



# **Analysis of California Natural Gas Market, Supply Infrastructure, Regulatory Implications, and Future Market Conditions**

**CIEE Subcontract No. MNG-07-01**

**Natural Gas Storage Forum:  
Natural Gas Storage Challenges, Opportunities and  
Future Options**

**November 15, 2007**

## Summary Observations

- Infrastructure requirements in 2015:
  - Baseline demand - Sufficient infrastructure to meet California demand
  - High demand – Sufficient infrastructure to meet California demand
- Infrastructure requirements in 2020:
  - Baseline demand - Sufficient infrastructure to meet California demand
  - High demand – Additional supply over 50-200 Bcf will be needed to meet California demand
- The analysis of pipeline send-out data indicates that there was sufficient pipeline and storage capacity to meet California demand in the past three years
- Pipeline and storage are primarily expected to provide the additional infrastructure needed to meet high demand
  - LNG could be an option if reliability of supply is established

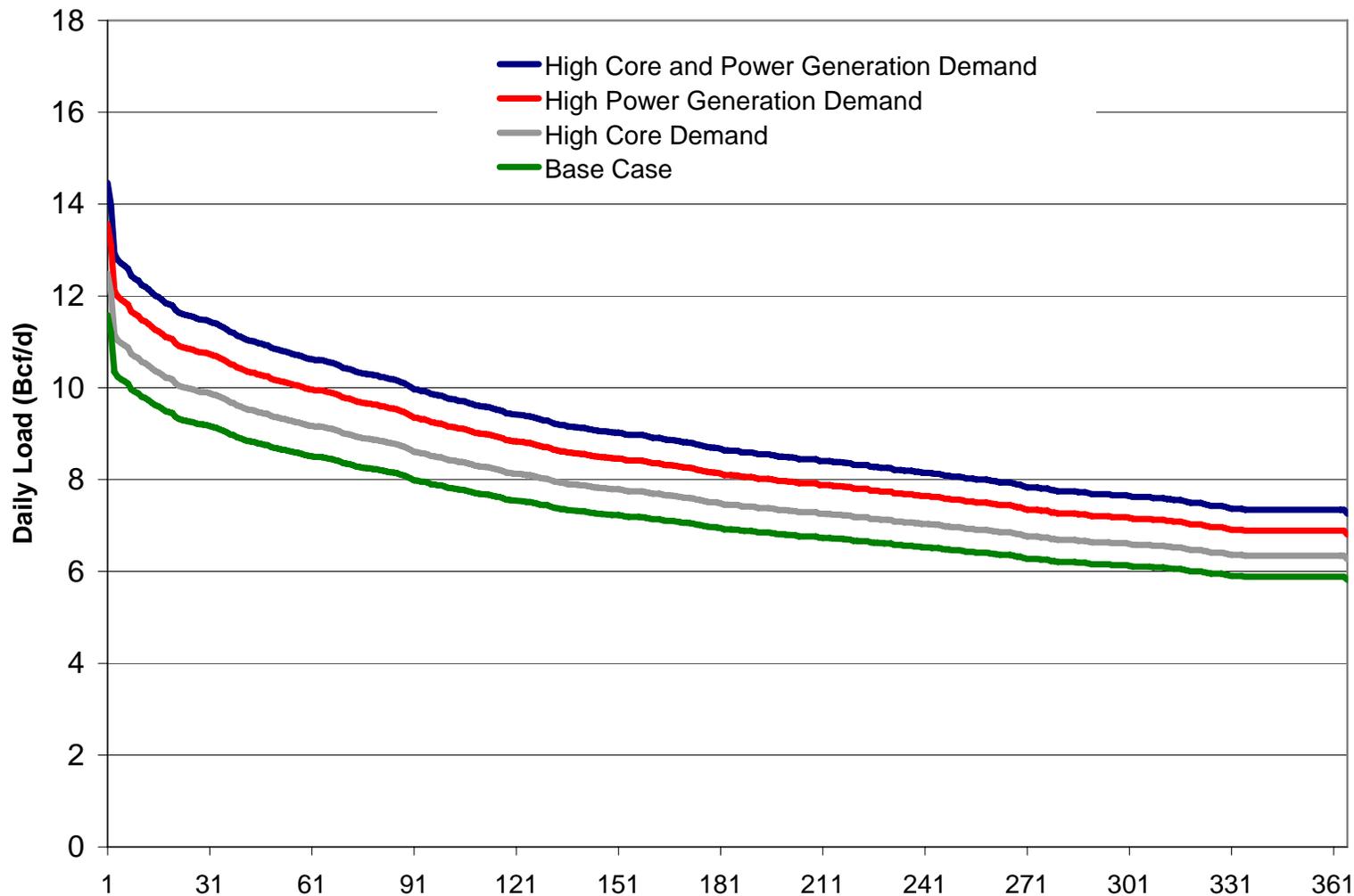
## Summary Observations

- In-state storage offers the most economical source of storage service for California
- Out-of-state storage from the Southwest offers the next best alternative for California to supplement in-state storage
