

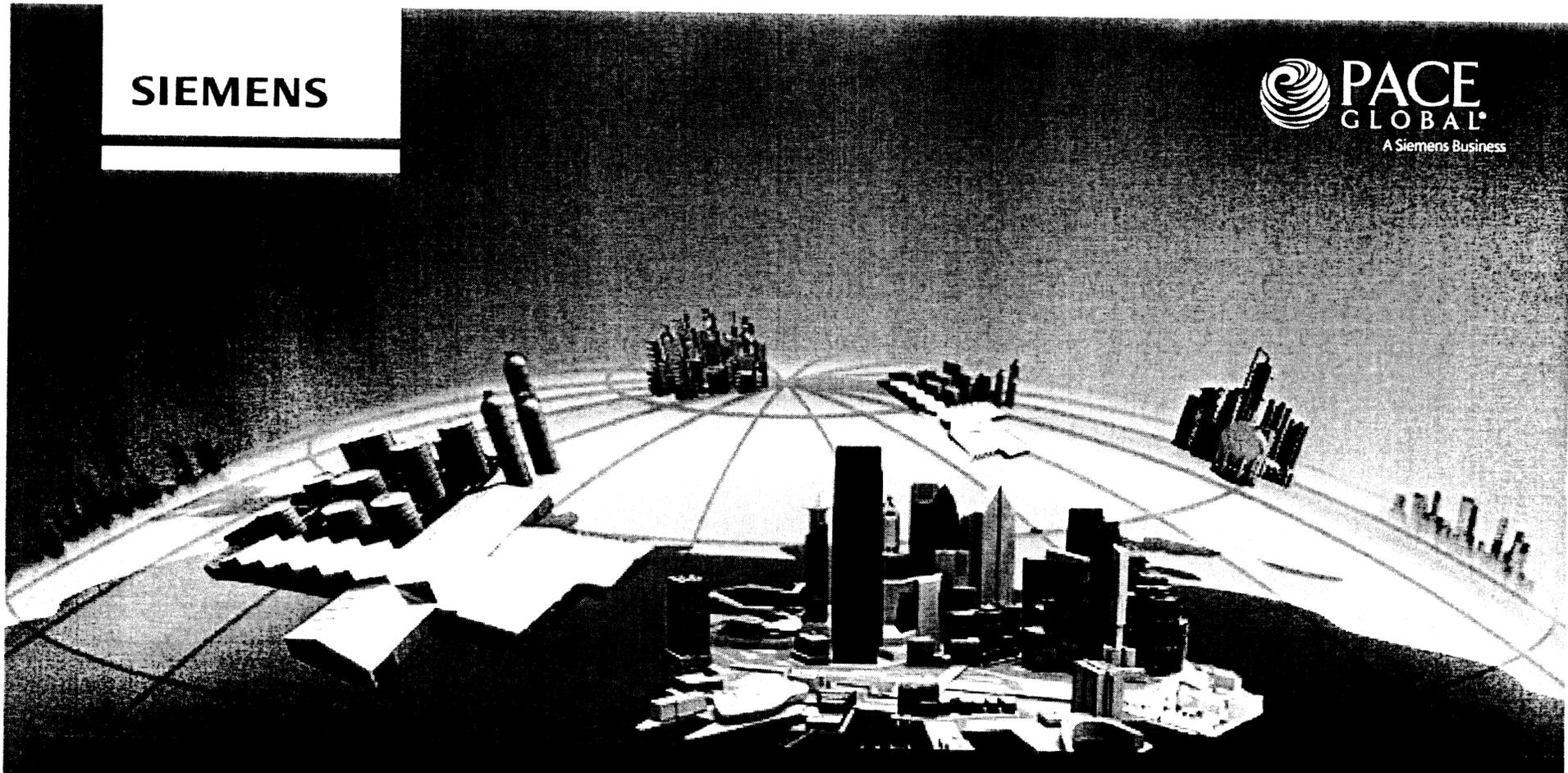
**PNM EXHIBIT PJO-5**

**Part 3 of 3**

**Consisting of 23 pages**

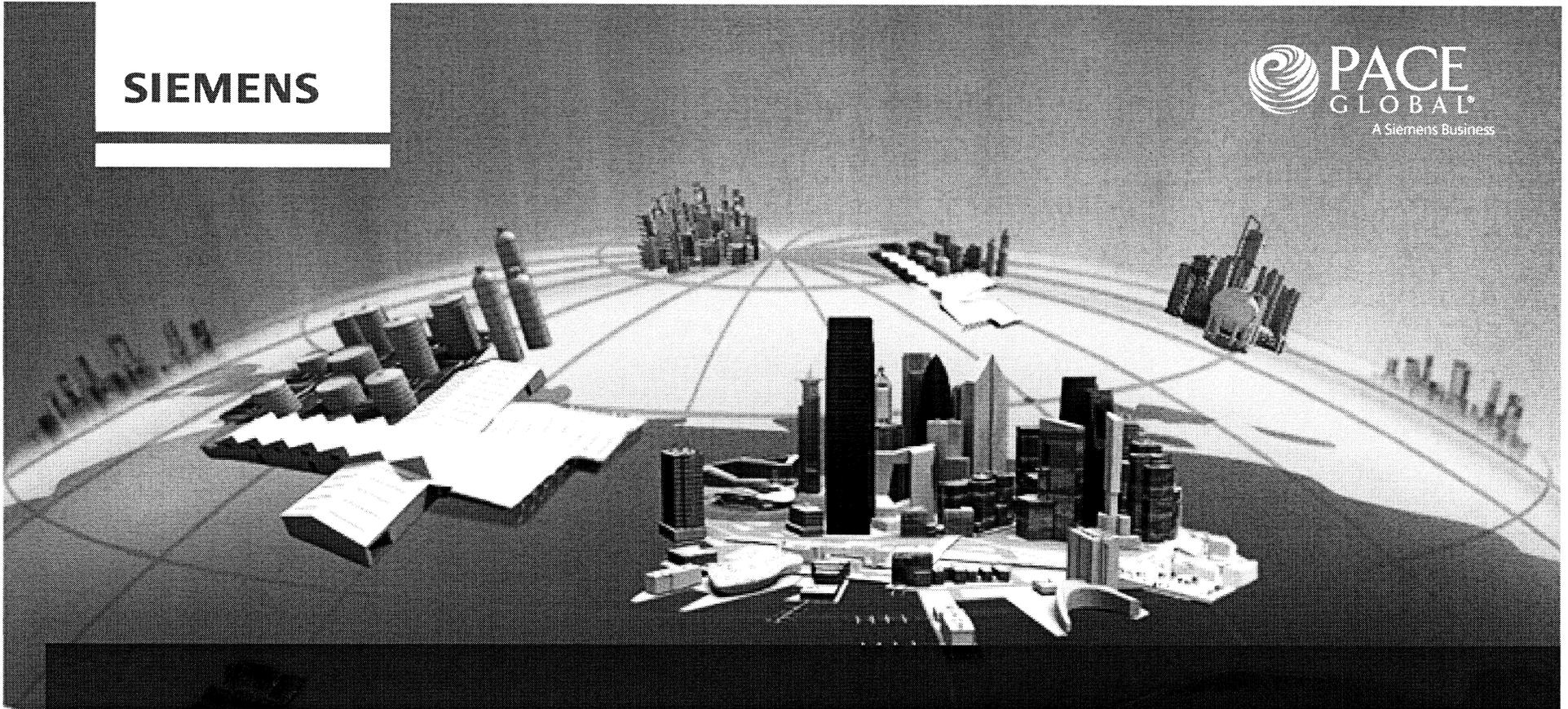
SIEMENS

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A Siemens Business



# MarketLink Scenario Summary

Prepared for PNM



# Summary of Key Scenario Drivers and Outcomes

## MarketLink Scenarios: An Overview

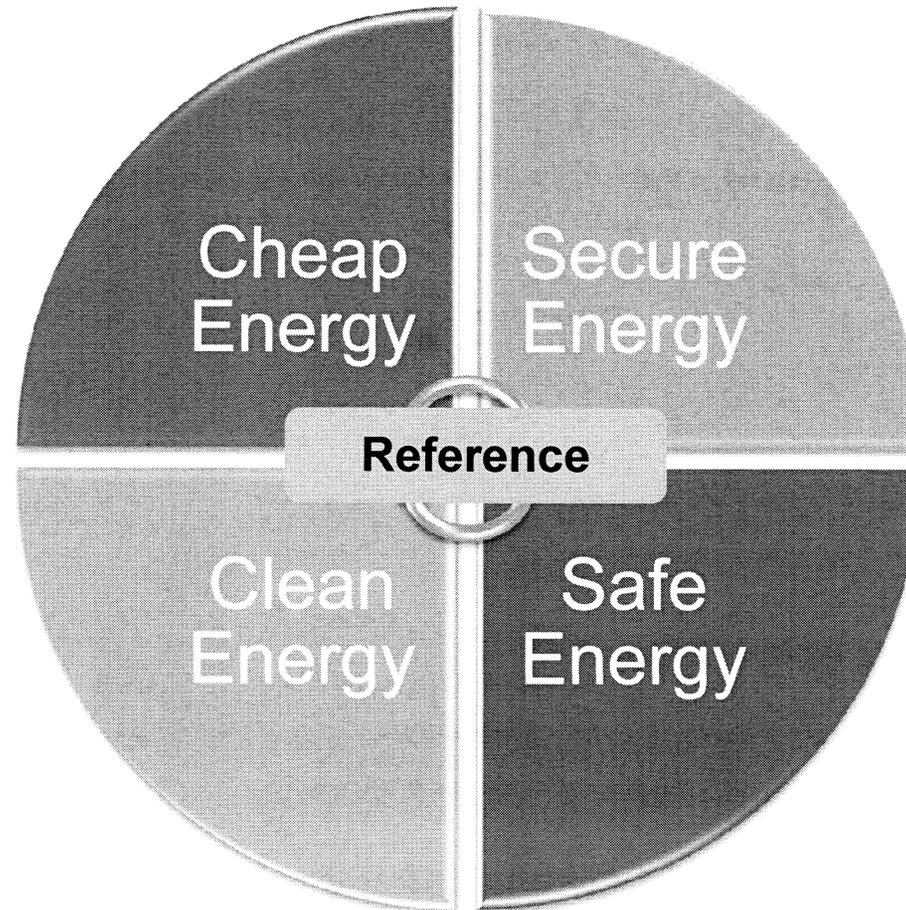
Pace Global's MarketLink scenarios are a set of four internally-consistent states of the world developed against a backdrop of changing policy frameworks over time

- The prevalence of certain geopolitical, environmental, and macroeconomic conditions can lead policy makers to focus near-term on one of several competing aspects of energy policy:
  - Costs
  - Environmental Protection
  - Energy Security
  - Safety
- As the geopolitical, environmental, and economic conditions change, energy policy is likely to shift away from the predominant near-term focus into other competing objectives
  - Market and regulatory response feedbacks over time
- Each scenario is developed by carefully evaluating the relationships and correlations between energy policy and the fundamentals of fuel and power markets
- The scenarios are intended to push the envelope of potential outcomes; in other words, they are plausible, but low probability

# MarketLink Scenarios: Alternative Energy Market Futures

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

Strong environmental policy results in high CO<sub>2</sub> price, many coal retirements, and significant renewable expansion; power sector demand and fracking ban results in high gas prices

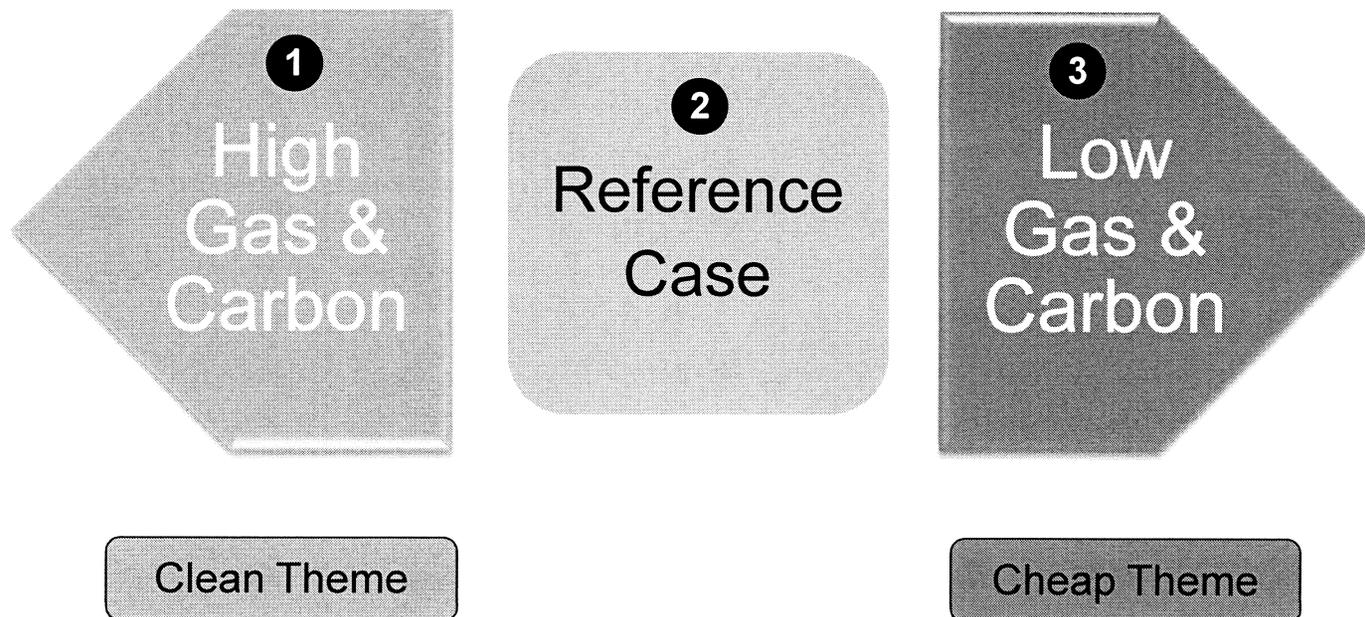


