2014-2024 California and WECC Wide Preliminary Natural Gas Use For Electric Generation

Natural Gas Issues, Trends, and Forecast Scenarios Workshop

July 17, 2013

Angela Tanghetti
Electricity Analysis Office
Electricity Supply Analysis Division
angela.tanghetti@energy.ca.gov / 916-654-4854

Scope of Analysis

- Fuel use for electric generation is a major driver of total natural gas demand
- Develop electricity resource plans and demand scenarios based on policy programs
- Production cost model (PLEXOS) simulations to estimate CA & WECC natural gas demand for generation forecasts through 2024
- Includes existing and future power plants, demand and supply profiles throughout the WECC
- **Not** an operating flexibility analysis of potential natural gas need

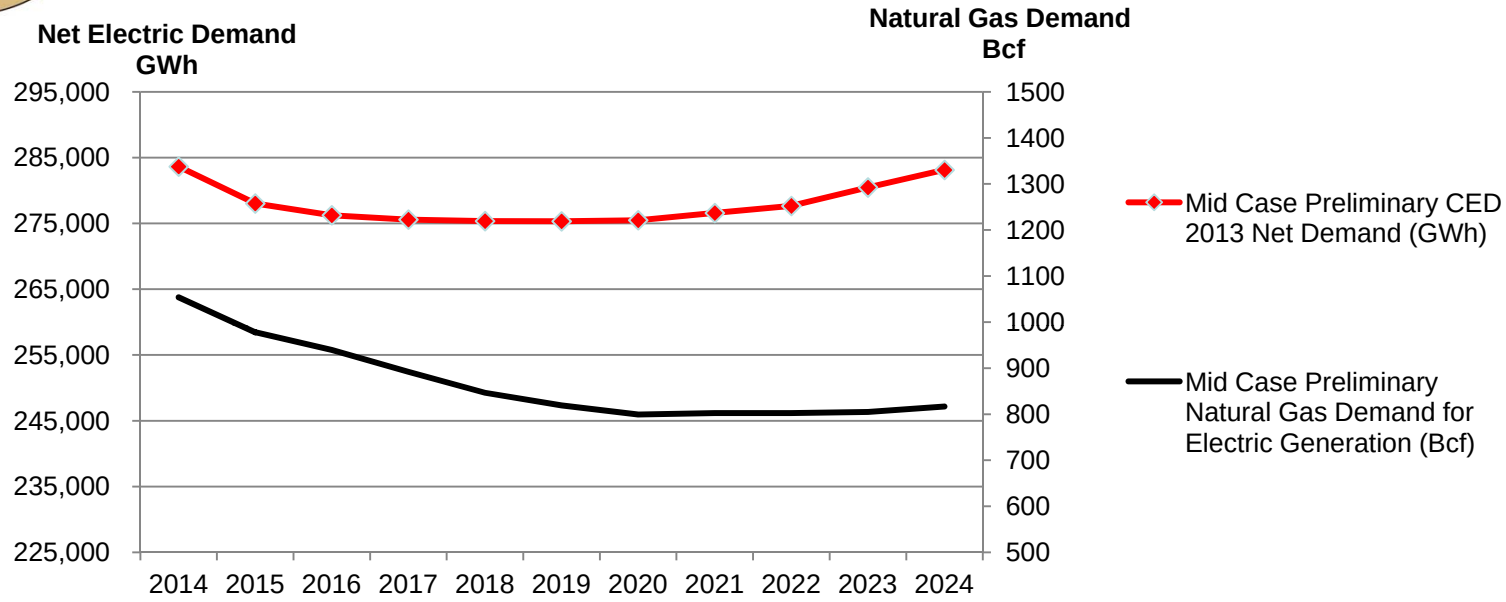
Key Drivers Affecting Simulation Results

- Preliminary demand projections (Preliminary CED 2013 Demand Forms posted June 2013)
- Incremental uncommitted energy efficiency (IUEE) program projections (CED 2011 for IOUs and CED 2009 for POUs)
- Renewable Portfolios based on the joint CEC/CPUC commercial interest portfolio presented December 2012 and adjusted for Preliminary CED 2013 Retail Sales

