

# Potential Supply of Natural Gas in the United States

Report of the Potential Gas Committee  
(December 31, 2016)



Press Conference, Washington, D.C., July 19, 2017

# Executive Summary

2

- Potential Gas Committee (PGC):
  - Non-profit group of ~80 volunteer geoscientists and engineers.
  - Biennial assessments of technically recoverable U.S. natural gas endowment since 1964.
- Assessment as of year-end 2016 (mean values):
  - 2,817 Tcf of total U.S. technically recoverable gas resources:
    - 302 Tcf or 12% increase over the previous year-end 2014 assessment.
    - Shale gas resources (1,797 Tcf) account for 64% of total gas resources.
  - Total U.S. future gas supply (reserves+resources) stands at record 3,141 Tcf.

# Organization

3

## Potential Gas Committee (PGC)

~80 volunteers

Ronald J. Kelley  
President/General Chairman

Natalie H. Reagan  
Chairman of the Board

- Recruits personnel and supervises work
- Develops assessment policy and procedures
- Directs and manages studies of gas resources
- Prepares reports on natural gas resources

## Potential Gas Agency (PGA) Colorado School of Mines

Supported by industry

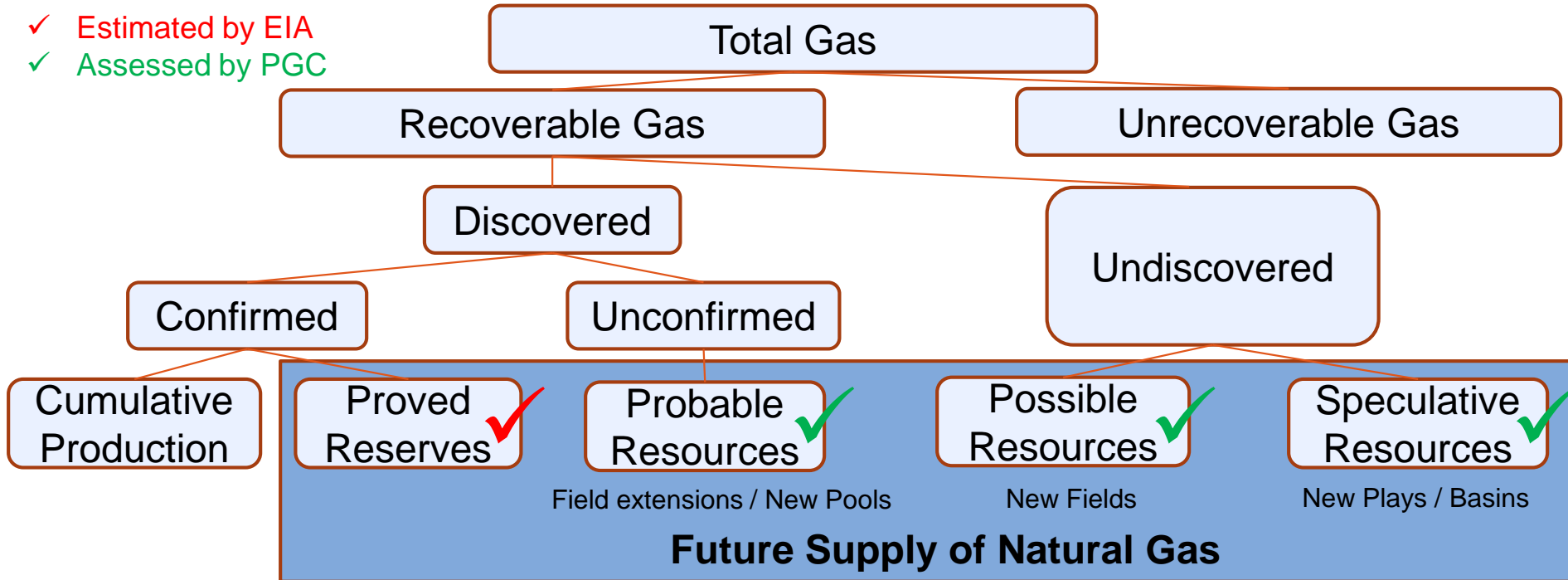
Dr. Alexei V. Milkov  
Director

- Approves criteria and methods
- Ensures maintenance of standards and objectivity
- Reviews and evaluates reports
- Publishes final assessments of gas resources

