



California Energy Commission

North American Market Gas-Trade (NAMGas) Model: Updated Common Cases

**Natural Gas Unit Workshop
2013 Integrated Energy Policy Report
California Energy Commission**

April 24, 2013

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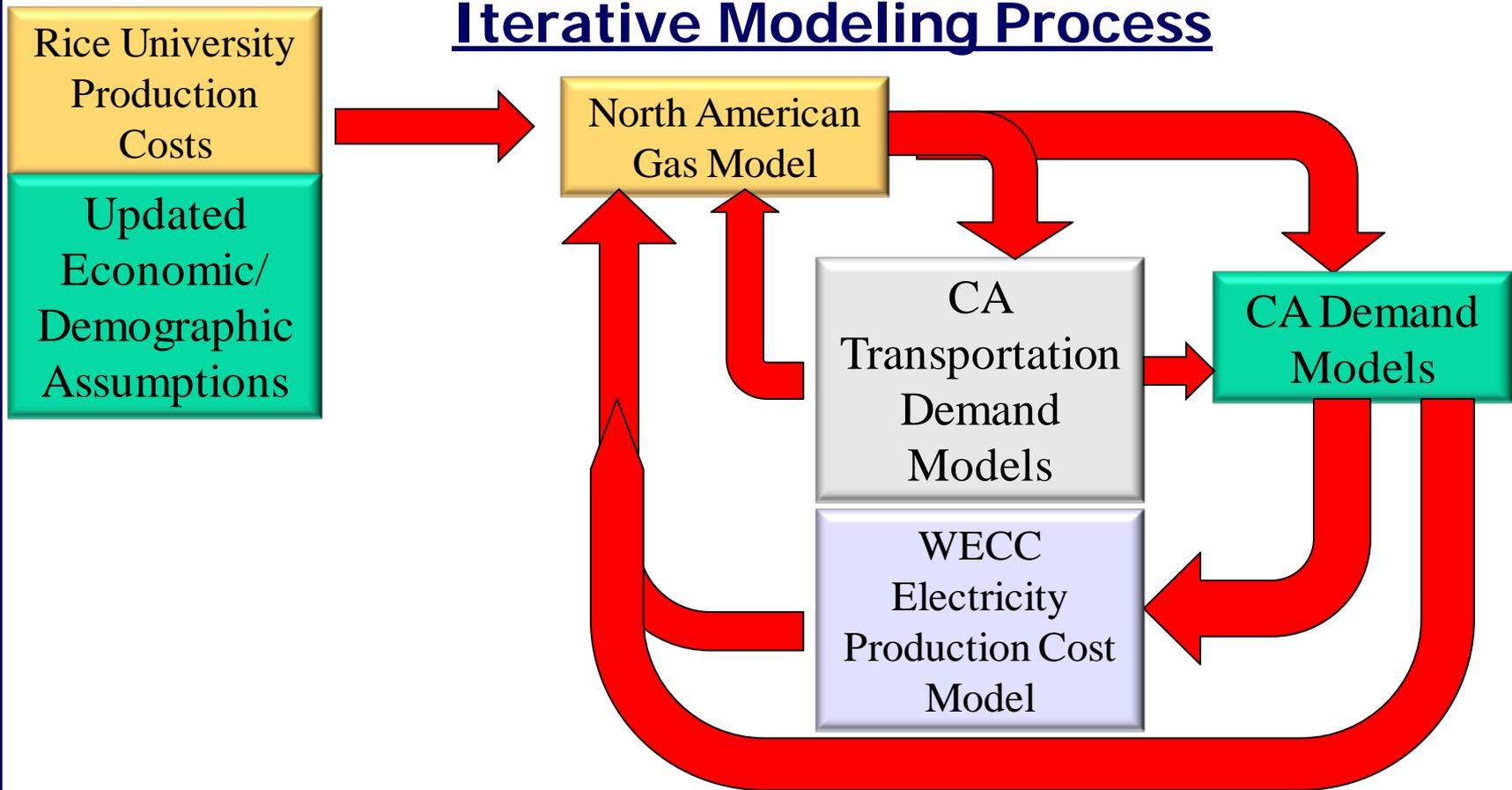
Work Continuing with Cases

- **February 19th IEPR Workshop**
 - **NAMGas Model – Leon Brathwaite**
 - **Iterative Modeling Process – Ivin Rhyne**
 - **Stakeholders' comments and suggestions**



Work Continuing with Cases (cont.)