Key Drivers Affecting Simulation Results

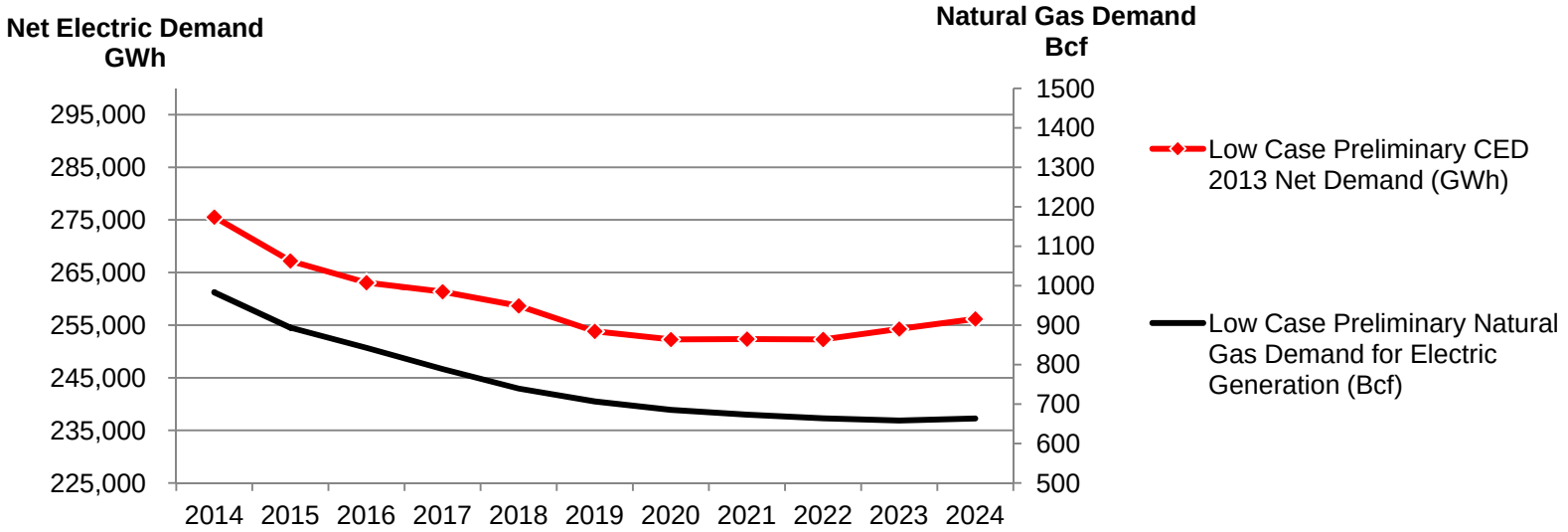
- Combined Heat & Power (CHP) development goals from the ICF Market Assessment Report revised June 2012
- Once-Through Cooling (OTC) plant retirements based on latest SWRCB compliance schedules
- Announced termination of coal generation contracts
- Natural gas generation fleet efficiency improvements

Mid Demand Case - California Electricity Demand and Natural Gas Demand For Electric Generation