# PGC assesses future supply of natural gas

4

- ✓ Estimated by EIA
- ✓ Assessed by PGC



# 7 PGC work areas and 90 geologic provinces

5



- Settings:
  - Onshore
  - Offshore
- Depth intervals:
  - Shallow (0-15,000 ft.)
  - Deep (15,000-30,000 ft.)
- Reservoir types:
  - Traditional:
    - Conventional and tight
    - Shale gas
  - Coalbed gas (CBM)

# PGC resource assessment methodology

6

- Province-level assessments:
  - Publically-available data.
  - Individual expert judgement by practicing geoscientists and engineers.
  - Group discussions and peer-reviews.
  - Minimum – Most Likely – Maximum resource values for each province.
- Area-level assessments:
  - Statistical aggregation of province-level assessments to calculate Mean resources values.
- National-level assessment:
  - Statistical aggregation of area-level assessments to calculate mean Grand Total resources for the U.S.
  - Mean values for different types of reservoirs and different resource categories.
  - Addition of EIA's latest published proved reserves (year-end 2015) to calculate future gas supply.

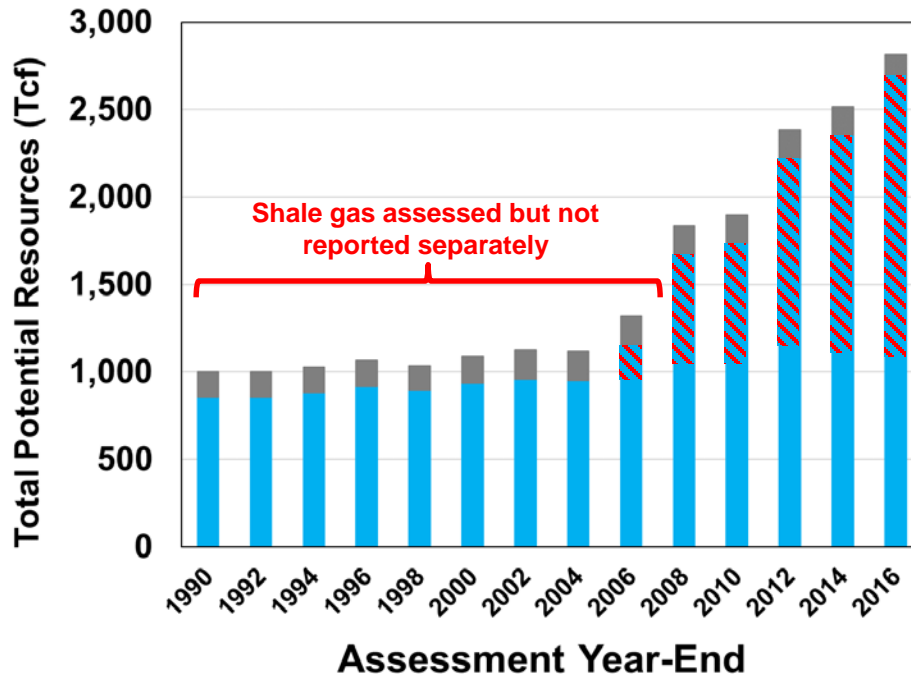
# Year-end 2016 assessment results

7

	<b>Mean Technically Recoverable Volumes</b> (trillion cubic feet or Tcf)
Traditional gas resources (conventional, tight and shale reservoirs)	2,658.3
Coalbed gas resources	158.7
<b>Total gas resources</b>	<b>2,817.0</b>
Proved gas reserves (EIA, year-end 2015)	324.3
<b>Future gas supply in the U.S.</b>	<b>3,141.3</b>