Iterative Modeling Process





Reference Case: Changes Made from February 19th Assumptions

- **Coal Fired Generation Retirement:**
 - 30 GW starting in 2014 => 61 GW starting in 2014
 - The Brattle Group - October, 2012
- **Renewable Portfolio Standard:**
 - California meets RPS on time, 5 year delay for other states => California and rest of WECC states meet RPS on time, 5 year delay elsewhere
- **Updated Infrastructure Capacity Addition to Export Natural Gas to Mexico**
- **Added Structure to Improve Performance of the LNG Sector**
 - Conversion from WGTM to NAMGas



High Price/Low Demand Case: Changes Made from February 19th Assumptions

- **Cost Environment:**
 - P50 Line => P10 Line
- **Updated Infrastructure Capacity Addition to Export Natural Gas to Mexico**
- **Added Structure to Improve Performance of the LNG Sector**
 - Conversion from WGTM to NAMGas



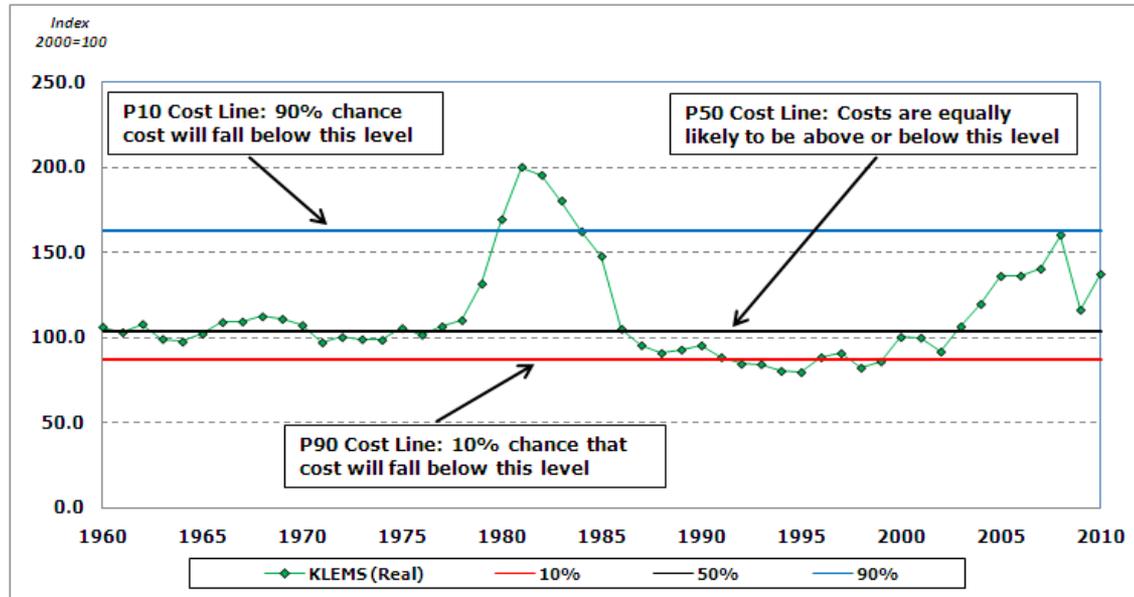
Low Price/High Demand Case: Changes Made from February 19th Assumptions

- **Cost Environment:**
 - P50 Line => P90 Line
- **Coal Fired Generation Retirement:**
 - 1 GW starting in 2014 => 31 GW starting in 2014
 - The Brattle Group - October, 2012
- **Updated Infrastructure Capacity Addition to Export Natural Gas to Mexico**
- **Added Structure to Improve Performance of the LNG Sector**
 - Conversion from WGTM to NAMGas



North American Market Gas Trade Model: Developing a Cost Environment

Typical Cost Environment (P50): 1975, 1986, and 2003



- Staff must simulate the cost environment for analysis:
 - Graph shows indexed cost between 1960 and 2010
 - High cost environment ~ 1979 – 1984
 - Low cost environment ~ 1992 – 2000.



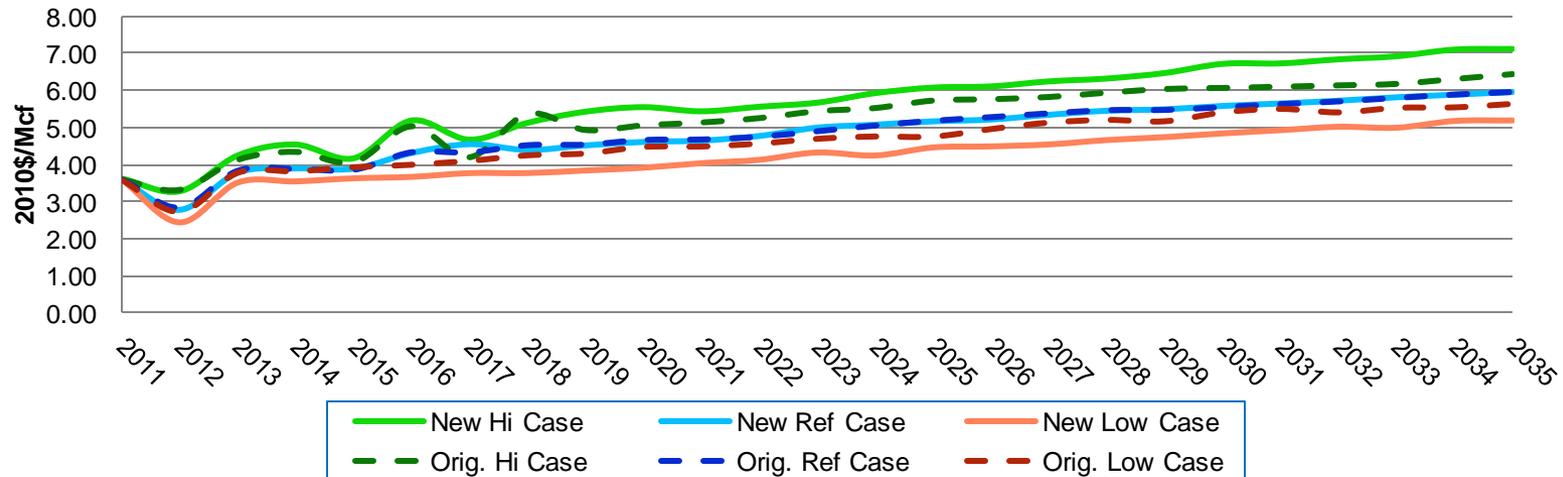
Common Cases: Supply Balance

**Performance of Cases:
Lower 48**



Common Cases: Price Performance of Cases (Henry Hub)

