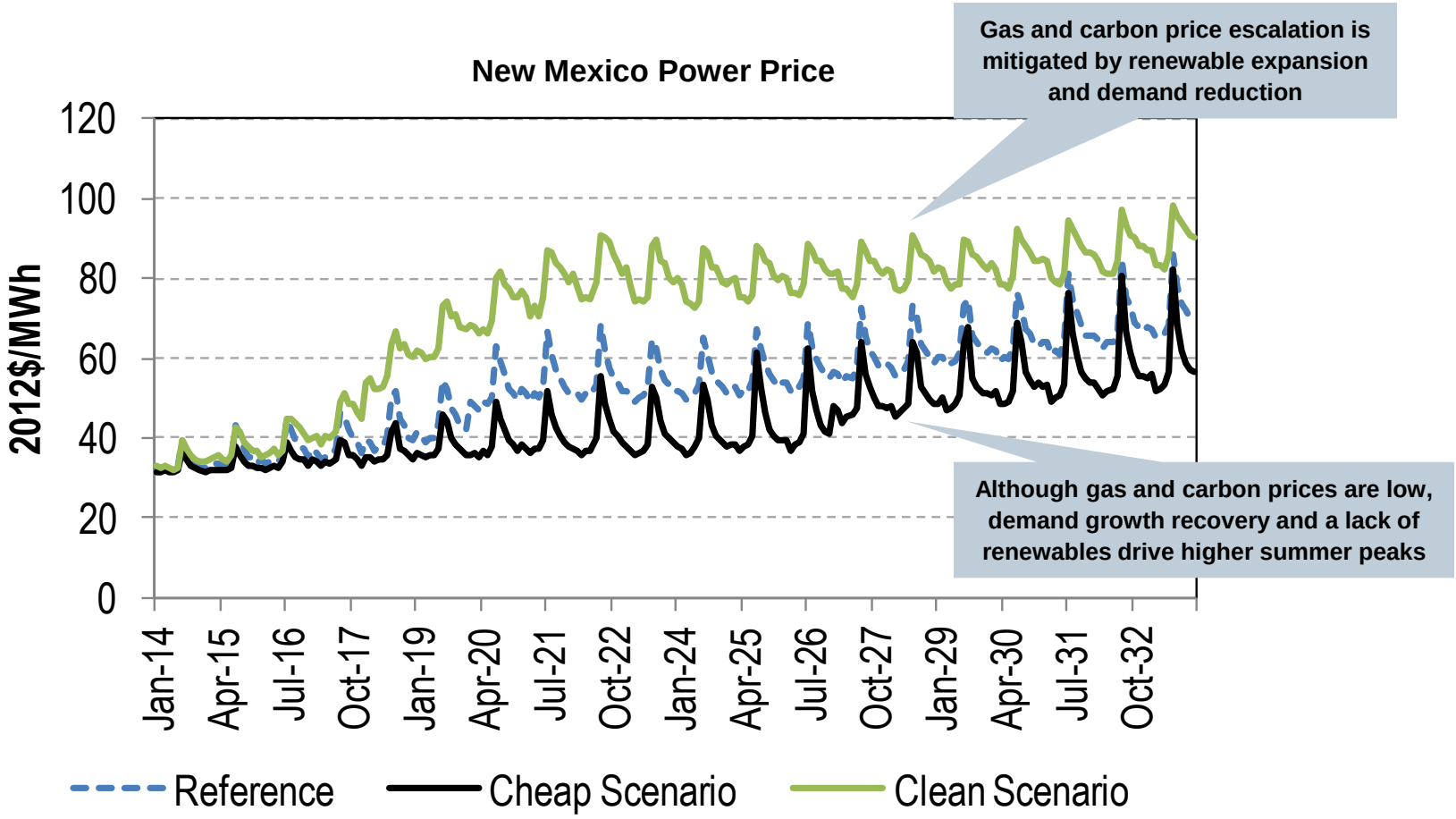
CO2 Prices across Scenarios

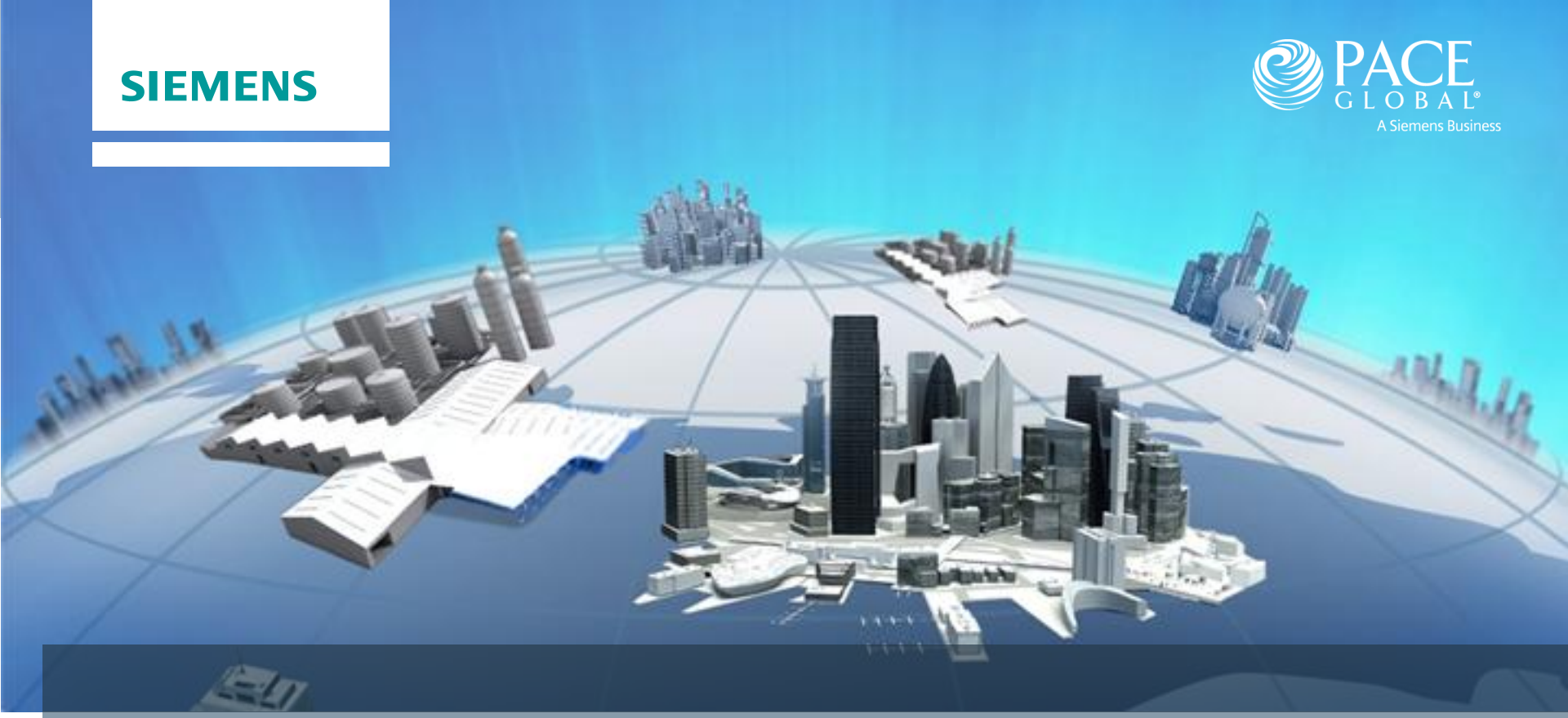


WECC Coal Retirements across Scenarios



Power Prices across Scenarios





Appendix

Cheap – U.S. Macroeconomic and Policy Conditions

Conditions	Short Term 2013-2015	Mid Term 2016-2025	Long Term 2026-2035
Key Drivers	➢ Weak economic recovery places focus on cheap energy	➢ Weak economic recovery ➢ Free trade policies dominate	➢ Moderate economic growth
Key Energy Policy Components	➢ No new regulations other than MATS	➢ Limited support for renewable energy and emissions regulations	➢ Growing but limited environmental policy focus
Fuel and Emission Prices	➢ No CO2 regime ➢ Low fuel prices (gas below $4/MMBtu)	➢ No CO2 regime ➢ Gas prices remain low ($4-5/MMBtu) as LNG exports begin ➢ Coal prices begin to rise due to increased demand and exports	➢ CO2 price introduced ($10/tonne) ➢ Gas price increases to $6/MMBtu as demand grows ➢ Demand for eastern coals declines while PRB demand remains strong
Power Generation Impacts	➢ Low load growth driven by weak economic growth ➢ Low power prices ➢ Announced coal retirements	➢ Electricity demand grows with no focus on efficiency measures ➢ Limited coal retirements	➢ Electricity demand continues to grow rapidly ➢ Slight increase in coal retirements as concern for environment grows