# PGC gas resource assessments, 1990-2016

8



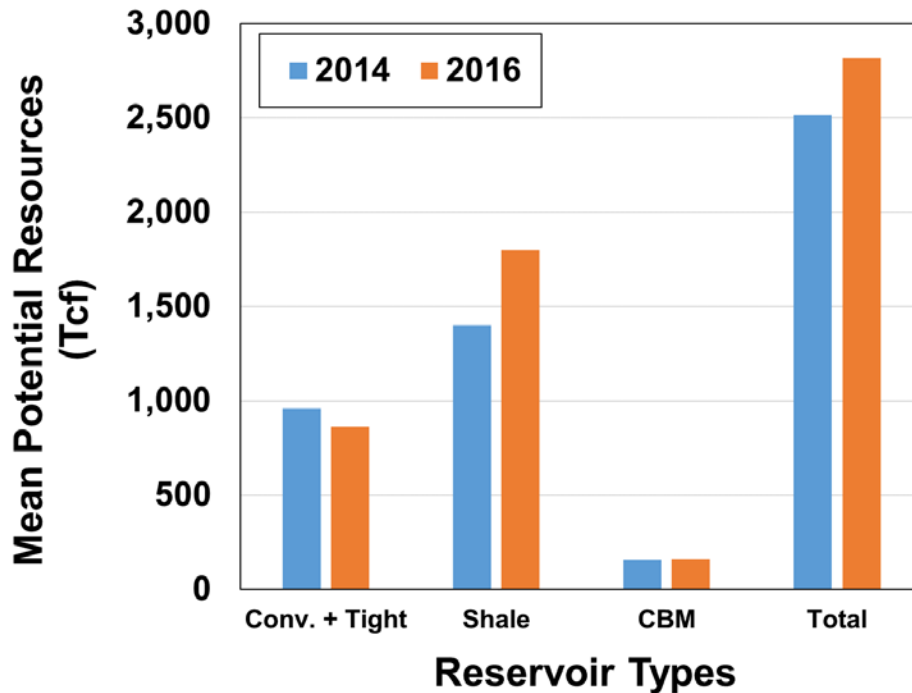
- Coalbed gas resources (mean values)
- Shale gas within Traditional resources (most likely values)
- Traditional gas resources: conventional, tight, shale (mean values)

- Continuous growth of gas resources.
- Shale gas is responsible for recent increase in gas resources.