Henry Hub Prices

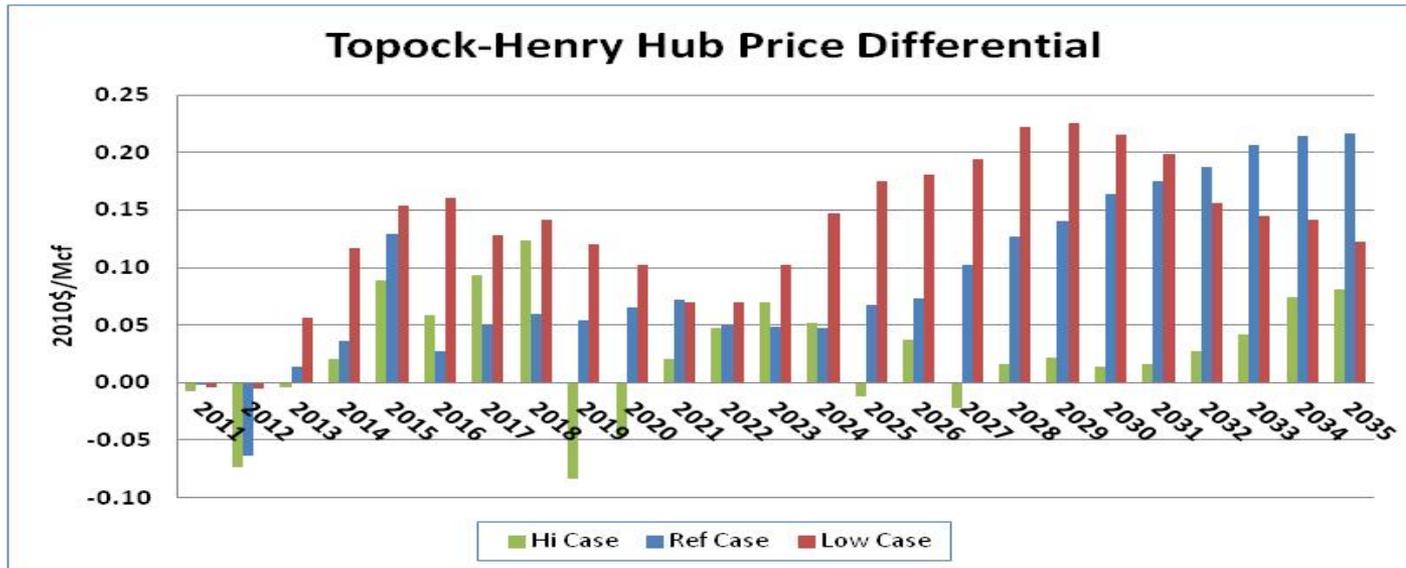


- In general, prices behave as expected:
 - High Price case produced highest prices
 - Low price case produced lowest prices
- Adjusted cases have created a larger “zone of uncertainty”



National Cases: Price Performance of Cases (Differentials)

