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Filer:	Raquel Kravitz
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California Energy Commission

Scope of the 2017 Natural Gas Market Trends and Outlook Report

Integrated Energy Policy Report Workshop

California Energy Commission

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Jennifer Campagna

Leon D. Brathwaite

Supply Analysis Office

Energy Assessments Division

Background

Natural Gas Market Trends and Outlook Report

- **Produced every two years as part of the California Energy Commission's Integrated Energy Policy Report (IEPR)**
- **Reports are required by statute:**
  - **Section 25302 of the California Public Resources Code requires that the IEPR contains an overview of major energy trends and issues facing the state**
  - **Section 25303 of the California Public Resources Code requires the Energy Commission to conduct natural gas (and electricity) forecasting and assessment activities in support of the IEPR**

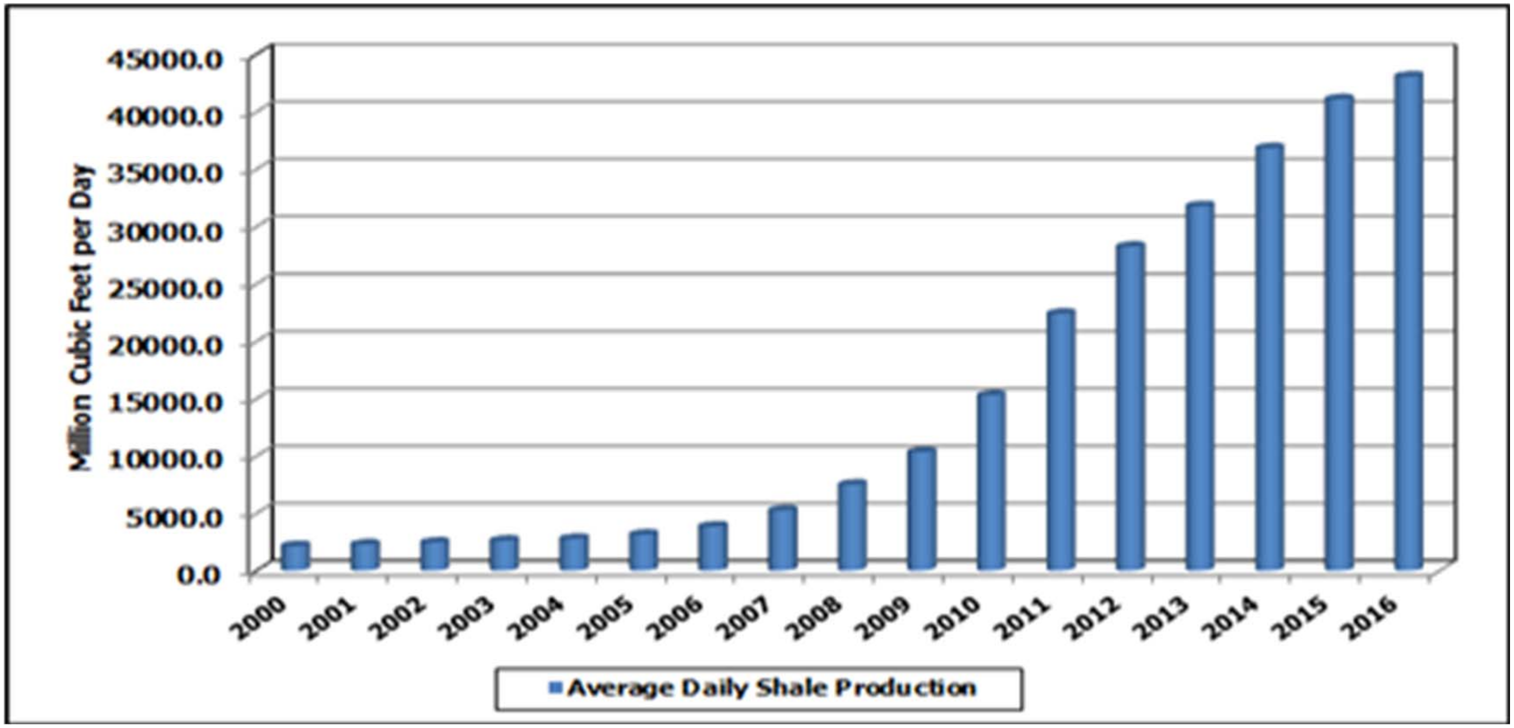
Natural Gas Demand

- U.S. historical demand
  - ✓ Significant increase in power generation NG demand since 2008
  - ✓ Some growth in industrial sector
  - ✓ Residential and commercial flat
- California historical demand
  - ✓ Clean energy policies (i.e., RPS) impact on natural gas demand
  - ✓ Flattening of natural gas demand in all sectors
- California demand forecast
  - ✓ Residential, commercial, industrial - done by Demand Analysis Office
  - ✓ WECC power plants - done by PLEXOS (another presentation)
- Growing exports to Mexico and LNG

Natural Gas Sources and Production

- Production and reserves in the U.S. are rising
  - ✓ U.S. - largest natural gas producer in world (2016)
  - ✓ Gas production over 77,000 MMcf/day (2016)
  - ✓ Proved reserves at 300 Tcf (2015)
- Shale natural gas is the main driver
  - ✓ 60% of U.S. dry gas production originates from shale
  - ✓ Environmental concerns regarding disposal of wastewater and emissions
- LNG imports to the United States are declining

Daily Natural Gas Production from Shale (U.S.)



Source: U.S. EIA

Natural Gas Infrastructure

- **Natural Gas Infrastructure**
  - **U.S. natural gas system**