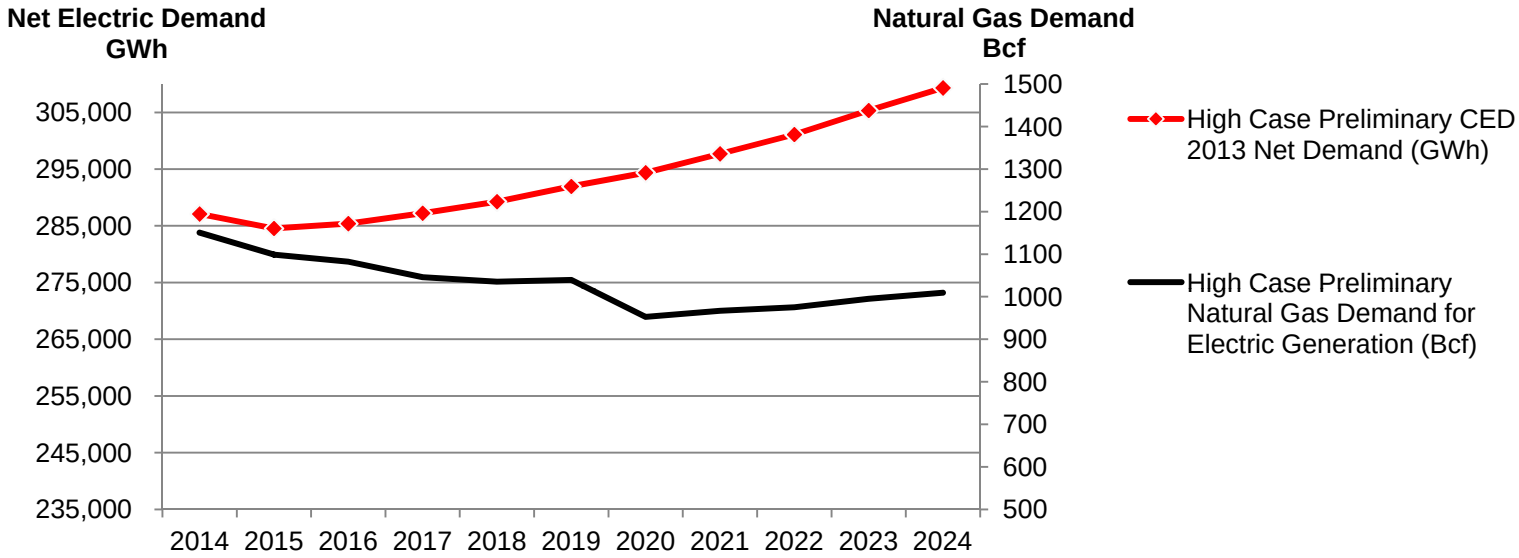
- Mid Case IUEE and new on-site CHP create negative load growth in early part of forecast period
- Larger growth in renewable generation projected earlier in forecast period due to investment tax credit expiration by 2017
- -2.5% average annual (2014-2024) decline in natural gas demand for electric generation

Low Demand Case - California Electricity Demand and Natural Gas Demand For Electric Generation



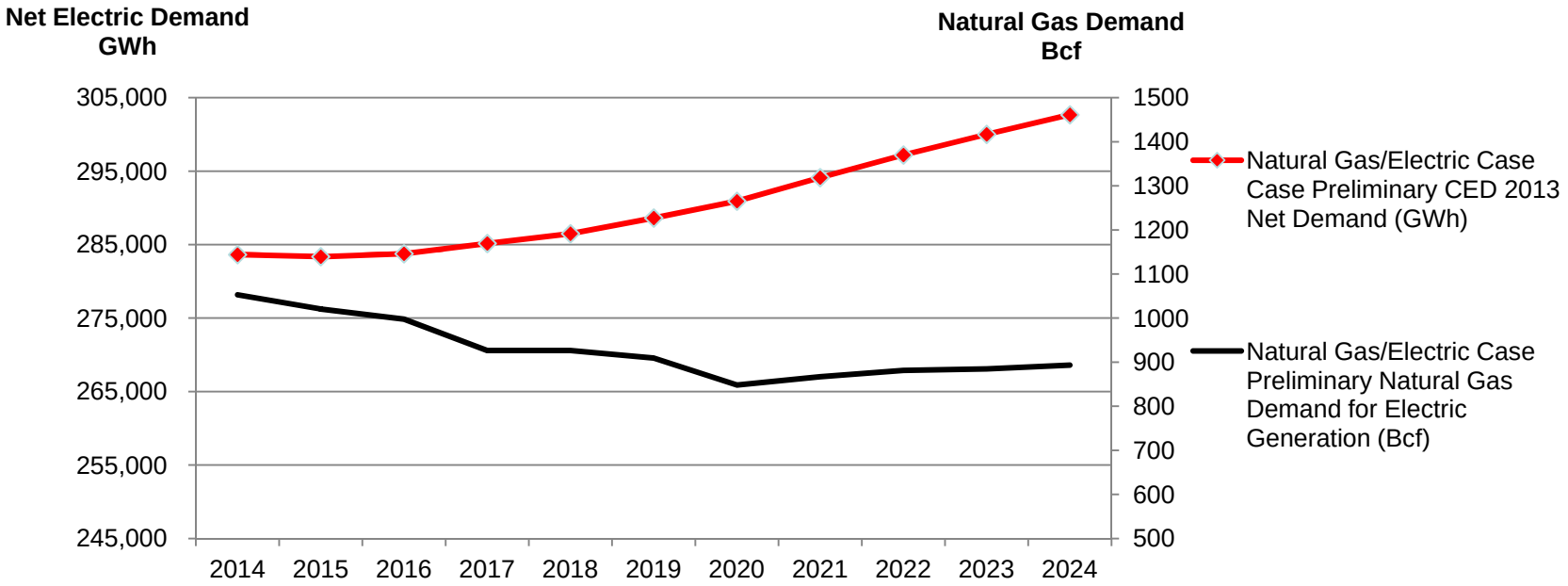
- Low Demand Case includes ***highest*** levels of IUEE and new on-site CHP - create negative load growth in early part of forecast period
- Growth in renewable generation lower than the Mid Demand Case, but still projected earlier in forecast period due to investment tax credit expiration by 2017
- -3.9% average annual (2014-2024) decline in natural gas demand for electric generation