Near term shock to oil and gas prices results in push for diverse domestic supply; opposition to exports, low gas prices longer term

Nuclear phase out with continued pressure on coal capacity; flat demand growth; pressure on gas prices

## Theme Development for IRP Analysis

- Pace Global and PNM identified natural gas price and carbon price as the two major drivers of portfolio performance
- The “Clean” and “Cheap” MarketLink themes drive gas and carbon prices in opposite directions, based on the underlying economic and regulatory drivers. These themes were used to define the selection of scenarios for use in the analysis.
- Three scenarios were deployed:



# Reference Case

Conditions	Short Term 2013-2015	Mid Term 2016-2025	Long Term 2026-2035
<b>Environmental Regulations</b>	➤MATS remains on track for 2016 implementation	➤Possibility of additional regulations, e.g. revised CSAPR	➤Gradual tightening of emissions restrictions
<b>Natural Gas Prices (HH and Permian)</b>	➤NYMEX Forwards to 2015	➤Gas prices move towards range of \$5-6/MMBtu	➤Gas price increases towards a range of \$6-7/MMBtu
<b>Gas Market Factors</b>	➤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
<b>CO2 Prices</b>	➤No CO2 regime	➤Modest CO2 regime starts in 2020 (~\$10/tonne)	➤CO2 prices above \$30/tonne in the 2030s
<b>PRB Coal Price</b>	➤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
<b>National Coal Retirements</b>	➤Announced (up to 25 GW)	➤10-15 GW (up to 40 GW cumulative)	➤30-50 GW (up to 90 GW cumulative)
<b>Regional Power Sector Load Growth</b>	➤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
<b>Power Sector Expansion</b>	➤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.