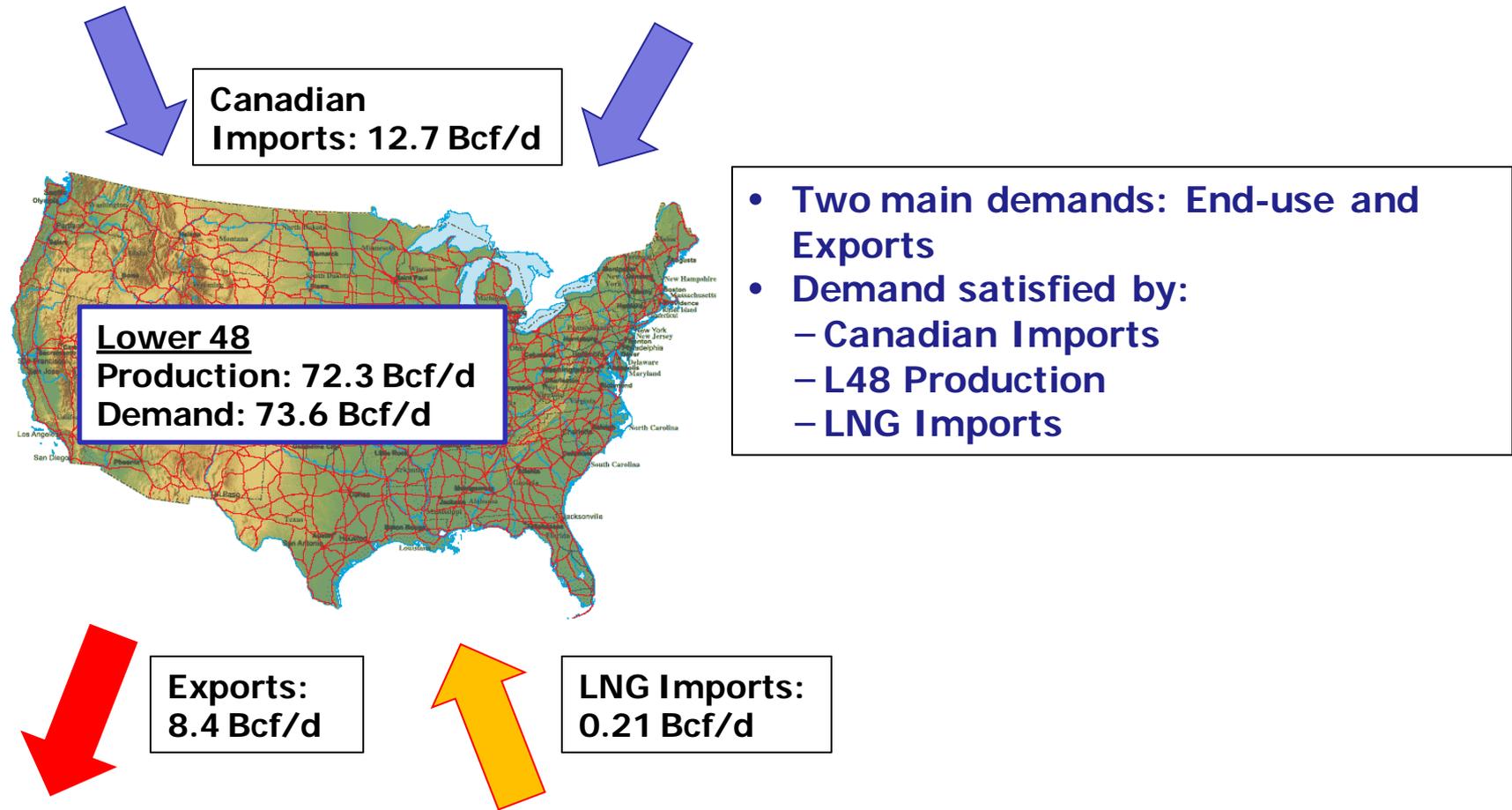
Topock - Henry Hub



- In general, differentials turn positive after 2013:
 - Resource abundance more evident in the eastern US
 - Access to shale and 'tight' gas resources is re-ordering the supply portfolio, impacting eastern prices more than western.