High Demand Case - California Electricity Demand and Natural Gas Demand For Electric Generation



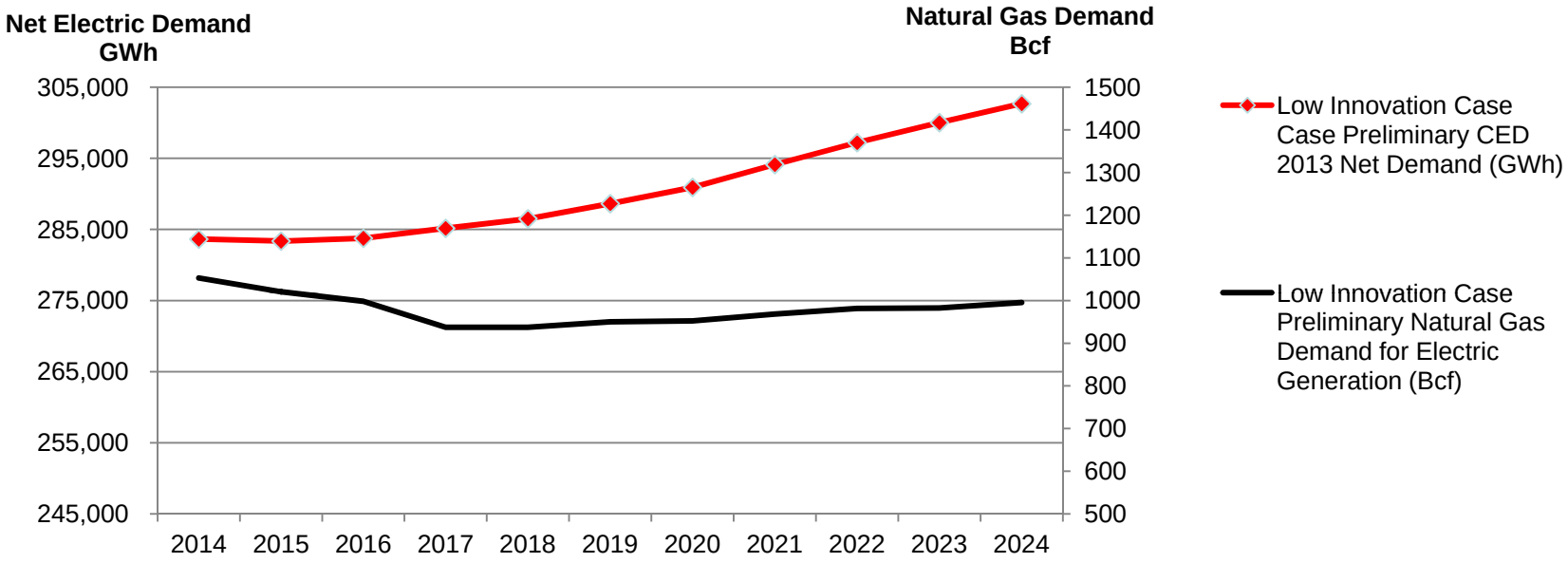
- High Demand Case includes ***lowest*** levels of IUEE and new on-site CHP creating only a slight decline in load growth in early part of forecast period
- Growth in renewable generation higher than the Mid Demand Case
- -1.3% average annual (2014-2024) decline in natural gas demand for electric generation

