

# Understanding the Impact of Selling the Helium Reserve

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Beckman Center of the National Academies  
Irvine, CA

Chaired by Charles G. Groat (University of Texas at Austin) and  
Robert Richardson (Cornell University)

# Background of Study

Statement of Task excerpt –

“The study will determine whether selling off the U.S. Helium Reserve in the manner prescribed by law has had any adverse effect on U.S. scientific, technical, biomedical, and national security users of helium.”

Outline –

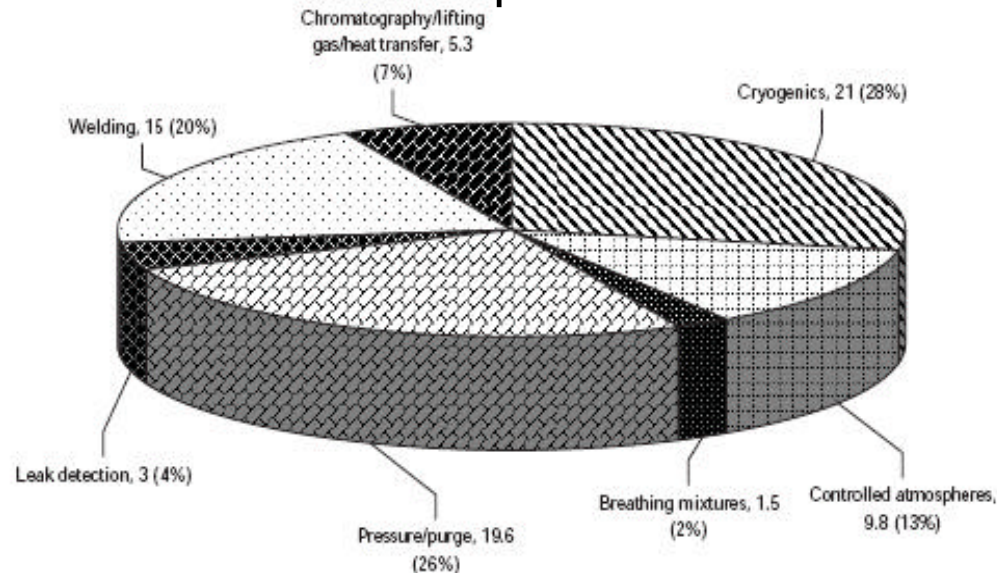
- Brief Introduction to Helium – its uses and supplies
- Historical role of federal government in the helium market
- Recent events triggering the study
- Where the study stands

# Background – Helium Characteristics, Uses

Why Helium's valuable –

- Liquefies at very low temperatures and doesn't solidify at all under standard conditions
- Chemically inert
- Buoyant
- Thermally conductive
- Diffusive

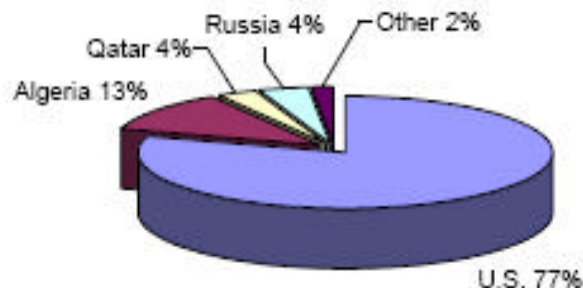
U.S. Helium Consumption – 2006 – ~2.6 bcf



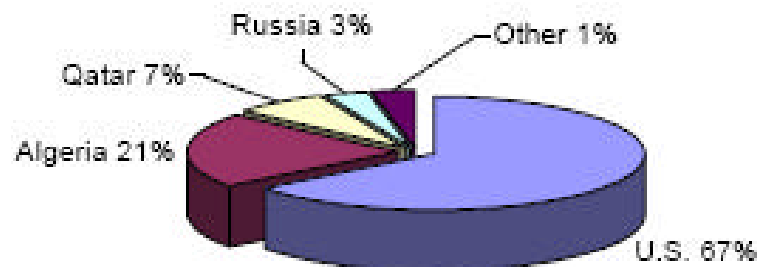
# Background – Helium Supplies

- Derived market –
  - dependant upon natural gas fields/production
  - liquefied natural gas as a new source
- On demand commodity
- Centralized refining/supply chain
- Federal Helium Reserve