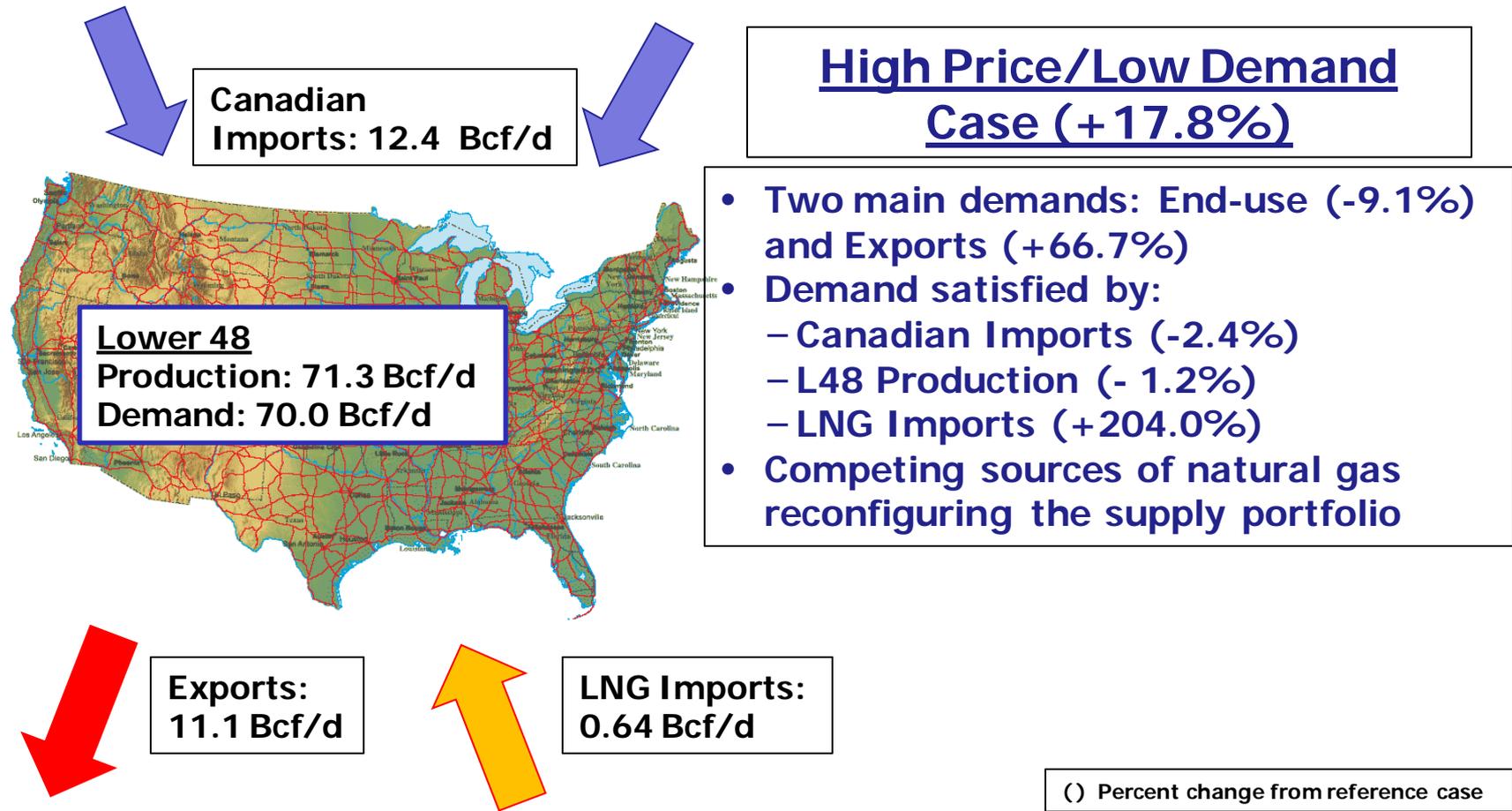


Common Scenarios Cases: Supply Portfolio of Reference Case (2025)



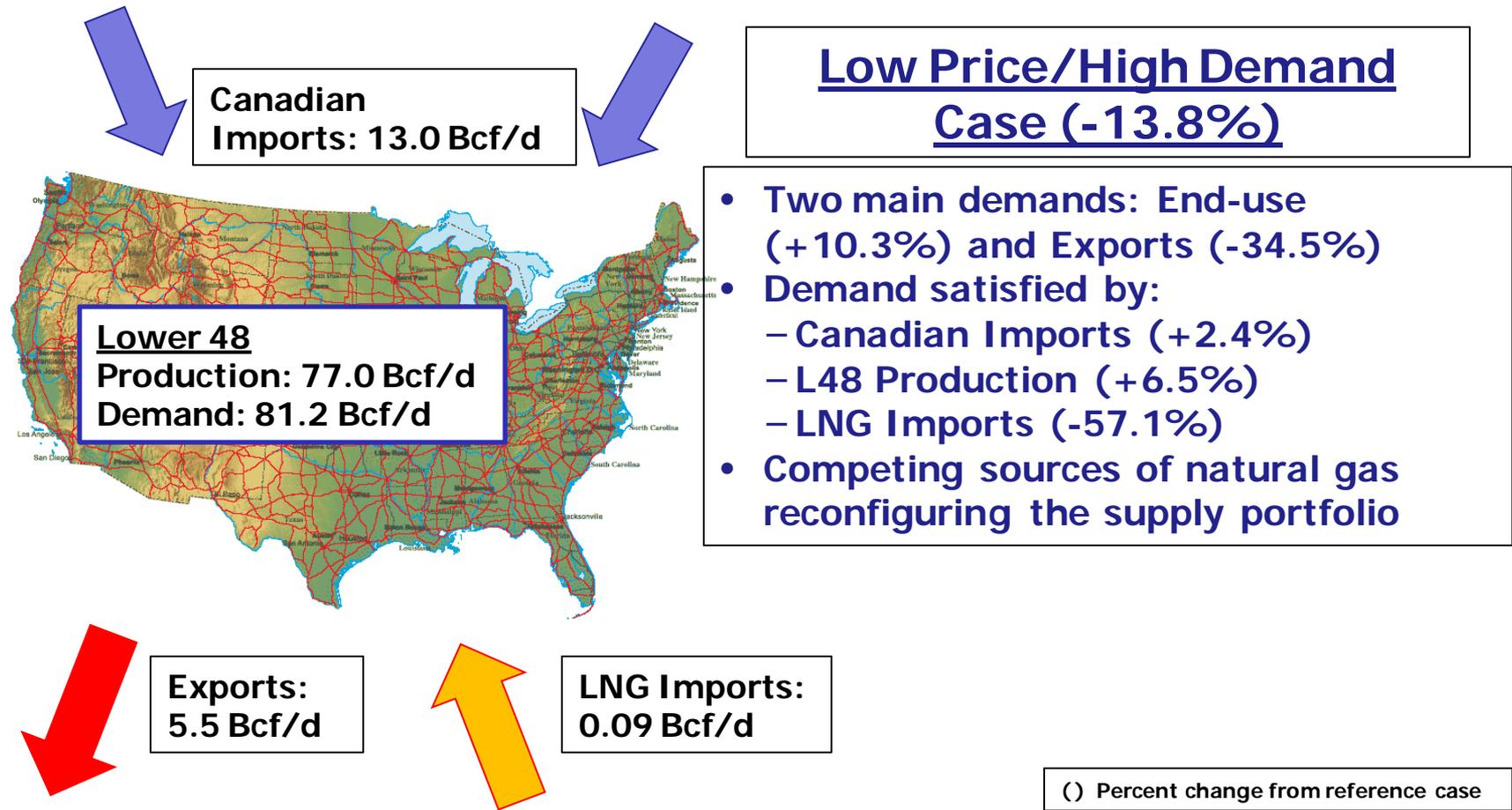


Common Scenarios: Reconfiguration of Supply Portfolio (2025)