Clean – U.S. Macroeconomic and Policy Conditions

Conditions	Short Term 2013-2015	Mid Term 2016-2025	Long Term 2026-2035
Key Drivers	➢ Strong economic and political conditions ripe for environmental regulations	➢ Economic conditions strong	➢ OECD economic growth declines
Key Energy Policy Components	➢ Strong support for stringent environmental regulation ➢ Strong anti-fossil fuel orientation	➢ OECD largely agrees to common 80% by 2050 carbon target	➢ OECD carbon goals moderated, 50% by 2050 carbon target
Fuel and Emission Prices	➢ Federal CO2 policy passed ➢ Increased gas demand results in higher gas prices ➢ Reduced demand for coal	➢ Federal carbon policy starts in 2018 (~$35/tonne by 2025) ➢ Increasing gas prices (at times reaching $10/MMBtu) ➢ Declining coal use domestically, exports continue	➢ CO2 prices reach $55/tonne ➢Gas prices moderate to $7-8/MMBtu level ➢ Significant coal demand decrease
Power Generation Impacts	➢ Economic recovery leads to strong power demand growth ➢ Environmental policies to drive massive coal retirements	➢ Efficiency policies and load reduction measures result in declining load ➢ Coal retirements reach 140 GW (cumulative) by 2025	➢ Load growth continues to be negative ➢ Coal retirements reach 170 GW (cumulative)

Reference Case Retirement List - WECC

Name	Retirement Date	Retirement Year	Size (MWs)
Apache Station	12/31/2027	2027	350
Arapahoe	5/31/2014	2014	44
Arapahoe	12/31/2019	2019	109
Argus Cogeneration Plant	12/31/2017	2017	50
Ben French	12/31/2015	2015	22
Boardman (OR)	12/30/2020	2020	585
Carbon (UT)	12/31/2014	2014	172
Catalyst Paper Snowflake	12/31/2015	2015	27
Catalyst Paper Snowflake	12/31/2017	2017	46
Centralia Complex	12/31/2019	2019	688
Centralia Complex	12/31/2024	2024	688
Cherokee (CO)	12/30/2016	2016	152
Cholla	12/31/2028	2028	110
Colstrip Energy	12/31/2019	2019	42
Dave Johnston	12/31/2024	2024	212
Dave Johnston	12/31/2023	2023	220
East Third Street	12/31/2022	2022	21
Four Corners	8/31/2013	2013	560
H Wilson Sundt Generating Station	12/31/2021	2021	156
Hayden	12/31/2028	2028	184
J E Corette Plant	12/31/2027	2027	154
Kucc	12/31/2015	2015	50
Kucc	12/31/2017	2017	75
Lamar Plant	12/31/2016	2016	25
Loveridge Road	12/31/2016	2016	20
Martin Drake	12/31/2015	2015	46
Martin Drake	12/31/2016	2016	77
Martin Drake	12/31/2026	2026	131
MT Poso Cogeneration	12/31/2021	2021	57
Naughton	12/31/2020	2020	370
Neil Simpson	3/20/2014	2014	19
Neil Simpson II	12/31/2025	2025	80
Nichols Road Power Plant	12/31/2019	2019	20
Osage (WY)	3/21/2014	2014	30
Phillips 66 Carbon Plant	12/31/2016	2016	19
Port of Stockton District Energy Facility	12/31/2020	2020	51
Raton	12/31/2015	2015	7
Ray D Nixon	12/31/2025	2025	208
Reid Gardner	12/30/2014	2014	330
Reid Gardner	12/30/2017	2017	265
Rio Bravo Jasmin	12/31/2016	2016	33
Rio Bravo Poso	12/31/2016	2016	45
San Juan	12/30/2017	2017	815
Stockton Cogeneration Co	12/31/2023	2023	63
Sunnyside Cogeneration Associates	12/31/2025	2025	51
Torrance Refinery	12/31/2016	2016	8
Valmont	12/31/2017	2017	186
W N Clark	12/31/2013	2013	43
Wilbur East Power Plant	12/31/2016	2016	20
Wilbur West Power Plant	12/31/2020	2020	21
Wyodak	12/31/2024	2024	335
Yellowstone Energy LP	12/31/2024	2024	65

*Note that the San Onofre Nuclear Generation Station (SONGS) in California is retired across all cases.