- Fundamentals supporting storage are strong – expectation of increased volatility, sustained seasonal basis
- Regulatory requirements for storage development in California are comparable to those at other locations in the United States

## Methodology Overview – Estimating the Need for Additional Natural Gas Supply Infrastructure

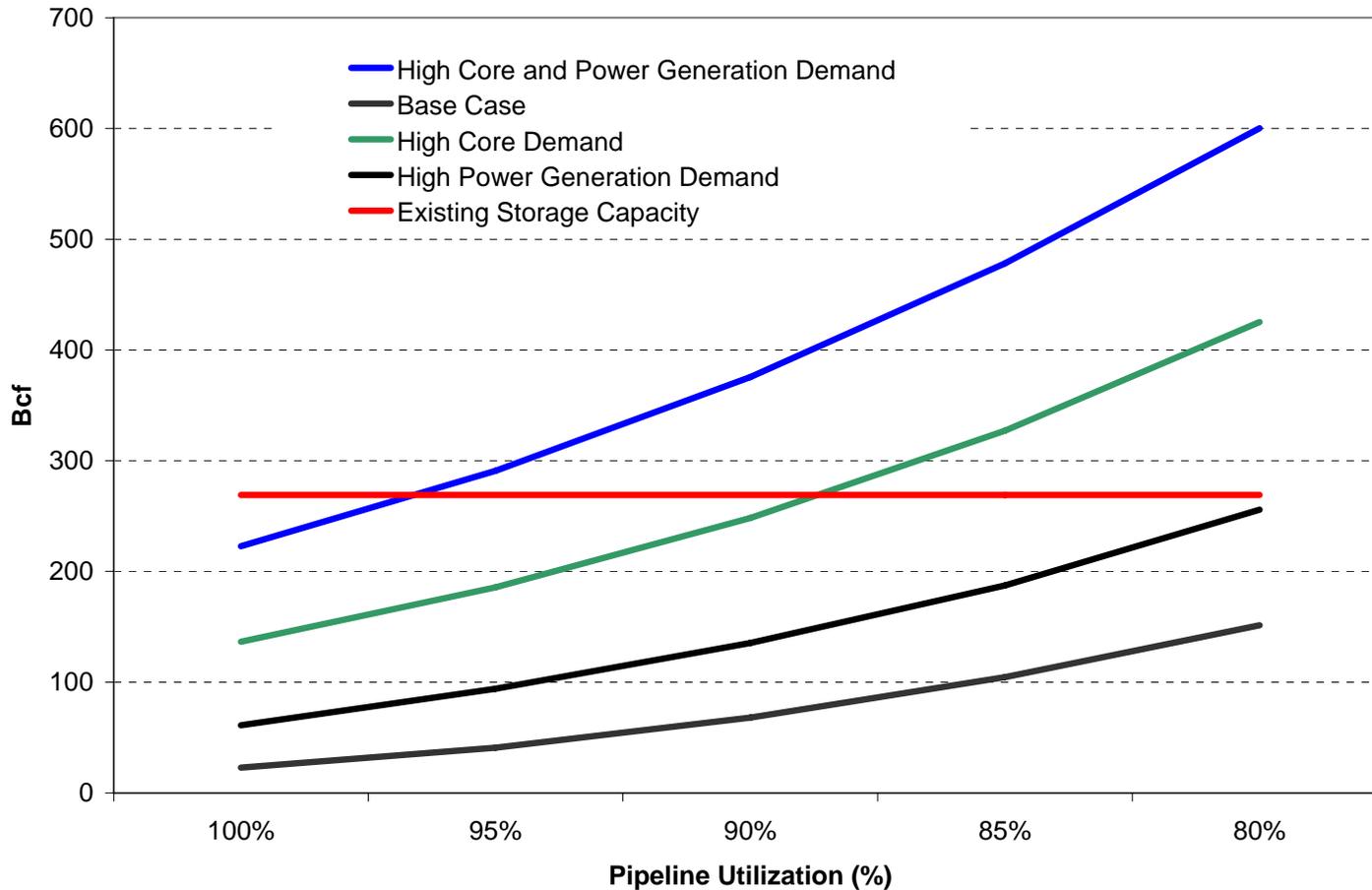
- Fundamental analysis illustrates the market balance of average monthly demand and supply. This is equivalent to a long-term, efficient and normal market view.
  - However, the underlying assumption that the daily demand within a month is uniformly distributed could underestimate the true demand needs on a daily basis.
- Daily demand forecasts is a more realistic way to illustrate the needs of California natural gas consumers on a daily basis.
  - Given the low elasticity of demand in California, additional supply infrastructure may be required to meet peak demand days.
- B&V evaluated the sufficiency of existing and expected California supply portfolio on a daily basis and compare the economic cost of assets to meet the demand requirement. Four demand scenarios were considered:
  - Base case
  - High Core Demand Case
  - High Power Demand Case
  - High Core and Power Demand Case