# Change in gas resources relative to 2014: Reservoir types

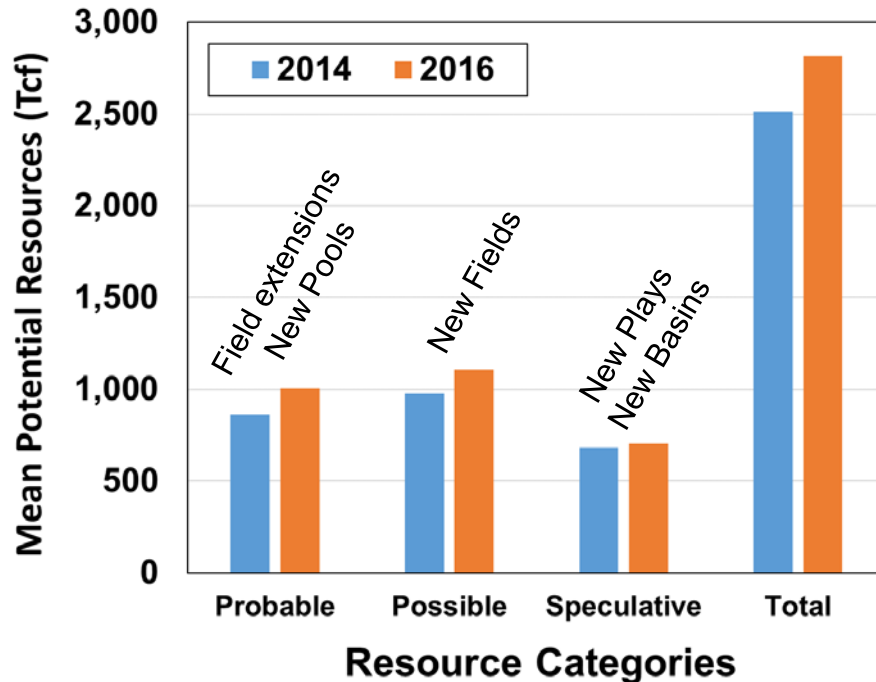
9



- Reduction of gas resources in conventional and tight sand/carbonate reservoirs (97 Tcf or 10%).
- Significant increase in shale gas resources (399 Tcf or 29%).
- Coalbed (CBM) resources are flat.
- Total mean potential gas resources increase of 302 Tcf or 12%.

# Change in gas resources relative to 2014: Resource categories

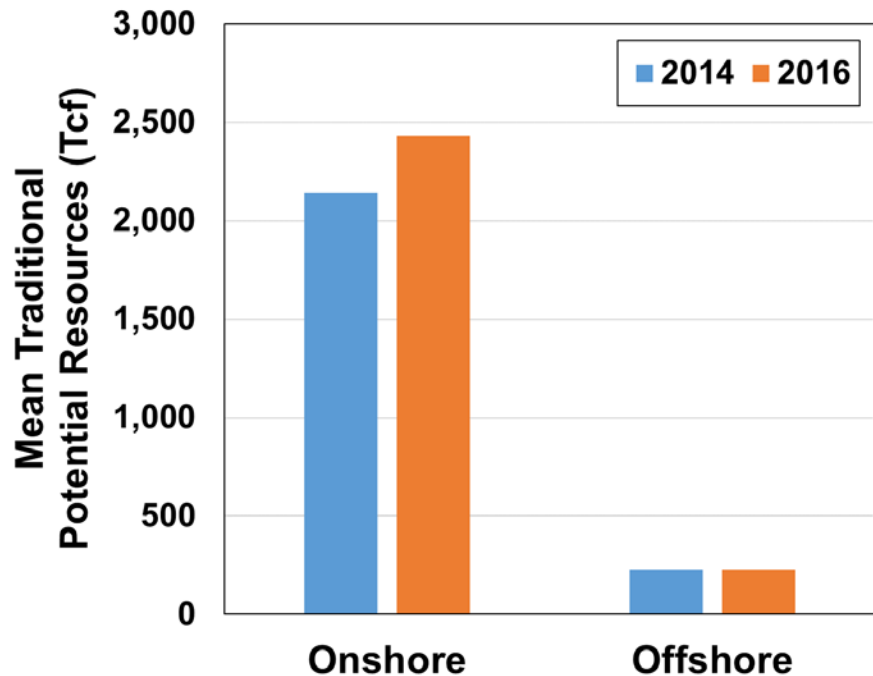
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- Resources increased in all categories.
- Probable and Possible resources increased significantly, reflecting continuous development of established plays.
- Little growth of Speculative resources due to limited frontier exploration.