Natural Gas/Electric Case - California Electricity Demand and Natural Gas Demand For Electric Generation



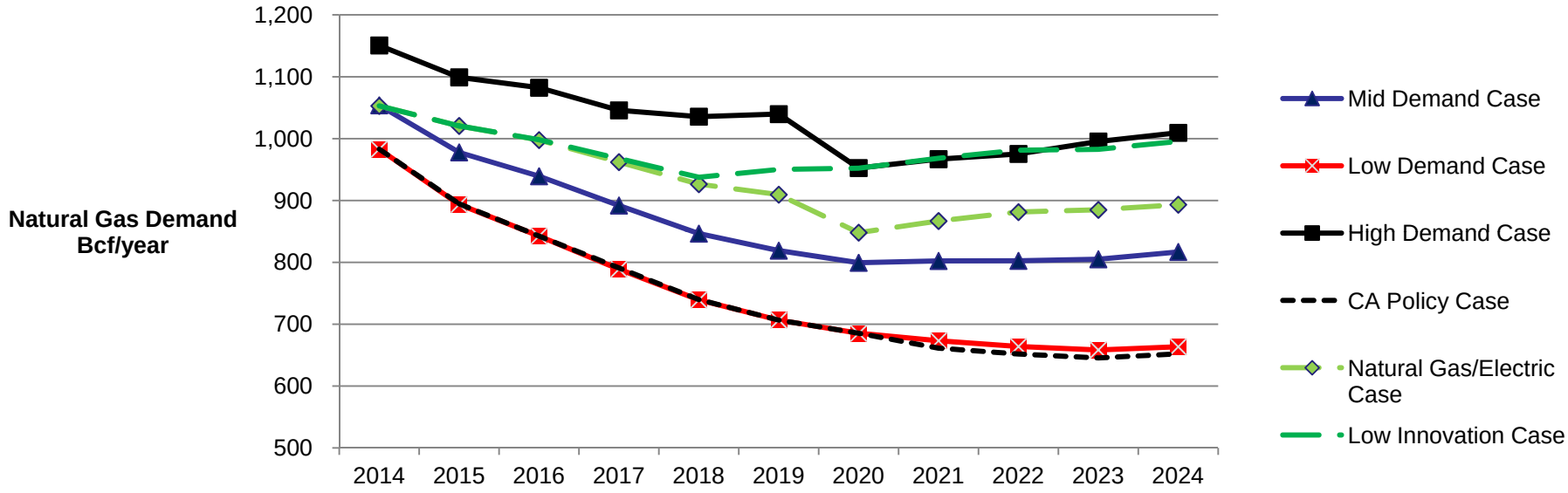
- Mid Case Demand with zero IUEE assumed in CA with Mid Case new on-site CHP - cause flat load growth in early part of forecast period
- Assumes California reaches 39% RPS by 2024
- -1.6% average annual (2014-2024) decline in natural gas demand for electric generation

Low Innovation - California Electricity Demand and Natural Gas Demand For Electric Generation