Note: All values represented in 2012\$

# Low Gas & Carbon Scenario



Conditions	Short Term 2013-2015	Mid Term 2016-2025	Long Term 2026-2035
<b>Environmental Regulations</b>	<ul style="list-style-type: none"> <li>➢ Potential delays/extensions for MATS compliance</li> </ul>	<ul style="list-style-type: none"> <li>➢ No new environmental regulations</li> </ul>	<ul style="list-style-type: none"> <li>➢ Limited environmental regulations</li> </ul>
<b>Natural Gas Prices (HH and Permian)</b>	<ul style="list-style-type: none"> <li>➢ Gas prices remain &lt;\$4/MMBtu</li> </ul>	<ul style="list-style-type: none"> <li>➢ ~\$4-5/MMBtu as LNG exports begin</li> </ul>	<ul style="list-style-type: none"> <li>➢ Gas price gradually increases to \$6/MMBtu</li> </ul>
<b>Gas Market Factors</b>	<ul style="list-style-type: none"> <li>➢ Rapid decline in San Juan Basin production; accelerated growth in pipeline exports</li> </ul>	<ul style="list-style-type: none"> <li>➢ Sustained growth of Gulf Coast LNG exports; robust associated gas development</li> </ul>	<ul style="list-style-type: none"> <li>➢ Production costs edge up as associated gas development declines</li> </ul>
<b>CO2 Prices</b>	<ul style="list-style-type: none"> <li>➢ No CO2 regime</li> </ul>	<ul style="list-style-type: none"> <li>➢ No CO2 regime</li> </ul>	<ul style="list-style-type: none"> <li>➢ CO2 price introduced (\$10/tonne)</li> </ul>
<b>PRB Coal Price</b>	<ul style="list-style-type: none"> <li>➢ PRB 8800 0.80 in the range of \$11-13/ton plus transport</li> </ul>	<ul style="list-style-type: none"> <li>➢ PRB 8800 0.80 in the range of \$14-18/ton plus transport</li> </ul>	<ul style="list-style-type: none"> <li>➢ PRB 8800 0.80 &gt;\$20/ton a short ton plus elevated transportation costs, due to high demand</li> </ul>
<b>National Coal Retirements</b>	<ul style="list-style-type: none"> <li>➢ Announced, with some reversals (up to 15 GW)</li> </ul>	<ul style="list-style-type: none"> <li>➢ Limited coal retirements, &lt;5GW (up to 20 GW cumulative). Mostly due to local and regional growth factors.</li> </ul>	<ul style="list-style-type: none"> <li>➢ Slight increase in coal retirements as concern for environment grows. 10-15GW (up to 35 MW cumulative) of older less efficient plants</li> </ul>
<b>Regional Power Sector Load Growth</b>	<ul style="list-style-type: none"> <li>➢ Low load growth (0%-0.5%)</li> </ul>	<ul style="list-style-type: none"> <li>➢ Demand growth recovery (1.5%)</li> </ul>	<ul style="list-style-type: none"> <li>➢ Demand growth recovery (2%)</li> </ul>
<b>Power Sector Expansion</b>	<ul style="list-style-type: none"> <li>➢ Replacement of coal retirements with gas and renewables in advanced development</li> </ul>	<ul style="list-style-type: none"> <li>➢ Gas build out to meet demand growth with moderate expansion of wind in Midwest and solar in Southwest</li> </ul>	<ul style="list-style-type: none"> <li>➢ Limited renewable expansion; demand growth met through gas generation.</li> </ul>