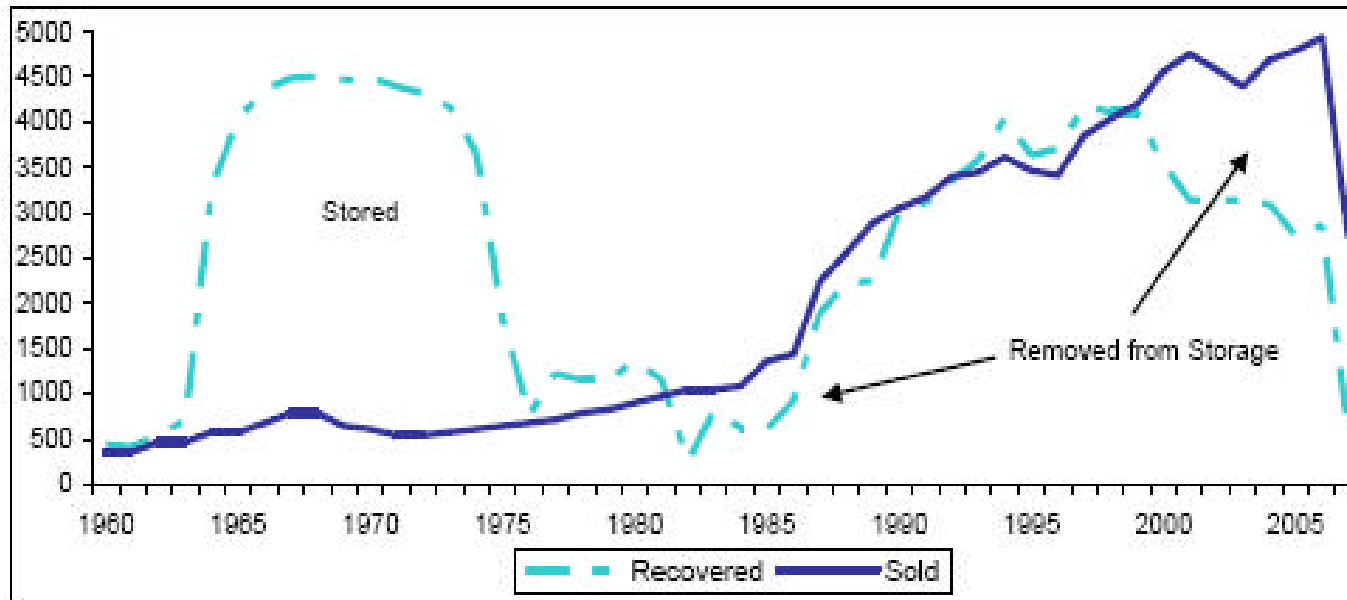
Worldwide Helium Production – 2007  
6.3 bcf



Worldwide Helium Production – 2010E  
8.3 bcf



# Helium Reserve

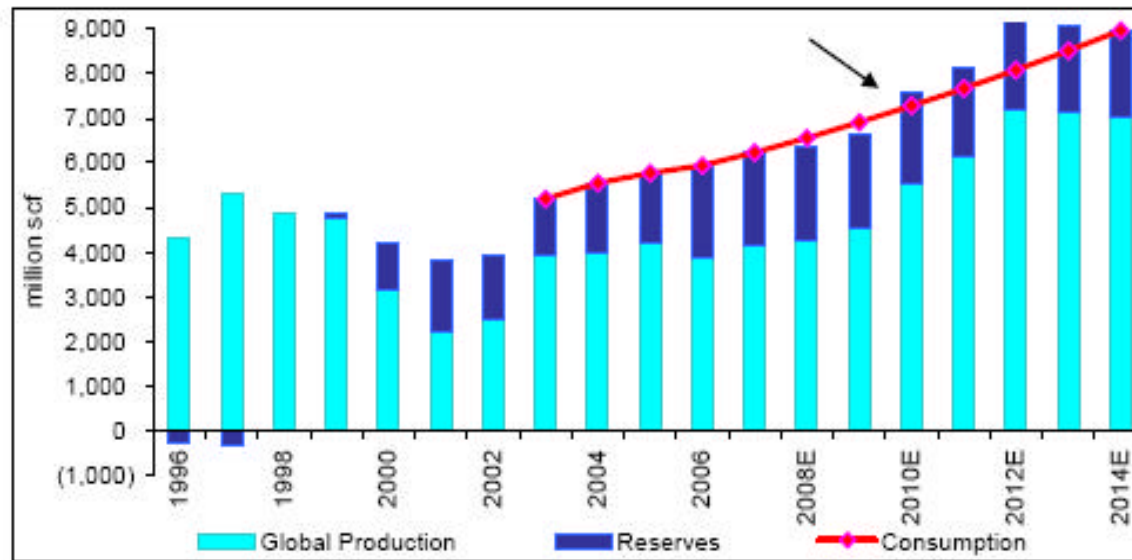


- Reserve initiated in 1960 as part of cold war efforts
- Vastly overestimated need
- Significant investment in stored helium led to 1996 Privatization Act -
  - Sell off helium by 2015 at a price to pay off US Treasury.
  - Fed entities must buy from BLM at set price.
  - Commission NAS study to insure won't negative impact national interests.