# Projected Scenarios for Daily Load in California - 2015

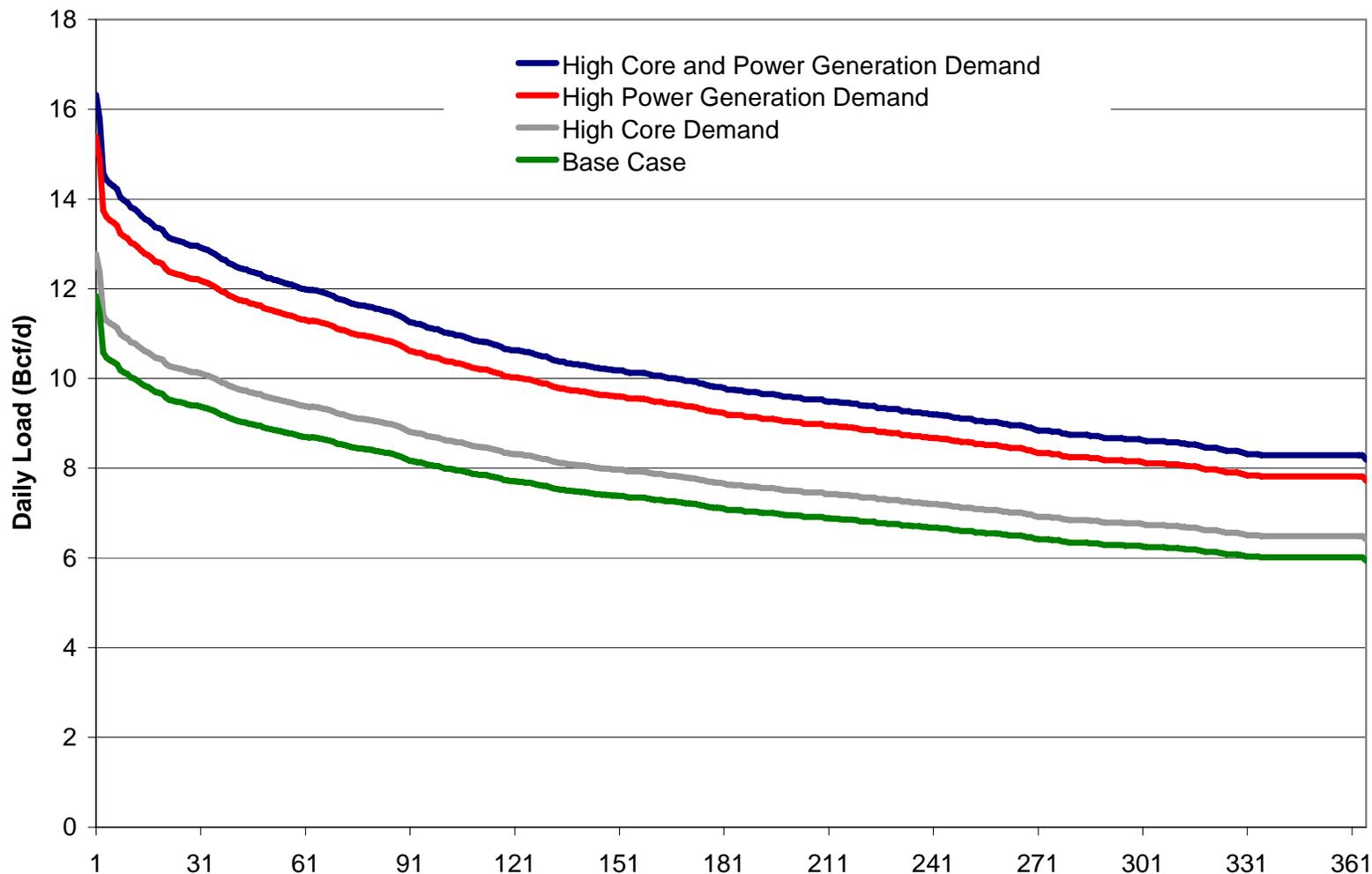


# Estimated Peak Supply Needs under Different Pipeline Capacity Utilization Assumptions 2015

Estimated Peak Supply Needs above Pipeline Receipts and In-State Production vs. Pipeline Utilization Factor 2015