Note: All values represented in 2012\$

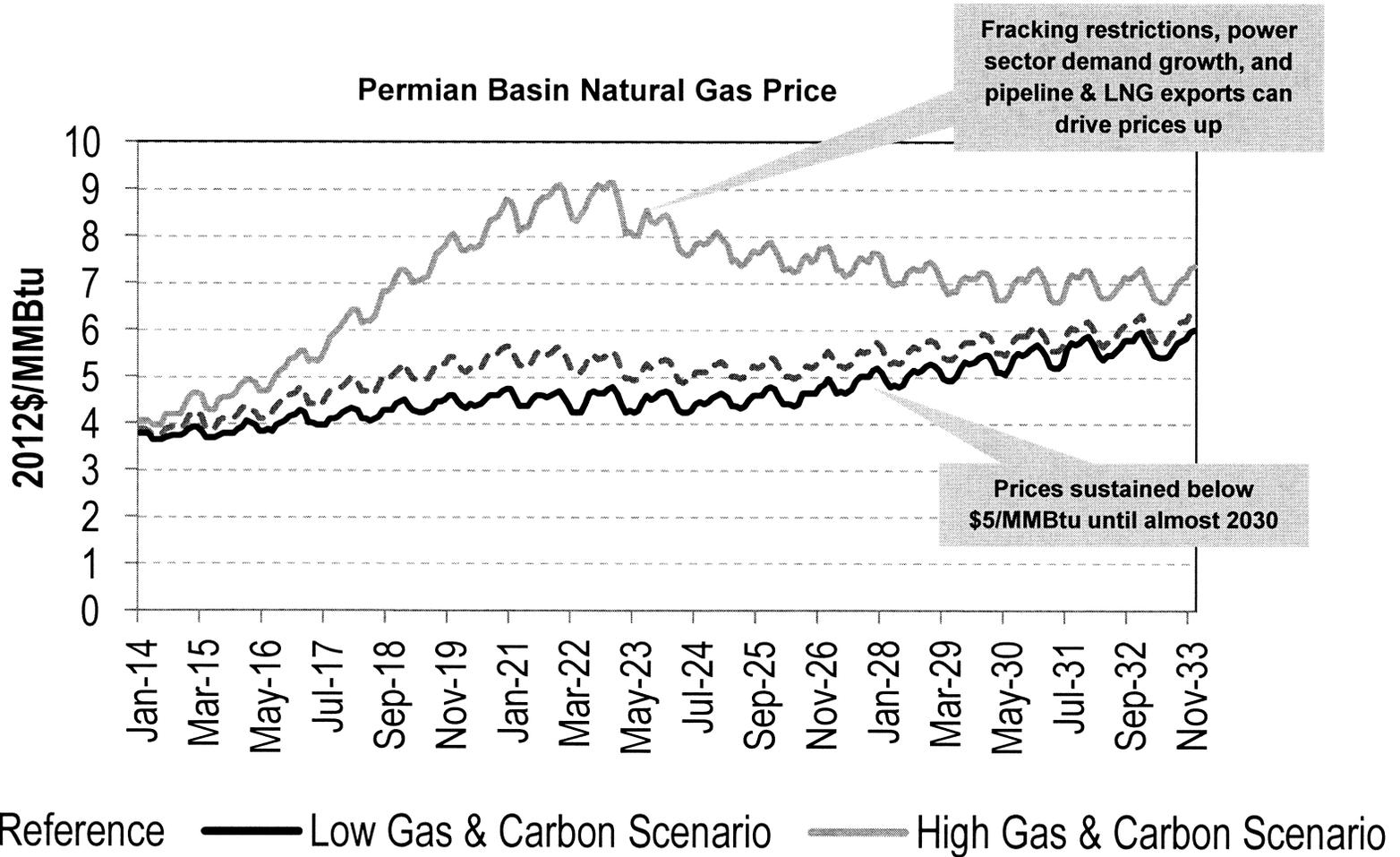
# High Gas & Carbon Scenario



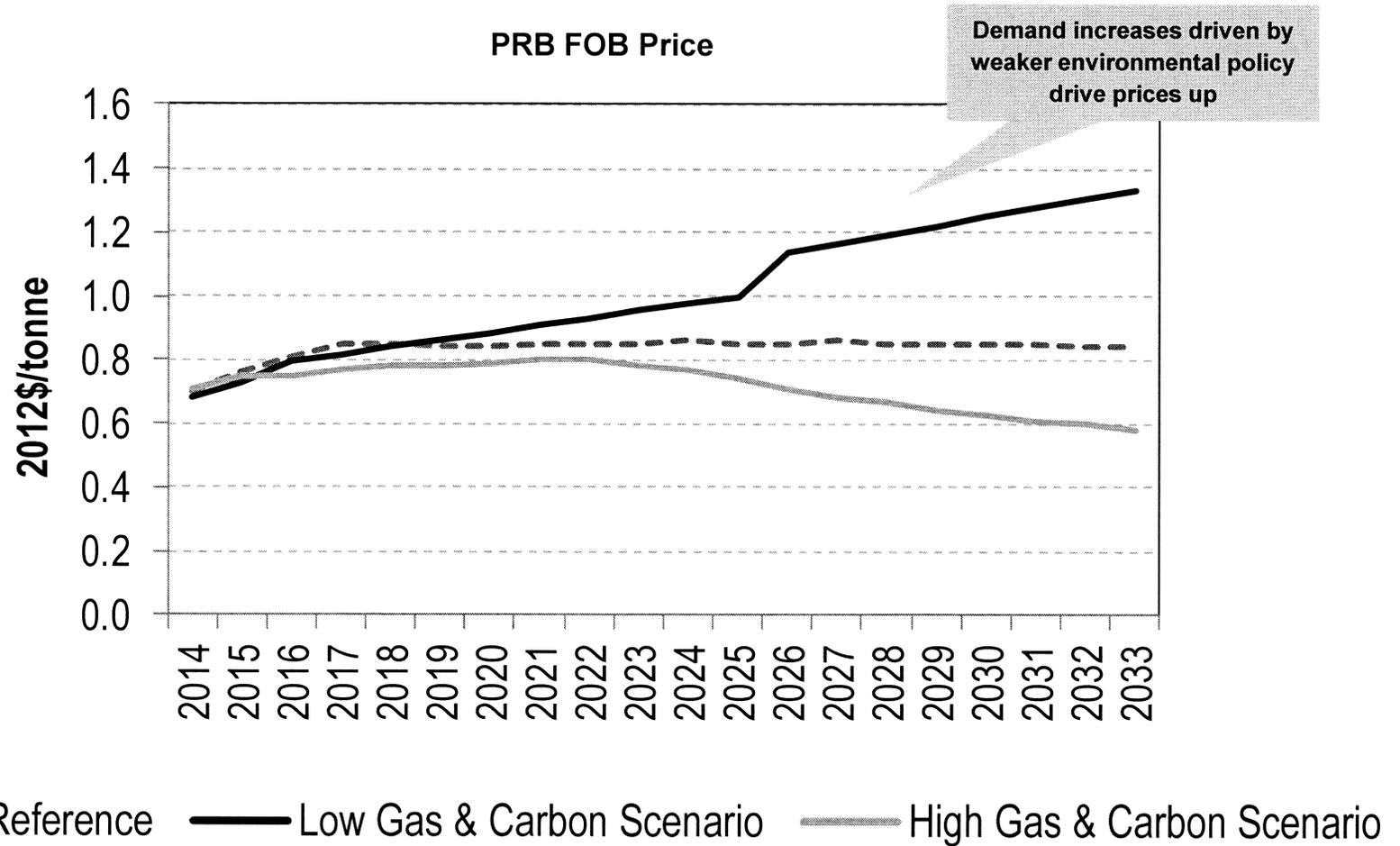
Conditions	Short Term 2013-2015	Mid Term 2016-2025	Long Term 2026-2035
<b>Environmental Regulations</b>	<ul style="list-style-type: none"> <li>➢ MATS remains on track for 2016 implementation</li> </ul>	<ul style="list-style-type: none"> <li>➢ Continued new regulations: revised CSAPR, regional haze, ash disposal, Federal RPS</li> </ul>	<ul style="list-style-type: none"> <li>➢ Regulations increasingly restrict ability of coal-fired plants to remain economical</li> </ul>
<b>Natural Gas Prices (HH and Permian)</b>	<ul style="list-style-type: none"> <li>➢ Gas price rises to \$5/MMBtu</li> </ul>	<ul style="list-style-type: none"> <li>➢ Power sector demand and fracking restrictions result in price runups to \$10/MMBtu</li> </ul>	<ul style="list-style-type: none"> <li>➢ Some feedback to revert back to \$7-8/MMBtu levels</li> </ul>
<b>Gas Market Factors</b>	<ul style="list-style-type: none"> <li>➢ Supply/demand similar to reference case; many states move to ban or sharply restrict fracking</li> </ul>	<ul style="list-style-type: none"> <li>➢ EPA institutes fracking restrictions; drilling declines by 50%; LNG export construction stops; LNG imports increase</li> </ul>	<ul style="list-style-type: none"> <li>➢ EPA relaxes some drilling restrictions; rapid recovery of San Juan Basin CBM, other dry gas production</li> </ul>
<b>CO2 Prices</b>	<ul style="list-style-type: none"> <li>➢ Federal CO2 policy passed</li> </ul>	<ul style="list-style-type: none"> <li>➢ Federal carbon policy starts in 2018 (~\$35/tonne by 2025)</li> </ul>	<ul style="list-style-type: none"> <li>➢ CO2 prices reach \$55/tonne</li> </ul>
<b>PRB Coal Price</b>	<ul style="list-style-type: none"> <li>➢ PRB 8800 0.80 in the range of \$12-14/ton plus transport</li> </ul>	<ul style="list-style-type: none"> <li>➢ PRB 8800 0.80 in the range of \$12-14/ton plus transport</li> </ul>	<ul style="list-style-type: none"> <li>➢ PRB 8800 0.80 in the range of \$10-12/ton plus softened transport costs</li> </ul>
<b>National Coal Retirements</b>	<ul style="list-style-type: none"> <li>➢ Announced retirements</li> </ul>	<ul style="list-style-type: none"> <li>➢ Stricter policy, including CO2, drives up to 140 GW of coal (cumulative) out by 2025</li> </ul>	<ul style="list-style-type: none"> <li>➢ Stricter policy, including CO2, drives up to 170 GW of coal (cumulative) out through 2035</li> </ul>
<b>Regional Power Sector Load Growth</b>	<ul style="list-style-type: none"> <li>➢ Load recovery (1.25%)</li> </ul>	<ul style="list-style-type: none"> <li>➢ Efficiency/DSM penetration (0.5%)</li> </ul>	<ul style="list-style-type: none"> <li>➢ Efficiency/DSM penetration (-0.5%)</li> </ul>
<b>Power Sector Expansion</b>	<ul style="list-style-type: none"> <li>➢ Gas replaces retired coal with renewables significantly increasing share in West and Midwest</li> </ul>	<ul style="list-style-type: none"> <li>➢ Federal RPS sets 15% floor with most states, outside of SERC and RFC, reaching &gt;25%</li> </ul>	<ul style="list-style-type: none"> <li>➢ Strict environmental regulations and storage advances drive cost of renewables below fossil generation driving &gt;30% penetration</li> </ul>