Common Cases: Reconfiguration of Supply Portfolio (2025)



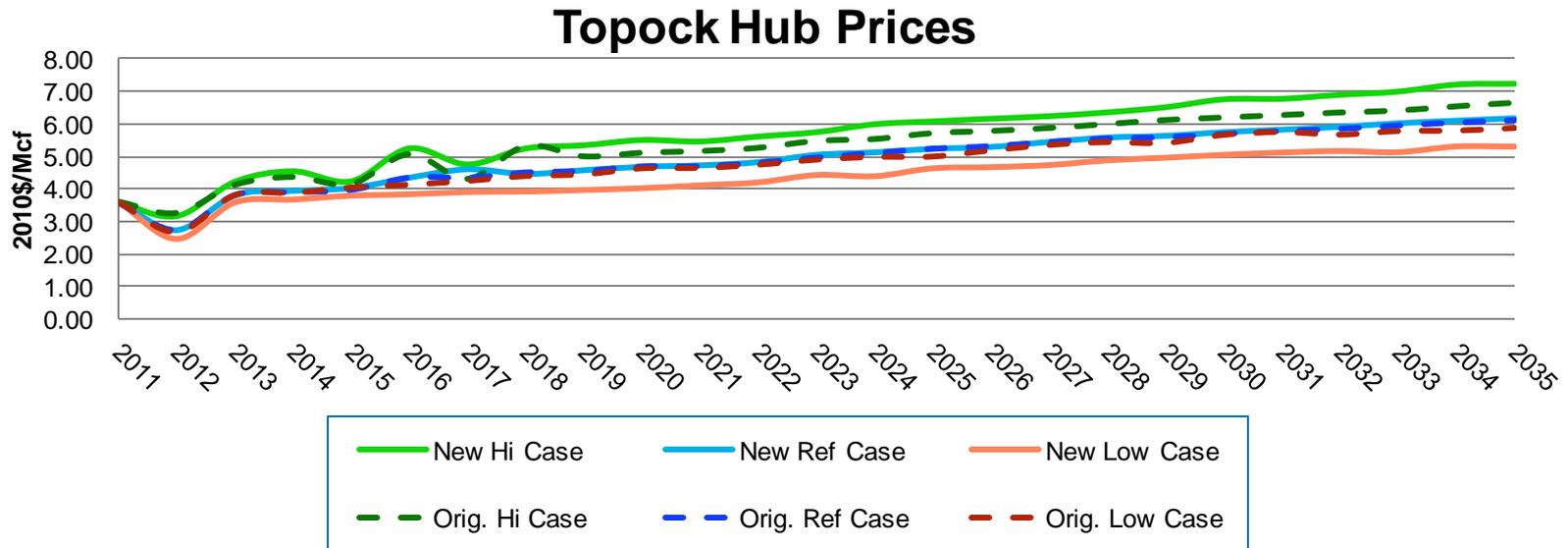


Common Cases: Supply Balance

Performance of Cases: California



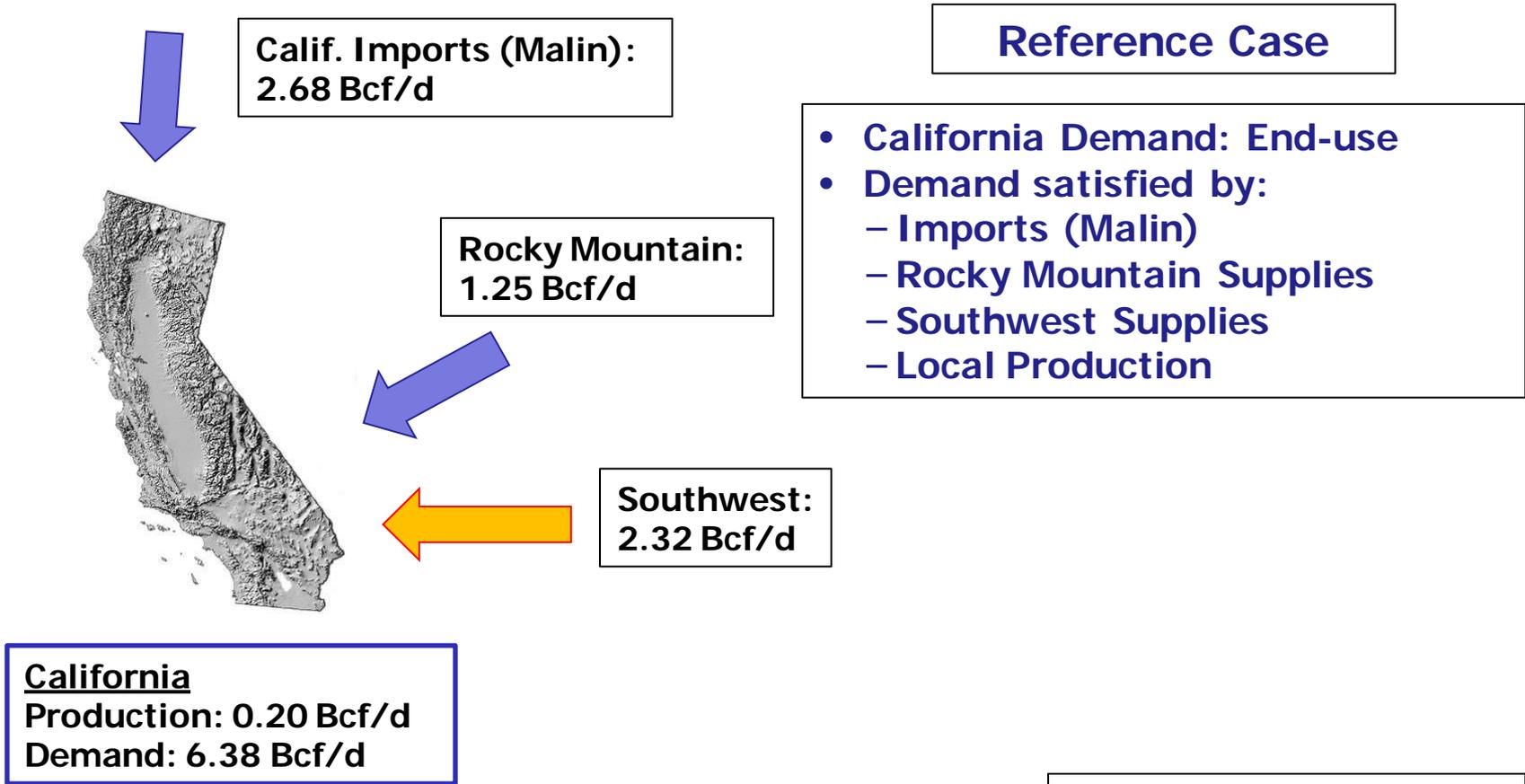
Common Cases: Price Performance of Cases (Topock Hub)