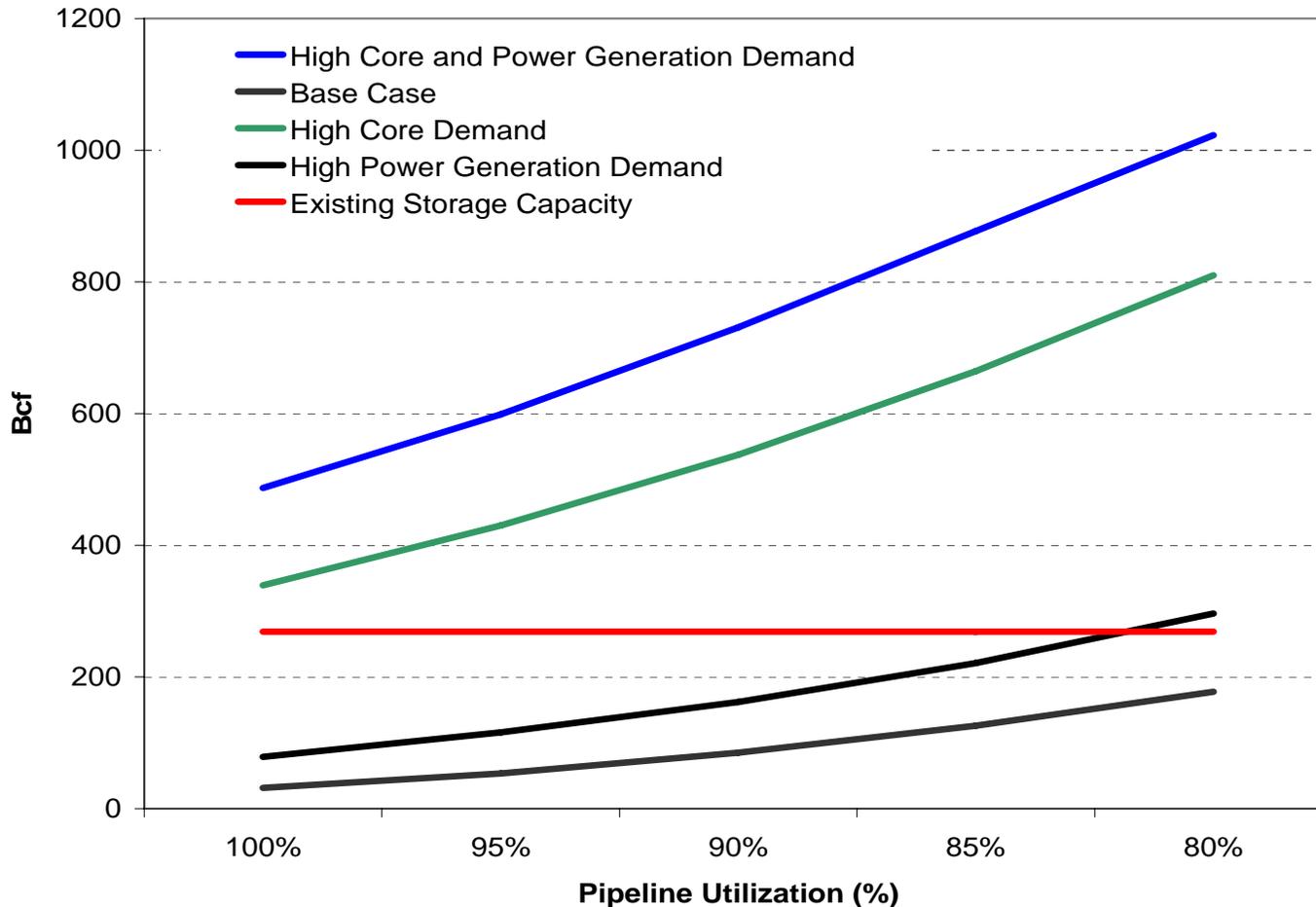


# Projected Scenarios for Daily Load in California - 2020



# Estimated Peak Supply Needs under Different Pipeline Capacity Utilization