



California Energy Commission

North American Market Gas-Trade (NAMGas) Model: Scenarios Addressing Gas Issues Uncertainties

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- **California Policy Case:** Six assumptions that pose major impacts on California gas markets:
 - Begins with the Low Price/High Demand Common Case. Plus, these five assumptions are also included:
 - California meets 33% RPS by 2020; other WECC states delay meeting their RPS three years
 - NGVs meet the most optimistic policy goals
 - All energy efficiency goals achieved as outlined in the Energy Commission's *California Energy Demand Forecast 2012-2022*
 - Monterey Shale fully developed in seven years



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- **California Policy Case (continued):**
 - New carbon credit price response curves
- All other factors assume the same values as in the Low Price/High Demand Common Case:
 - P10 cost environment; i.e., 90% chance that natural gas production costs will fall below 160% of year 2000 costs.
 - LNG exports
 - Added hydrofracking O&M costs for water use and disposal
 - Coal-fired generation conversion
 - Technology improvement rate
 - GDP/economic growth
 - GHG/cap & trade



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- **Natural Gas/Electric Case:** Impact on gas markets of larger renewables share and larger conversion of coal to gas in electric sector.
 - Begins with the Reference Case, and adds these assumptions:
 - California meets 40% RPS by 2020; all other WECC states meet their RPS on time
 - 80 GW of U.S. coal-fired electric generation converted to natural gas
 - All other factors are the same as in the Low Price/High Demand Common Case:
 - P50 cost environment; i.e., equal chance that natural gas production costs will fall above or below 105% of year 2000 costs.



- **Natural Gas/Electric Case (continued):**
 - Natural gas vehicles
 - Energy efficiency
 - North American recoverable natural gas reserves base
 - LNG exports
 - Added operations and maintenance costs for water use and disposal
 - Technology improvement rate
 - GDP/Economic growth
 - GHG/Cap & trade



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- **Low Innovation Case:** Models the impact of assumptions that restrict U.S. gas supply.
 - Begins with the Reference Case, and adds these assumptions:
 - North American recoverable natural gas reserves base shrinks by 7.5% to 12.5%
 - High Price/Low Demand Common Case operations and maintenance cost assumptions for water use and disposal
 - Technology improvement rate 0.5% (half the Reference Case value)



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- **Low Innovation Case (continued):**
 - All other assumptions are the same as in the Reference Case:
 - P50 cost environment; i.e., equal chance that natural gas production costs will fall above or below 105% of year 2000 costs.
 - RPS compliance
 - Natural gas vehicles
 - Energy efficiency
 - LNG exports
 - Coal-fired generation conversion
 - GDP/Economic growth
 - GHG/Cap & trade



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Questions and Comments