*Note: All values represented in 2012\$*

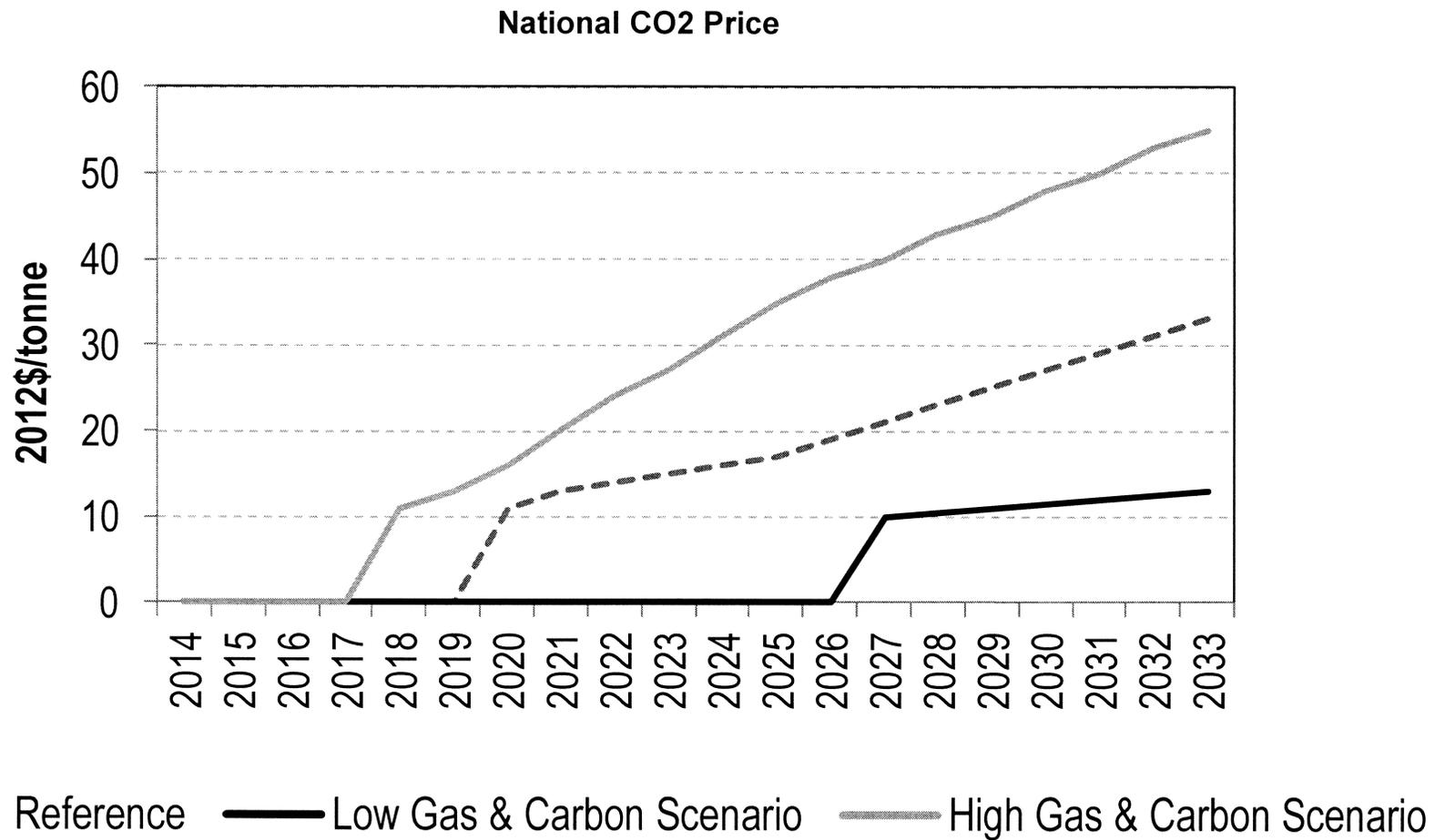
# Natural Gas Prices across Scenarios



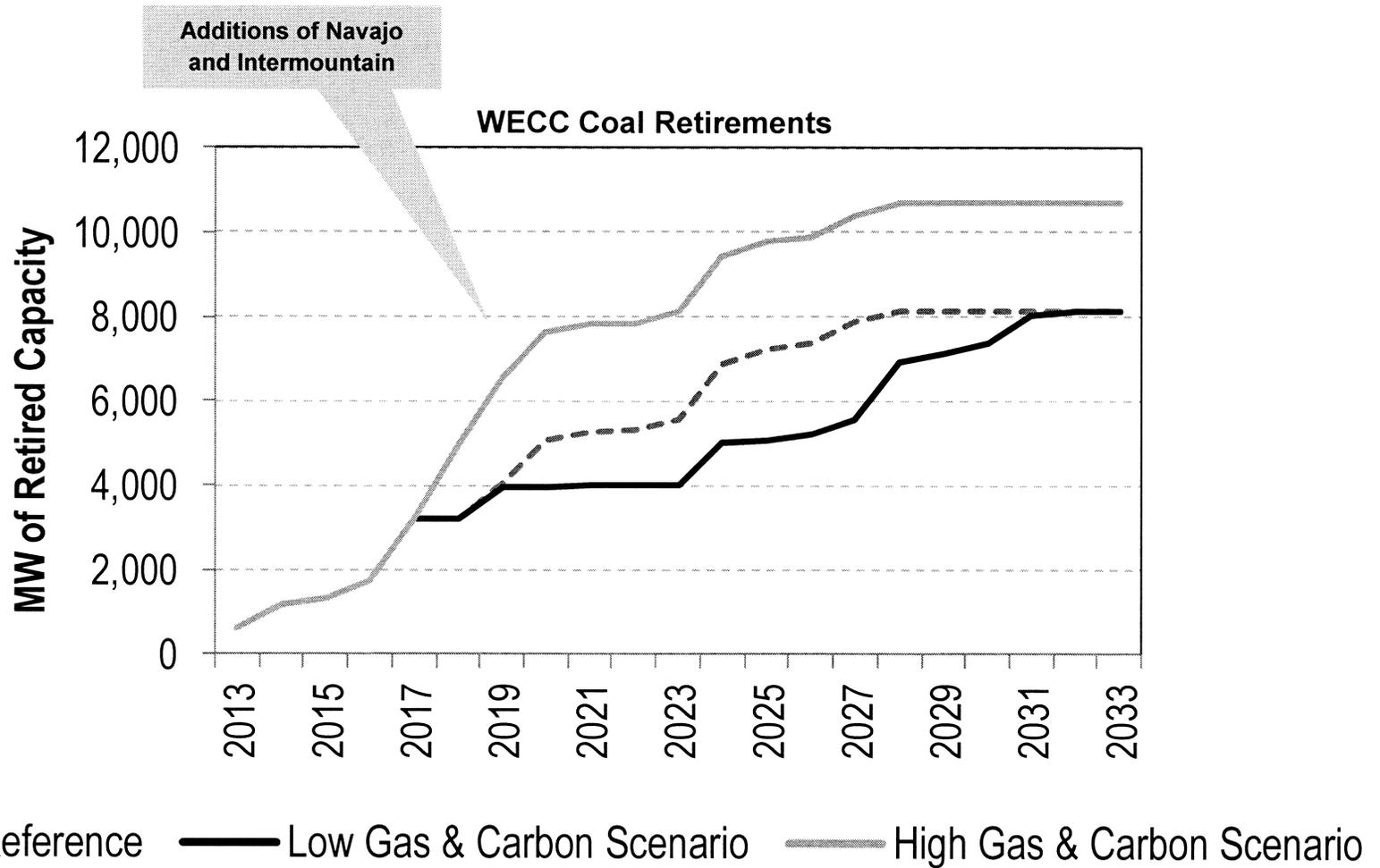
# Coal Prices across Scenarios



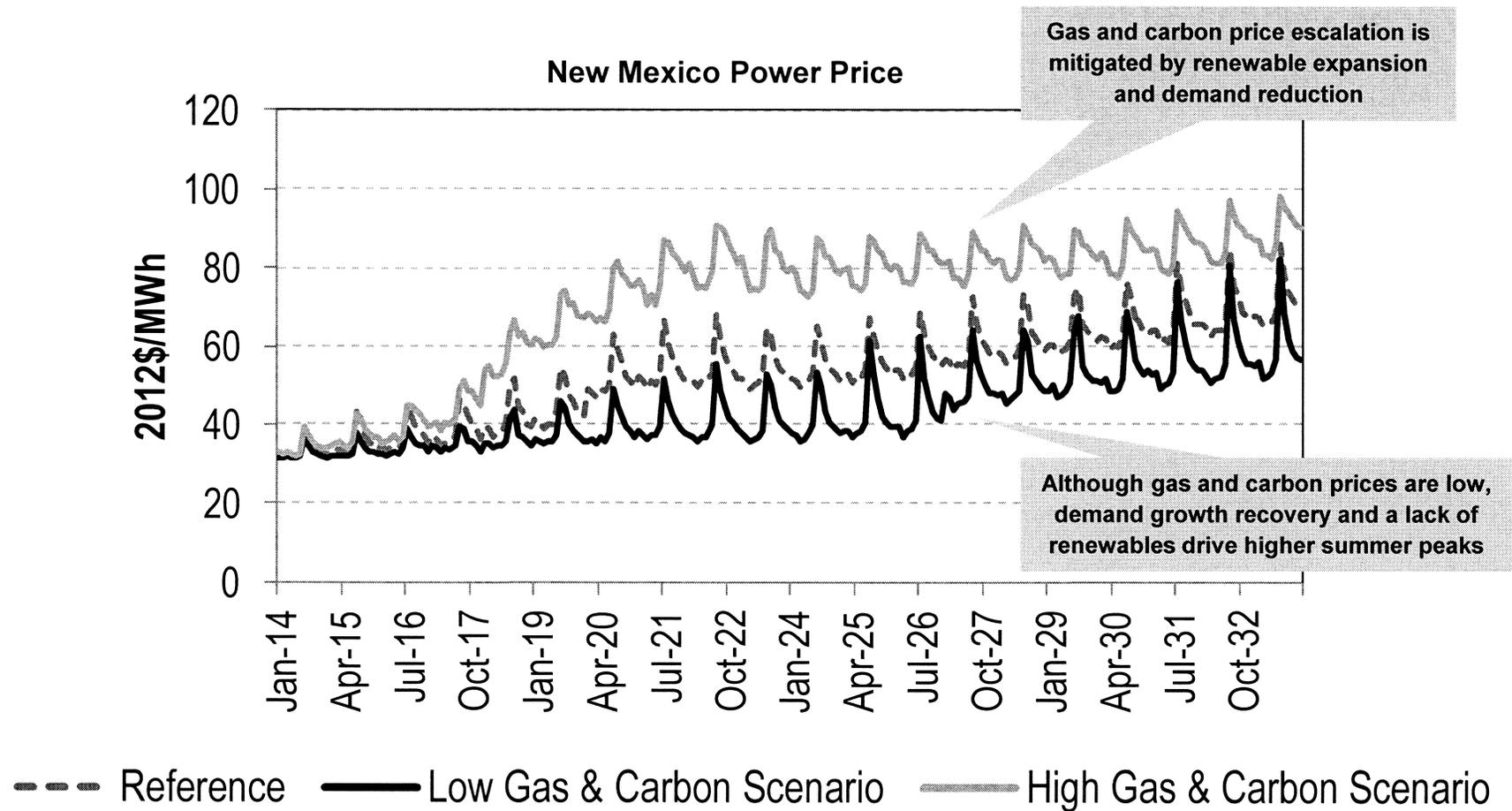
# CO2 Prices across Scenarios

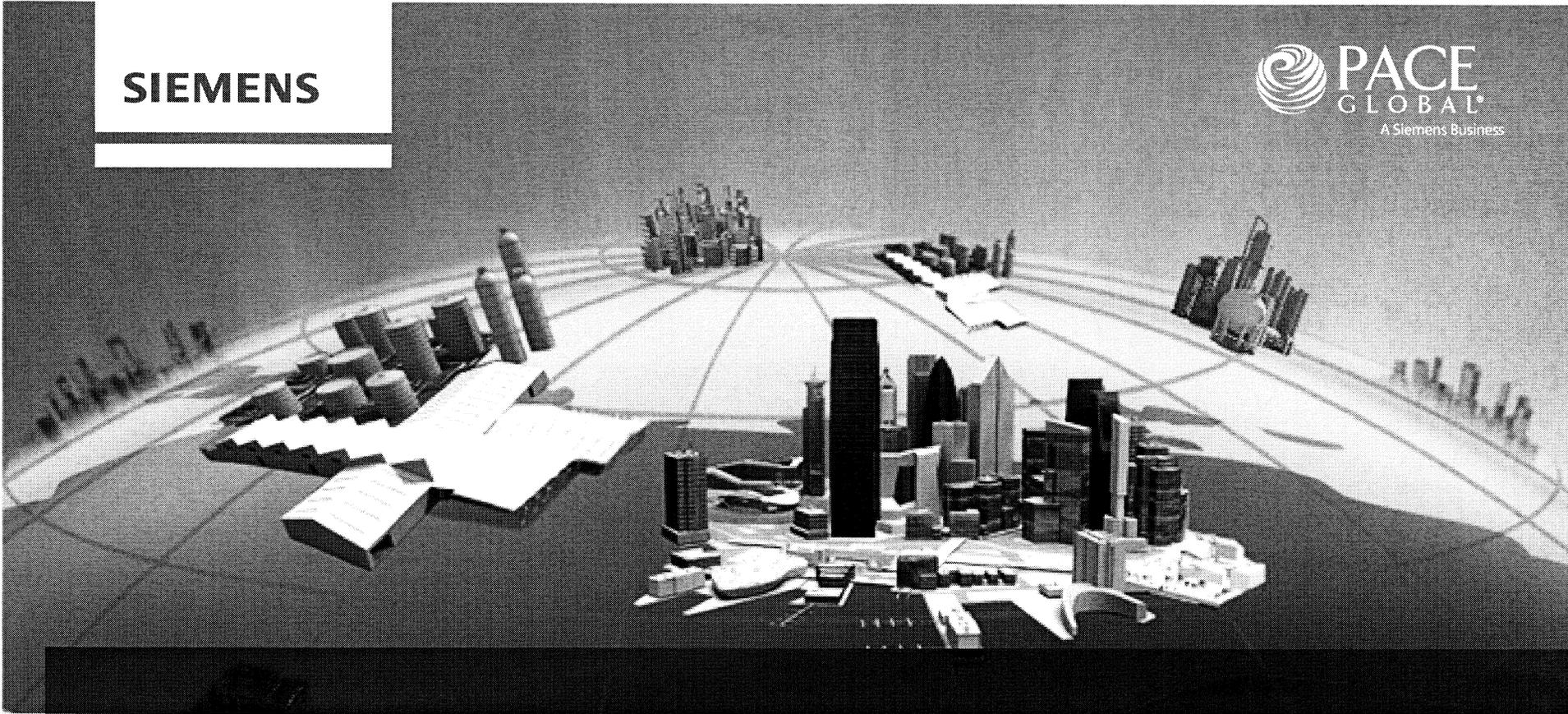


# WECC Coal Retirements across Scenarios



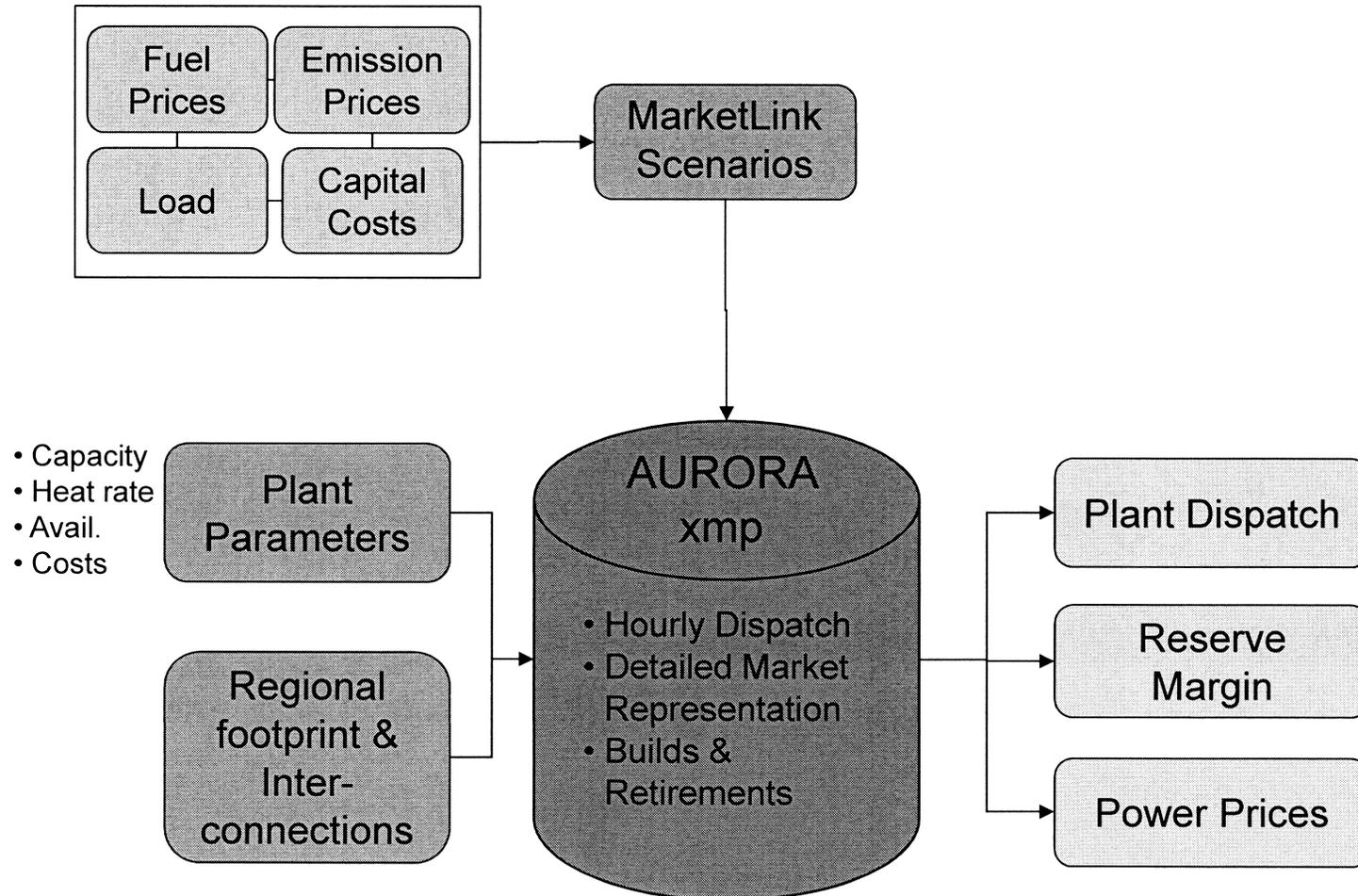
# Power Prices across Scenarios



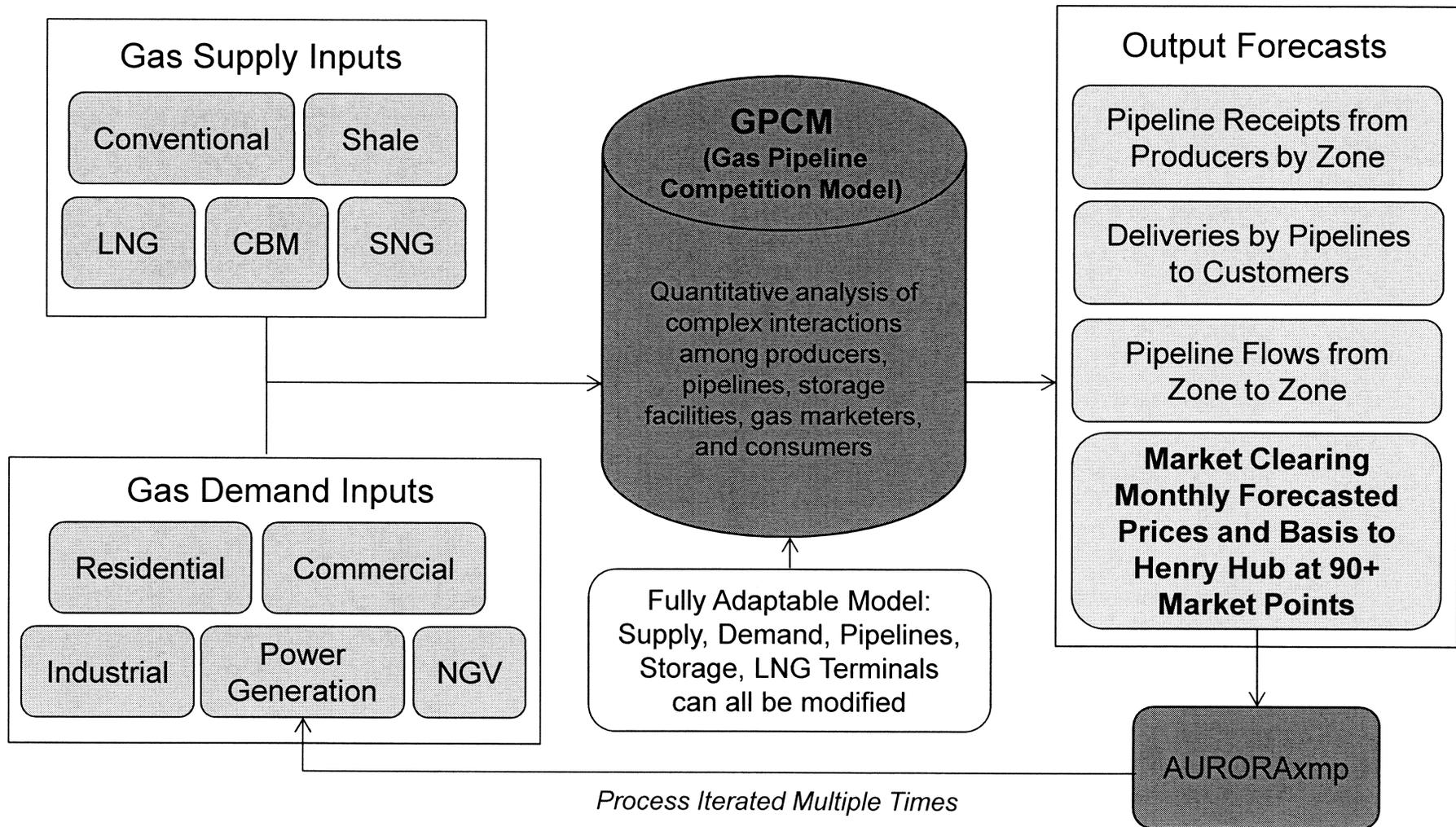


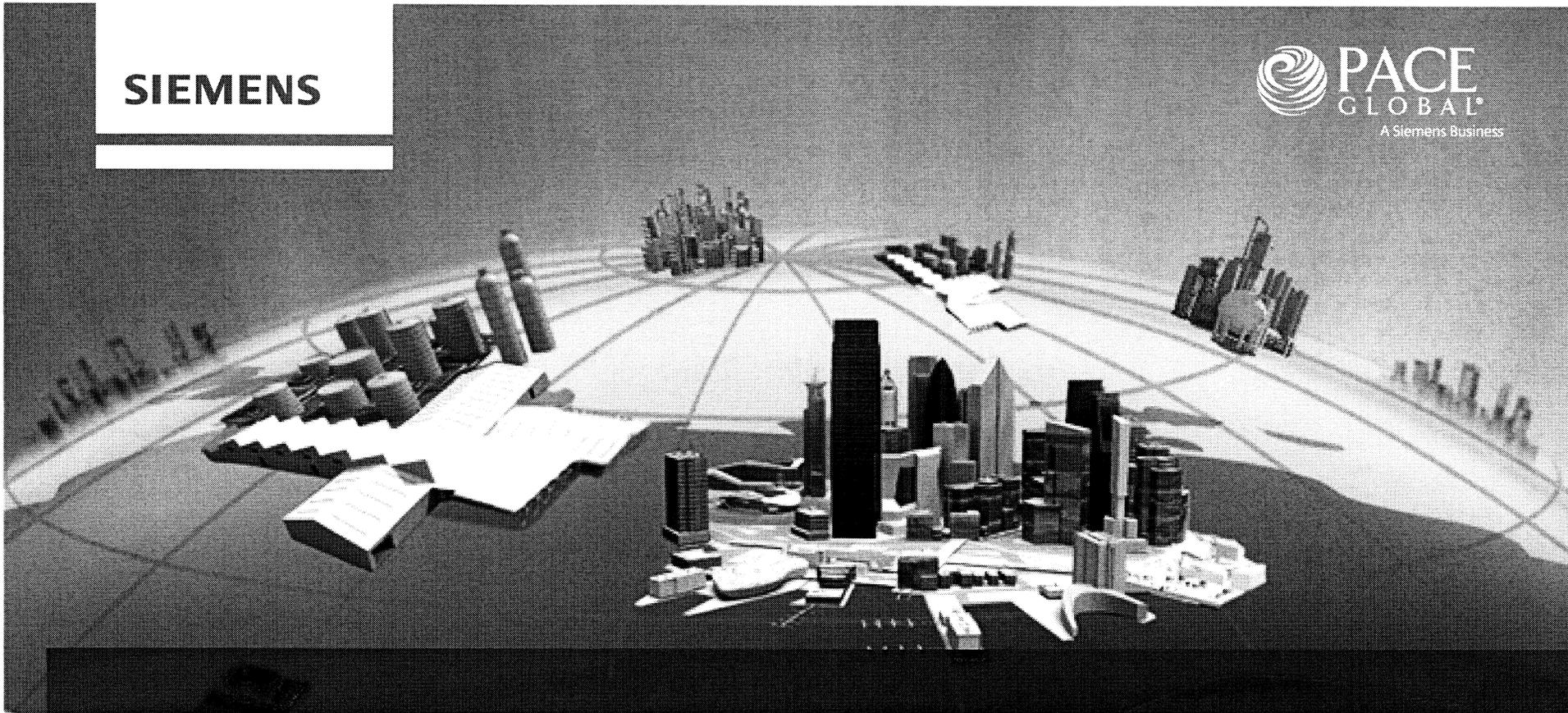
# Appendix: Modeling Methodology

# Pace Global Power Market Analysis Process



# Pace Global Natural Gas Market Analysis Process





# Appendix: Macroeconomic Conditions

# Low Gas & Carbon Scenario – U.S. Macroeconomic and Policy Conditions

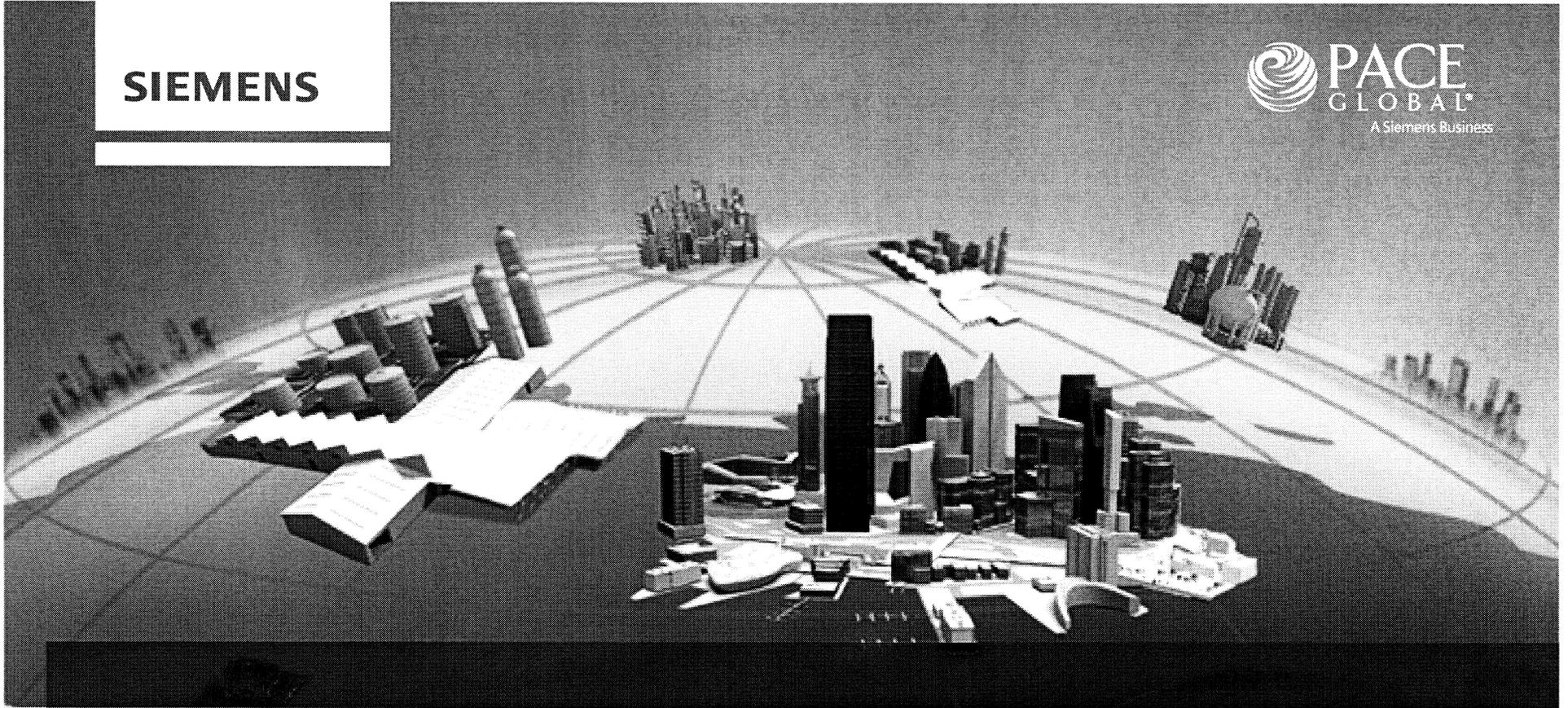


Conditions	Short Term 2013-2015	Mid Term 2016-2025	Long Term 2026-2035
<b>Key Drivers</b>	<ul style="list-style-type: none"> <li>➤ Weak economic recovery places focus on cheap energy</li> </ul>	<ul style="list-style-type: none"> <li>➤ Weak economic recovery</li> <li>➤ Free trade policies dominate</li> </ul>	<ul style="list-style-type: none"> <li>➤ Moderate economic growth</li> </ul>