Assumptions 2020

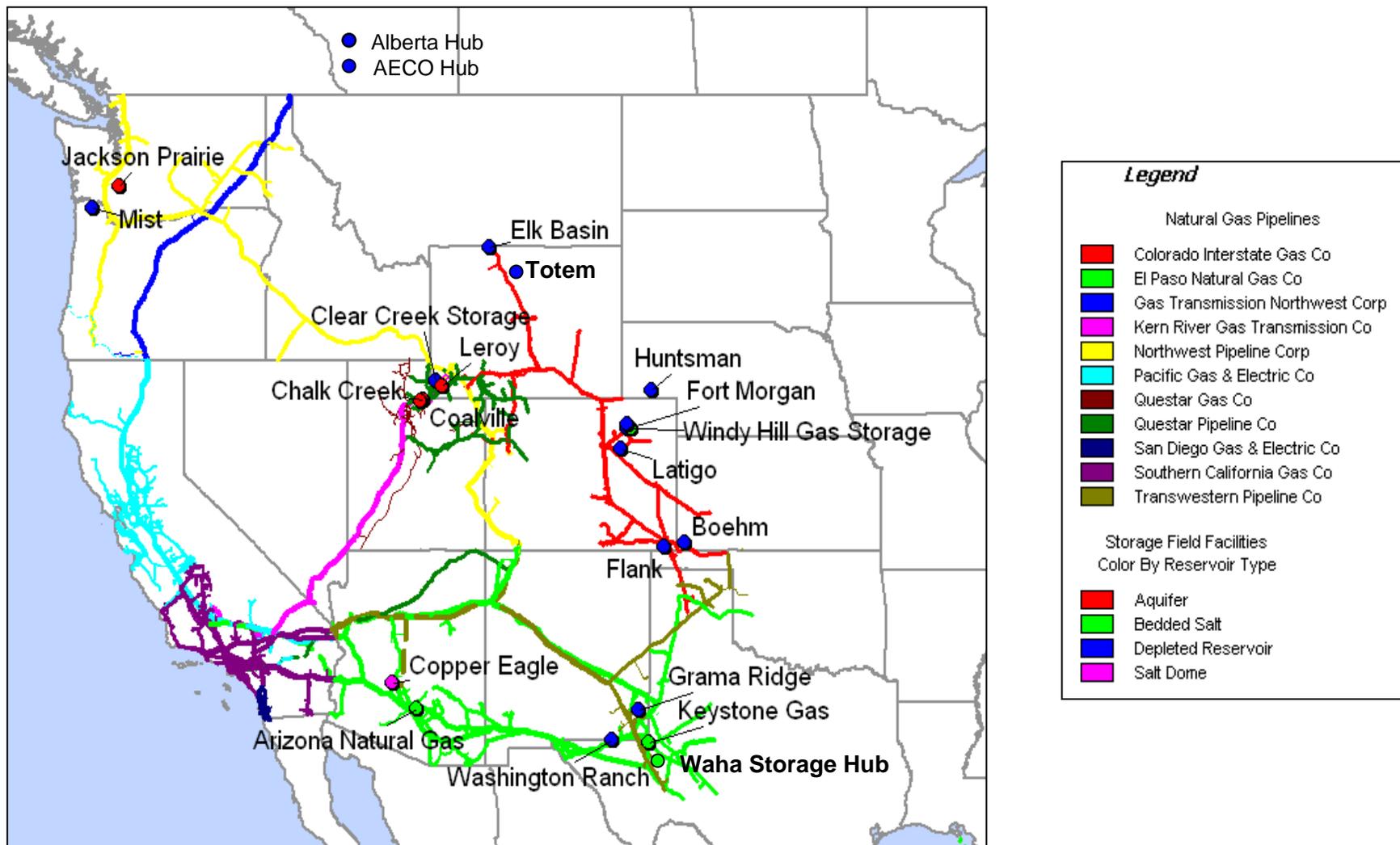
Estimated Peak Supply Needs above Pipeline Receipts and In-State Production vs. Pipeline Utilization Factor 2020