Cheap Scenario Retirement List - WECC

Name	Retirement Date	Retirement Year	Size (MWs)	Date Change from Reference
Apache Station	12/31/2027	2027	350	
Arapahoe	5/31/2014	2014	44	
Arapahoe	12/31/2028	2028	109	X
Argus Cogeneration Plant	12/31/2017	2017	50	
Ben French	12/31/2015	2015	22	
Boardman (OR)	12/31/2028	2028	585	X
Carbon (UT)	12/31/2014	2014	172	
Catalyst Paper Snowflake	12/31/2015	2015	27	
Catalyst Paper Snowflake	12/31/2017	2017	46	
Centralia Complex	12/31/2019	2019	688	
Centralia Complex	12/31/2024	2024	688	
Cherokee (CO)	12/30/2016	2016	152	
Cholla	12/31/2028	2028	110	
Colstrip Energy	12/31/2019	2019	42	
Dave Johnston	12/31/2031	2031	432	X
East Third Street	12/31/2032	2032	21	X
Four Corners	8/31/2013	2013	560	
H Wilson Sundt Generating Station	12/31/2030	2030	156	X
Hayden	12/31/2028	2028	184	
J E Corette Plant	12/31/2029	2029	154	X
Kucc	12/31/2015	2015	50	
Kucc	12/31/2017	2017	75	
Lamar Plant	12/31/2016	2016	25	
Loveridge Road	12/31/2016	2016	20	
Martin Drake	12/31/2015	2015	46	
Martin Drake	12/31/2016	2016	77	
Martin Drake	12/31/2026	2026	131	
MT Poso Cogeneration	12/31/2021	2021	57	
Naughton	12/31/2028	2028	370	X
Neil Simpson	3/20/2014	2014	19	
Neil Simpson II	12/31/2030	2030	80	X
Nichols Road Power Plant	12/31/2019	2019	20	
Osage (WY)	3/21/2014	2014	30	
Phillips 66 Carbon Plant	12/31/2016	2016	19	
Port of Stockton District Energy Facility	12/31/2032	2032	51	X
Raton	12/31/2015	2015	7	
Ray D Nixon	12/31/2031	2031	208	X
Reid Gardner	12/30/2014	2014	330	
Reid Gardner	12/30/2017	2017	265	
Rio Bravo Jasmin	12/31/2016	2016	33	
Rio Bravo Poso	12/31/2016	2016	45	
San Juan	12/30/2017	2017	815	
Stockton Cogeneration Co	12/31/2032	2032	63	X
Sunnyside Cogeneration Associates	12/31/2025	2025	51	
Torrance Refinery	12/31/2016	2016	8	
Valmont	12/31/2017	2017	186	
W N Clark	12/31/2013	2013	43	
Wilbur East Power Plant	12/31/2016	2016	20	
Wilbur West Power Plant	12/31/2020	2020	21	
Wyodak	12/31/2024	2024	335	
Yellowstone Energy LP	12/31/2029	2029	65	X

*Note that the San Onofre Nuclear Generation Station (SONGS) in California is retired across all cases.

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Catalyst Paper Snowflake	12/31/2017	2017	46
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Centralia Complex	12/31/2024	2024	688
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Cholla	12/31/2028	2028	110
Colstrip Energy	12/31/2019	2019	42
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Dave Johnston	12/31/2023	2023	220
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Lamar Plant	12/31/2016	2016	25
Loveridge Road	12/31/2016	2016	20
Martin Drake	12/31/2015	2015	46
Martin Drake	12/31/2016	2016	77
Martin Drake	12/31/2026	2026	131
MT Poso Cogeneration	12/31/2021	2021	57
Naughton	12/31/2020	2020	370
Neil Simpson	3/20/2014	2014	19
Neil Simpson II	12/31/2025	2025	80
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W N Clark	12/31/2013	2013	43
Wilbur East Power Plant	12/31/2016	2016	20
Wilbur West Power Plant	12/31/2020	2020	21
Wyodak	12/31/2024	2024	335
Yellowstone Energy LP	12/31/2024	2024	65
Navajo	12/31/2019	2019	750
Intermountain	12/31/2018	2018	1800

*Note that Navajo and Intermountain are additional plants for retirement beyond the Reference Case.

*Note that the San Onofre Nuclear Generation Station (SONGS) in California is retired across all cases.