<b>Key Energy Policy Components</b>	<ul style="list-style-type: none"> <li>➤ No new regulations other than MATS</li> </ul>	<ul style="list-style-type: none"> <li>➤ Limited support for renewable energy and emissions regulations</li> </ul>	<ul style="list-style-type: none"> <li>➤ Growing but limited environmental policy focus</li> </ul>
<b>Fuel and Emission Prices</b>	<ul style="list-style-type: none"> <li>➤ No CO2 regime</li> <li>➤ Low fuel prices (gas below \$4/MMBtu)</li> </ul>	<ul style="list-style-type: none"> <li>➤ No CO2 regime</li> <li>➤ Gas prices remain low (\$4-5/MMBtu) as LNG exports begin</li> <li>➤ Coal prices begin to rise due to increased demand and exports</li> </ul>	<ul style="list-style-type: none"> <li>➤ CO2 price introduced (\$10/tonne)</li> <li>➤ Gas price increases to \$6/MMBtu as demand grows</li> <li>➤ Demand for eastern coals declines while PRB demand remains strong</li> </ul>
<b>Power Generation Impacts</b>	<ul style="list-style-type: none"> <li>➤ Low load growth driven by weak economic growth</li> <li>➤ Low power prices</li> <li>➤ Announced coal retirements</li> </ul>	<ul style="list-style-type: none"> <li>➤ Electricity demand grows with no focus on efficiency measures</li> <li>➤ Limited coal retirements</li> </ul>	<ul style="list-style-type: none"> <li>➤ Electricity demand continues to grow rapidly</li> <li>➤ Slight increase in coal retirements as concern for environment grows</li> </ul>