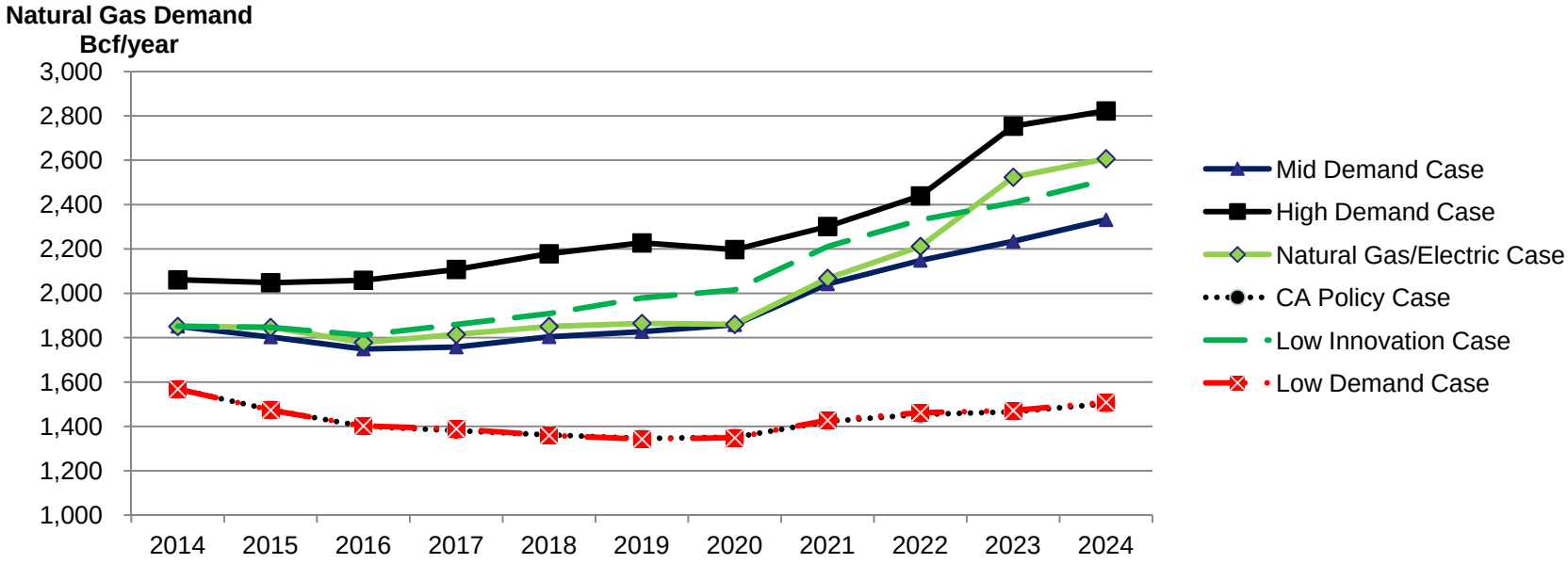
- Mid Case Demand with zero IUEE assumed in CA with Mid Case new on-site CHP create flat load growth in early part of forecast period
- Slight increase in renewable energy due to zero IUEE
- -0.6% average annual (2014-2024) decline in natural gas demand for electric generation

All Cases – California Natural Gas Demand For Electric Generation



- High Demand and Low Innovation Case natural gas demand converge in California due to consideration of lower and no incremental EE goals, with similar levels of renewables in the Low Innovation Case and High Demand Case
- Natural Gas/ Electric and Low Innovation Case diverge by CA RPS assumptions (Natural Gas/Electric 39% RPS by 2024)

All Cases – WECC Wide Natural Gas Demand For Electric Generation



- Natural Gas/Electric and High Demand Cases increase in natural gas demand at the end of the forecast period is driven by the assumed coal plant conversions to natural gas at San Juan (3-4), Navajo (1-3), Intermountain (1-2) and Boardman (biomass)

Next Steps

- Update electricity system simulations with final demand forecast including IUEE
- Consider variations of CHP penetration scenarios
- Evaluate power plant performance metrics (capacity factors, heat rate levels)
- Compare and coordinate with CAISO, other California natural gas and electric utilities and WECC running electric simulation studies