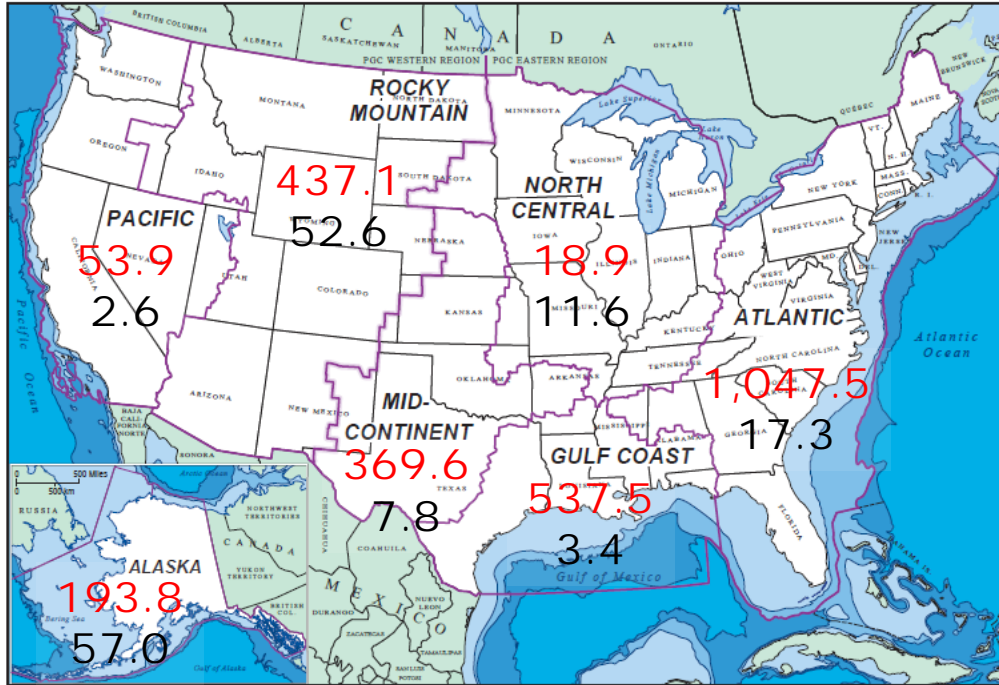
# Change in Traditional gas resources from 2014: Onshore vs Offshore

11



- Traditional resources:
  - Conventional and tight reservoirs
  - Shale reservoirs
- Significant increase in Onshore gas resources (290 Tcf or 14%).
- No change in Offshore resources.