# High Gas & Carbon Scenario – U.S. Macroeconomic and Policy Conditions



Conditions	Short Term 2013-2015	Mid Term 2016-2025	Long Term 2026-2035
Key Drivers	<ul style="list-style-type: none"> <li>➤ Strong economic and political conditions ripe for environmental regulations</li> </ul>	<ul style="list-style-type: none"> <li>➤ Economic conditions strong</li> </ul>	<ul style="list-style-type: none"> <li>➤ OECD economic growth declines</li> </ul>
Key Energy Policy Components	<ul style="list-style-type: none"> <li>➤ Strong support for stringent environmental regulation</li> <li>➤ Strong anti-fossil fuel orientation</li> </ul>	<ul style="list-style-type: none"> <li>➤ OECD largely agrees to common 80% by 2050 carbon target</li> </ul>	<ul style="list-style-type: none"> <li>➤ OECD carbon goals moderated, 50% by 2050 carbon target</li> </ul>
Fuel and Emission Prices	<ul style="list-style-type: none"> <li>➤ Federal CO2 policy passed</li> <li>➤ Increased gas demand results in higher gas prices</li> <li>➤ Reduced demand for coal</li> </ul>	<ul style="list-style-type: none"> <li>➤ Federal carbon policy starts in 2018 (~\$35/tonne by 2025)</li> <li>➤ Increasing gas prices (at times reaching \$10/MMBtu)</li> <li>➤ Declining coal use domestically, exports continue</li> </ul>	<ul style="list-style-type: none"> <li>➤ CO2 prices reach \$55/tonne</li> <li>➤ Gas prices moderate to \$7-8/MMBtu level</li> <li>➤ Significant coal demand decrease</li> </ul>
Power Generation Impacts	<ul style="list-style-type: none"> <li>➤ Economic recovery leads to strong power demand growth</li> <li>➤ Environmental policies to drive massive coal retirements</li> </ul>	<ul style="list-style-type: none"> <li>➤ Efficiency policies and load reduction measures result in declining load</li> <li>➤ Coal retirements reach 140 GW (cumulative) by 2025</li> </ul>	<ul style="list-style-type: none"> <li>➤ Load growth continues to be negative</li> <li>➤ Coal retirements reach 170 GW (cumulative)</li> </ul>



# Appendix: Retirement List

# 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.

# Low Gas & Carbon 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
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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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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
WN 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.