- **In general, prices behave as expected:**
 - High Price case produced highest prices
 - Low price case produced lowest prices
- **The adjusted cases creates a larger “zone of uncertainty” for California.**



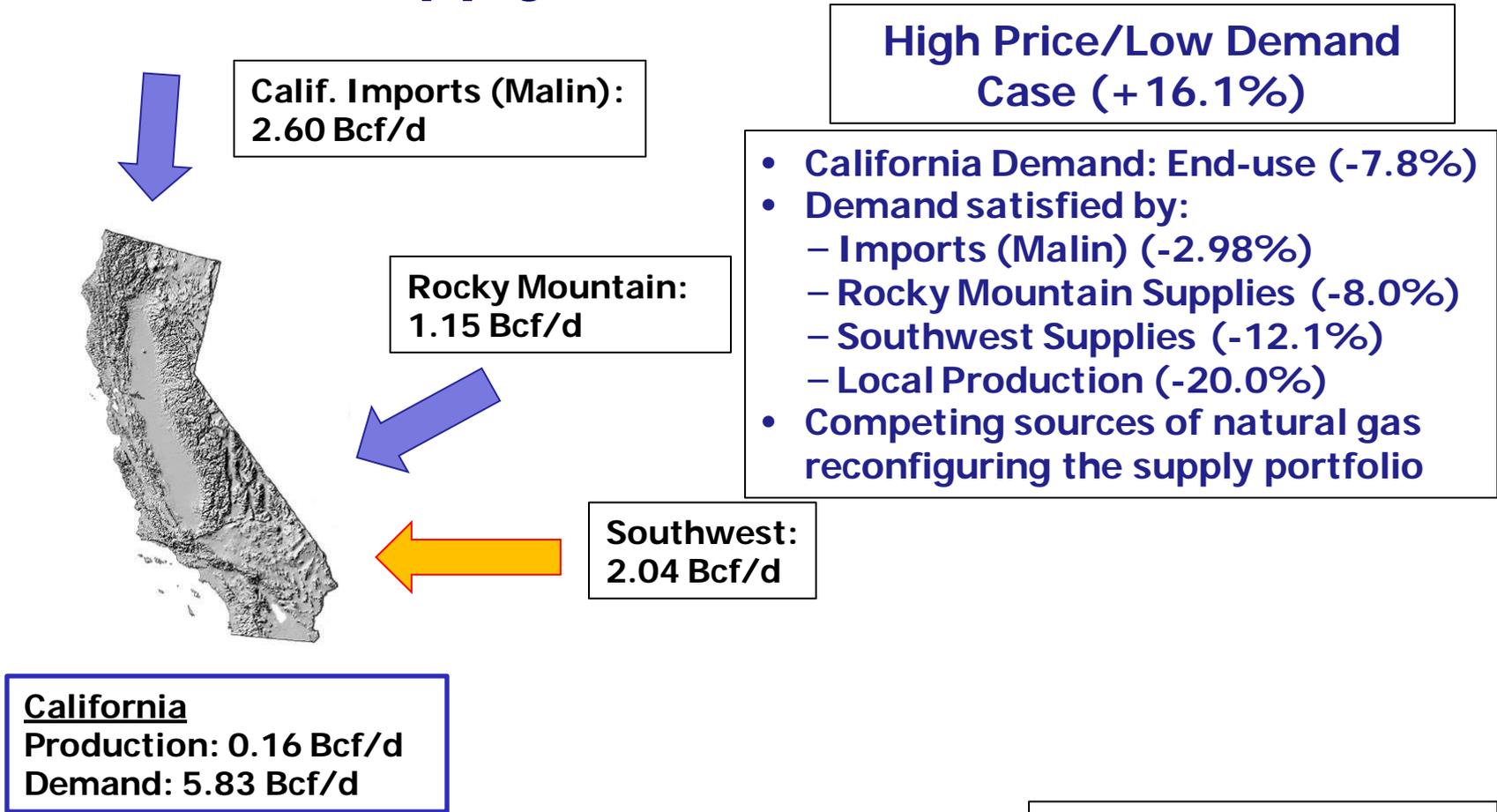
Common Cases: California Supply Portfolio (2025)