    - ✓ 318,000 miles of interstate and intrastate pipelines; over 2.2 million miles of gas distribution lines
    - ✓ Development of NG resources in Northeast & other regions has led to the construction of additional pipeline capacity
  - **California natural gas system**
    - ✓ 12.89 Bcf/day delivery capacity of interstate pipelines; in-state receipt capacity of 9 Bcf/day
    - ✓ Peak demand of 11.157 Bcf can be a challenge for the system
  - **Long-term role of storage in California**
    - ✓ Aliso Canyon, Los Medanos, Pleasant Creek
    - ✓ Declining natural gas use
  - **U.S./California Infrastructure Safety Issues**
    - ✓ San Bruno explosion , Aliso Canyon gas leak
    - ✓ Aging infrastructure

Natural Gas Prices and Supply Outlook

- NAMGas model
- Three IEPR common cases
  - ✓ High Demand
  - ✓ Mid Demand
  - ✓ Low Demand

- NAMGas presentation will discuss projections for:
  - ✓ Natural gas hub prices
  - ✓ U.S. demand
  - ✓ U.S. production

Natural Gas Issues

- Gas-Electric Coordination
- Impact of Increased Renewables
- Switching from Coal to Natural Gas Generation, especially in eastern U.S.
- California’s Unique Issues
  - ✓ State’s position at the end of several major interstate pipeline systems
- The Changing Market in Mexico
  - ✓ Mexico’s Increasing Demand for Natural Gas
  - ✓ United States Exports to Mexico
- LNG Exports from the United States
  - ✓ Market changes – U.S. positioned to become net exporter
  - ✓ U.S. could become third largest LNG producer for export by 2020

Methane Emissions from the Natural Gas System

- Leakage can occur throughout NG system
- Methane emissions
  - 10 percent of total GHG emissions in California
- Estimating methane emissions
  - Bottom-up or Top-down
- Multiple studies (e.g. EDF)
- State and Federal Greenhouse Gas Inventories
- California efforts (e.g. legislation, research funding)
- Tracking in-state and out-of-state emissions (Senate Bill 839)
  - Working with CARB
  - Progress report completed September 2017

2017 Natural Gas Outlook Report

Comments and Questions?

Jennifer Campagna, Jennifer.Campagna@energy.ca.gov, 916-654-4710

Leon Brathwaite, leon.brathwaite@energy.ca.gov, 916-654-4771