# 2016 gas resource assessment for Areas

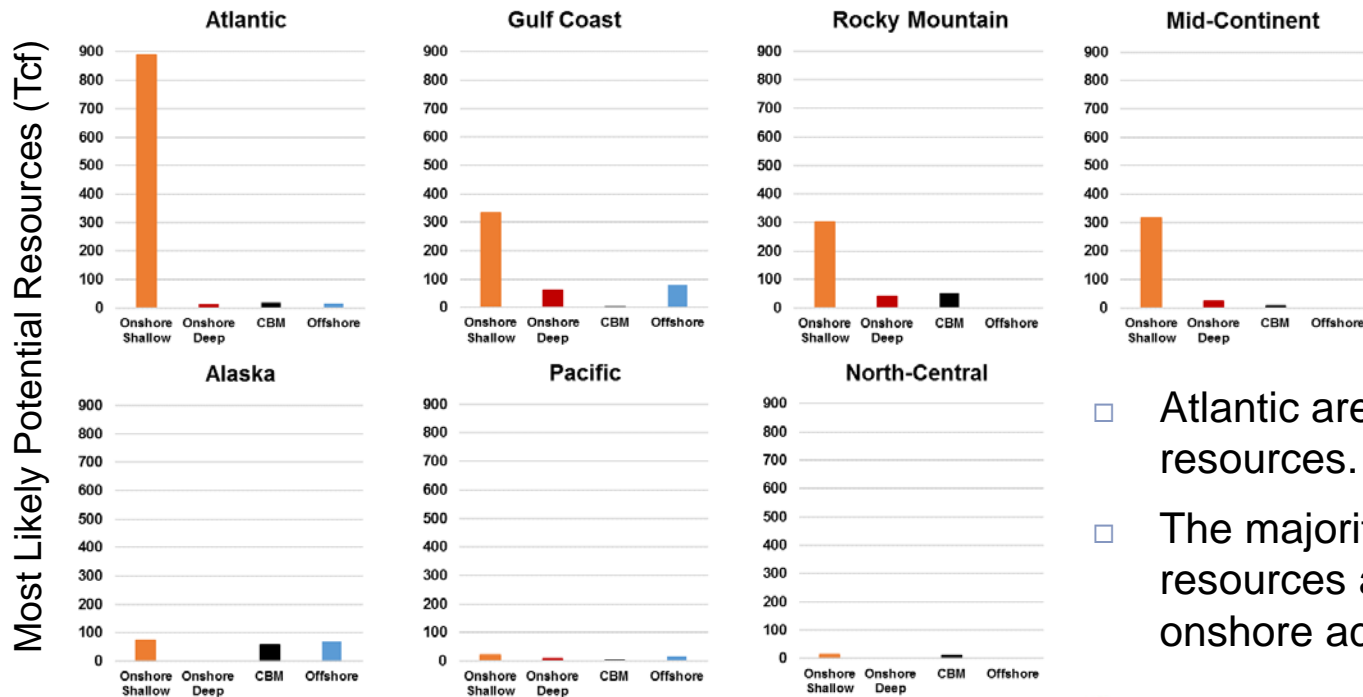


**Red values** – Total Traditional resources (conventional, tight, shale reservoirs) (mean values, Tcf)

**Black values** – Coalbed gas resources (most likely values, Tcf)

# Comparison of gas resources in Areas

13



- Atlantic area has most gas resources.
- The majority of gas resources are in shallow onshore accumulations.

# Areas ranked based on total gas resources (excluding coalbed gas)

14

PGC Assessment Area	Mean Technically Recoverable Volumes (trillion cubic feet or Tcf)	Proportion
Atlantic	1,047.5	39.4%
Gulf Coast	537.5	20.2%
Rocky Mountain	437.1	16.5%
Mid-Continent	369.6	13.9%
Alaska	193.8	7.3%
Pacific	53.9	2.0%
North Central	18.9	0.7%
<b>Total U.S.</b>	<b>2,658.3</b>	

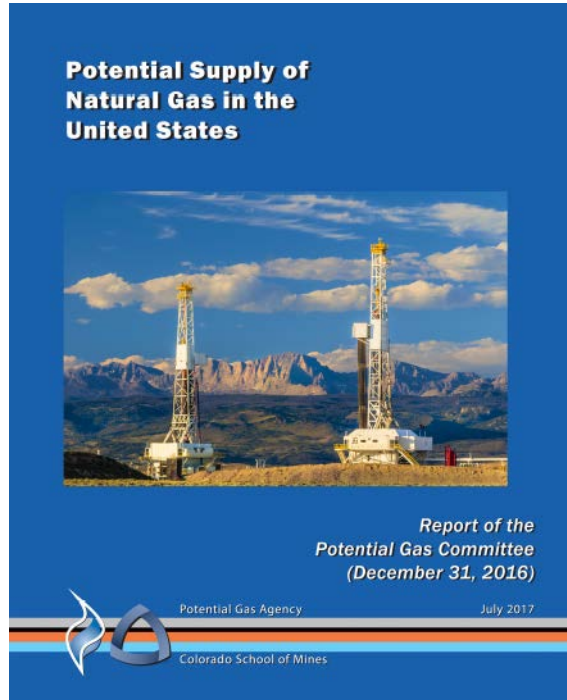
# Summary of year-end 2016 assessment

15

- 2,817 Tcf of total U.S. gas resources (mean value).
- 302 Tcf or 12% increase over the previous year-end 2014 assessment.
- Atlantic area has 39% of traditional U.S. gas resources.
- Shale gas accounts for 64% of total U.S. gas resources.
- Total U.S. future gas supply (reserves+resources) stands at record 3,141 Tcf. This is an increase of 288 Tcf or 10% over the previous year-end 2014 assessment.

# Additional information and report request

16



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