## Methodology Overview – Estimating the Costs of Storage to Meet California Requirements

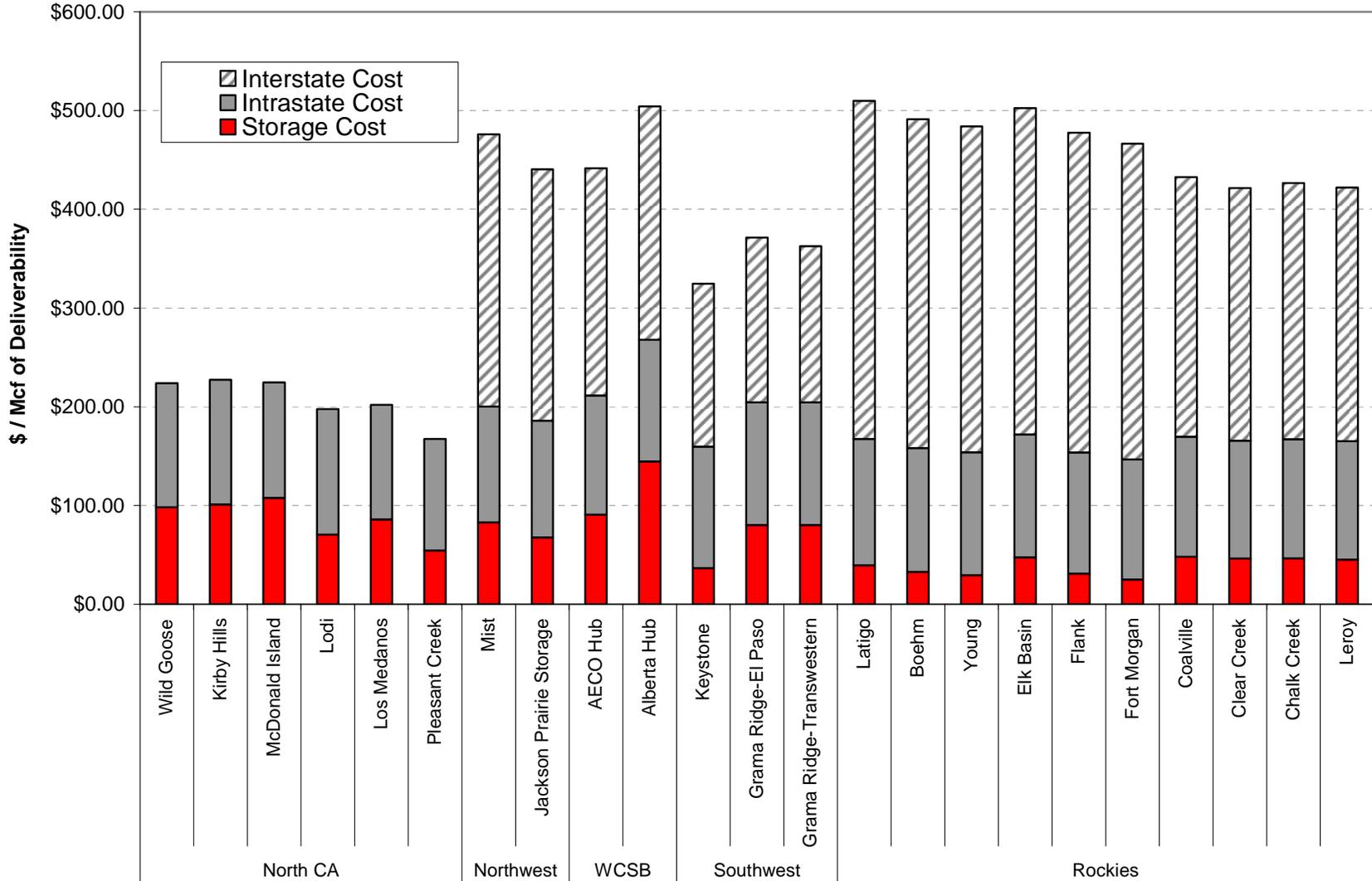
- Out-of-state storage facilities were identified based upon the available pipeline network and potential for serving California
- Total costs of reaching the California wholesale market, including interstate and intrastate transportation costs and storage costs have been included in the analysis
- Storage costs:
  - Costs for market based storage assets were estimated using B&V's real options model, Storage Valuation Advisor
  - Storage tariffs were utilized to estimate costs associated with regulated storage assets
- Transportation costs:
  - Pipeline tariffs were utilized to estimate transportation costs