() Percent change from reference case



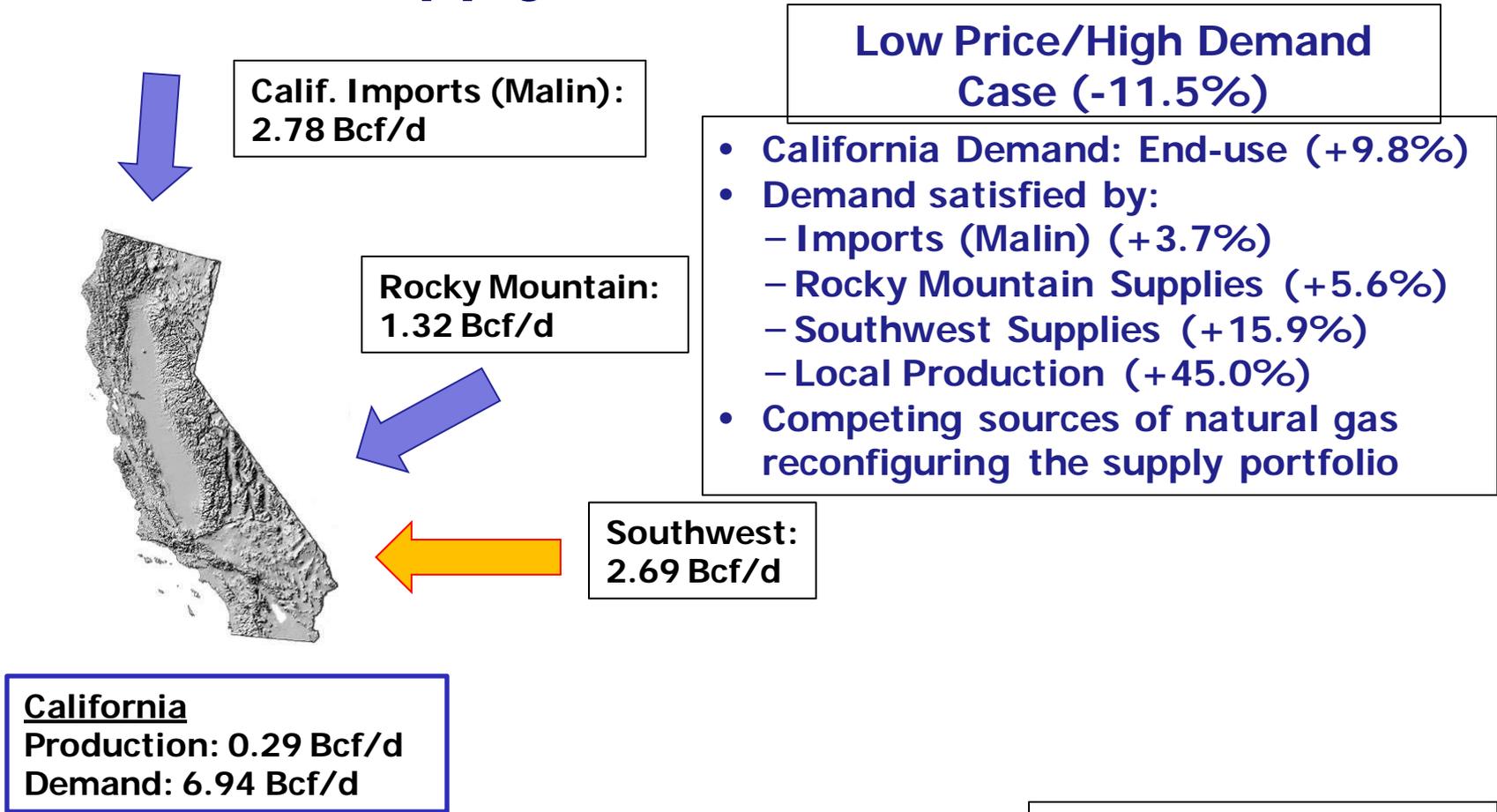
Common Cases: California Supply Portfolio (2025)



() Percent change from reference case



Common Cases: California Supply Portfolio (2025)



() Percent change from reference case



Summary:

- **Work Ongoing with Cases**
- **Modeling Iterative Process still ongoing**
- **More Stakeholders suggestions and comments possible**
- **Larger Zone of Uncertainty**