# Storage facilities were identified based on the available pipeline network and potential for serving California

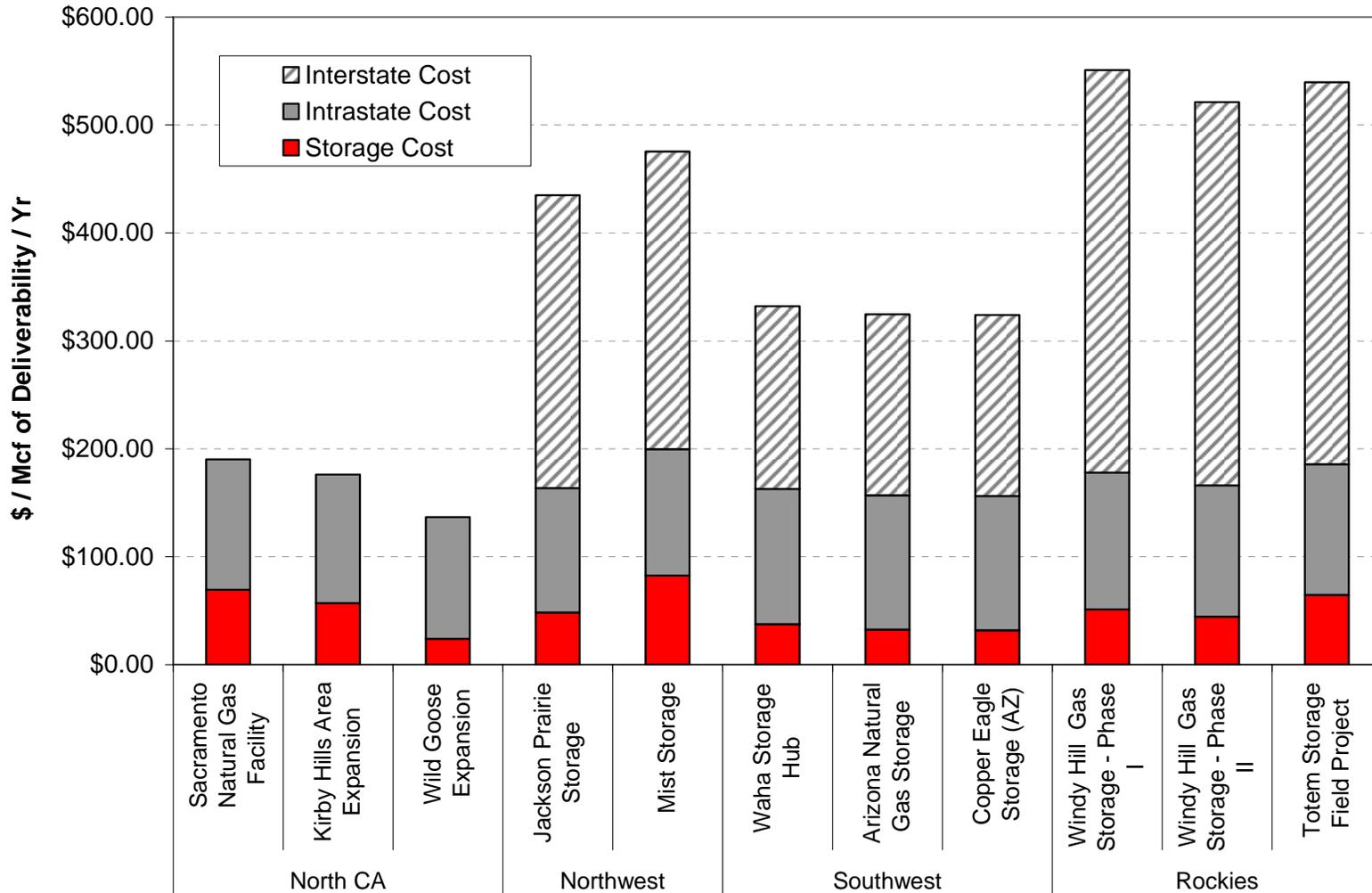


Source: Energy Velocity; B&V Research

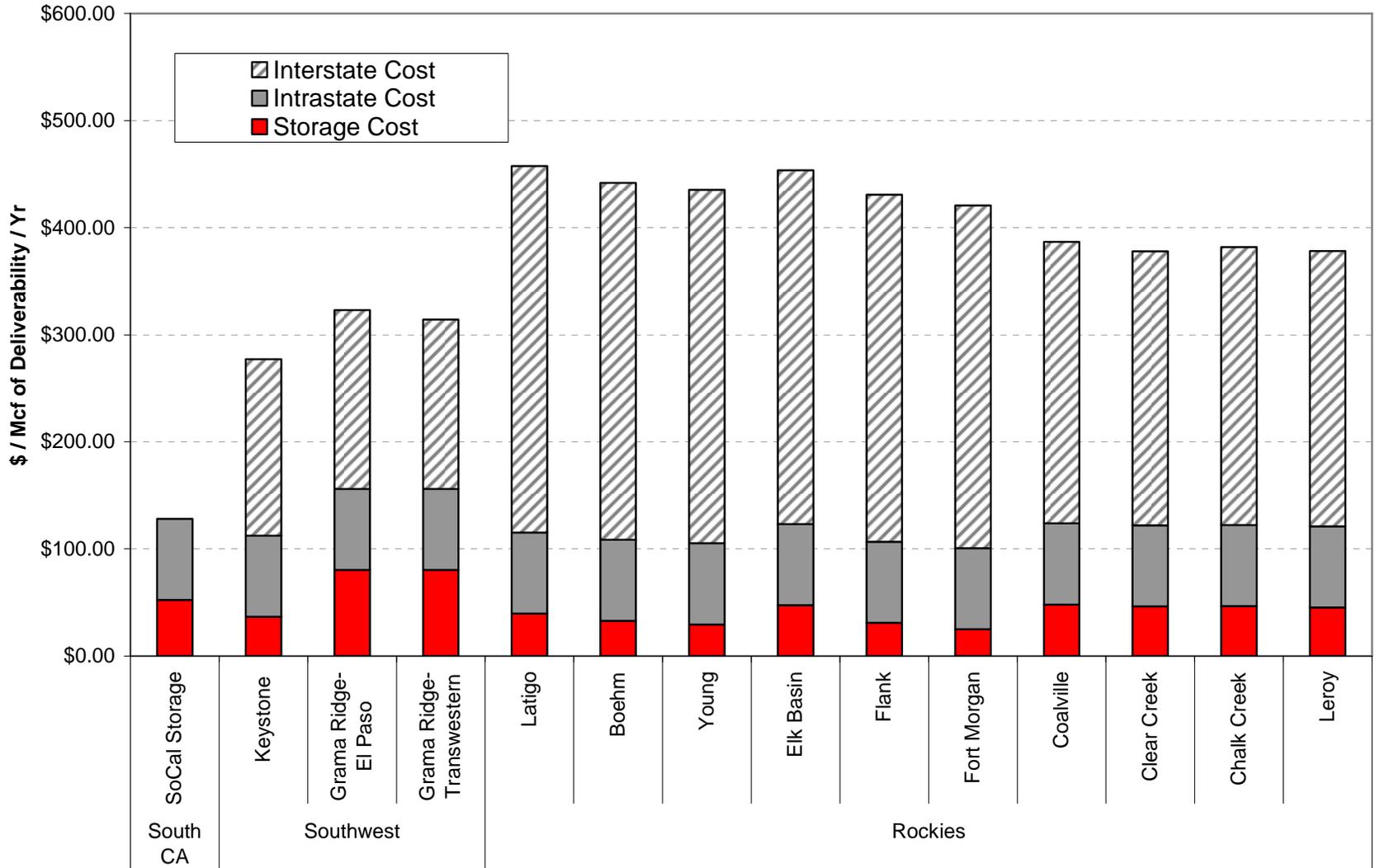
# Existing facilities in its service area offer the most economically viable storage alternative for PG&E



# In-state proposed storage facilities are more attractive than out-of-state facilities for PG&E; Southwest facilities may offer viable alternative



# Existing facilities in its service area offer the most economically viable storage alternative for SoCal



# Proposed Southwest facilities offer the most viable alternative for SoCal's storage needs