## 2000 NAS Study

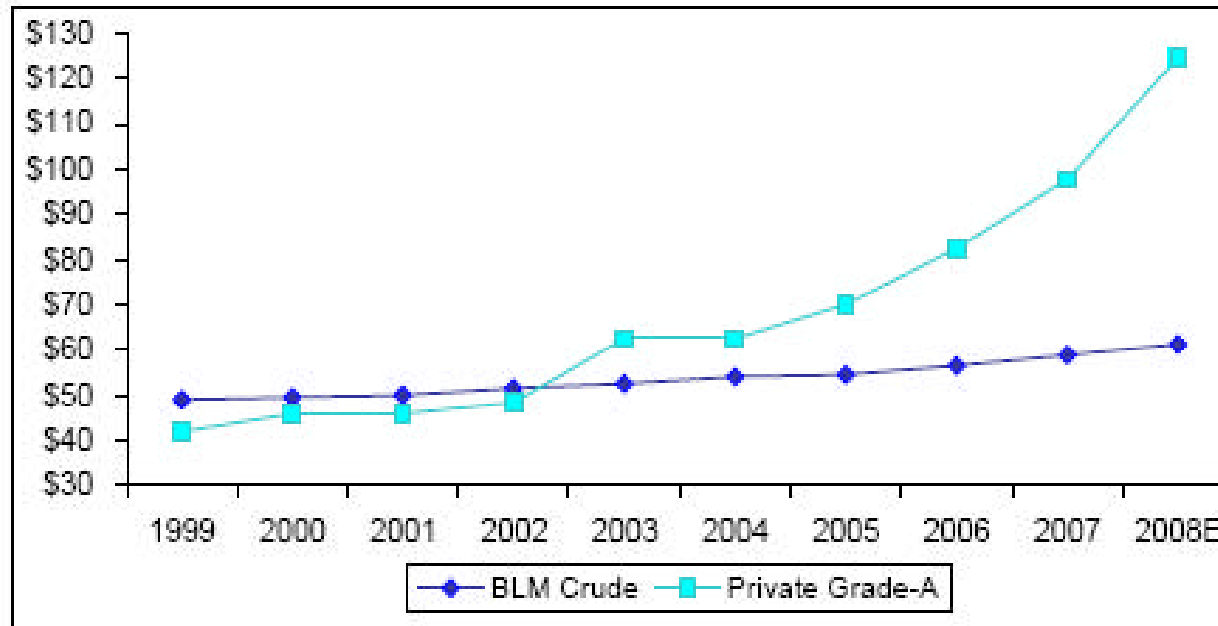
- Overall conclusion – Sell off would have no significant impact on helium users
- price, supply and demand should remain steady
- Federal Reserve would serve as last resort supply; would be available for some time
- Follow up activities recommended –
  - BLM commission study if situation changes
  - BLM more closely monitor market
  - BLM invest in reserve development

# Subsequent Events – Worldwide consumption and supply



- Consumption/supply fairly level – 1996-2003.
- 2003 onward - Increases in consumption from semiconductor/MRI primarily.
- Disruptions in supplies in 2006 created some shortages.
- Significant new supplies expected 2012.

# Pricing



**“Rising helium prices should lead to demand destruction at non-industrial helium consumers. Small science labs with less capital for helium conservation projects and small party business that use helium for balloon inflation are likely to be most vulnerable, whereas larger industrial manufacturers can install equipment to capture and recycle helium.”**

2008 Helium Market Research Report – Jefferies & Company



# 2008-2009 NAS Study

## *Statement of Task*

- The study will determine whether selling off the U.S. Helium Reserve in the manner prescribed by law has had any adverse effect on U.S. scientific, technical, biomedical, and national security users of helium. To provide a meaningful context for this effort, the study will examine the helium market and the helium industry supply chain.
- The study committee will address the following tasks:
  - **Review the report** "The Impact of Selling the Federal Helium Reserve" (NAP, 2000) and **compare projected expectations with actual outcome**. Determine the reasons for the differences.
  - Examine the availability and reliability of worldwide **supply**, **technical opportunities to increase** that supply—such as through improved recovery—and the relationships among supply, demand, and market price.
  - Assess the current and projected U.S. **marketplace** for refined helium, including worldwide helium demand by industrial and other users. Assess the role of private industry in future conservation efforts.
  - Assess the current "**flywheel**" concept for operating the Reserve. Develop scenarios for how the Reserve might be used to meet future helium demand.
  - Assess the role that **organizational and financial factors** play in meeting the goals of the Federal Helium Program. Identify measures that would enable the Program to **respond more effectively to the dynamics of the helium industry**.

# Committee Membership

- The Committee selected
  - includes expertise in research-related applications for helium; cryogenics; specialty welding; specialty materials; and liquid-fueled rocket operations.
  - Contains members with expertise in helium production, refining, and distribution and the closely related industries
  - Also includes those with expertise to evaluate the economic and market factors involved.

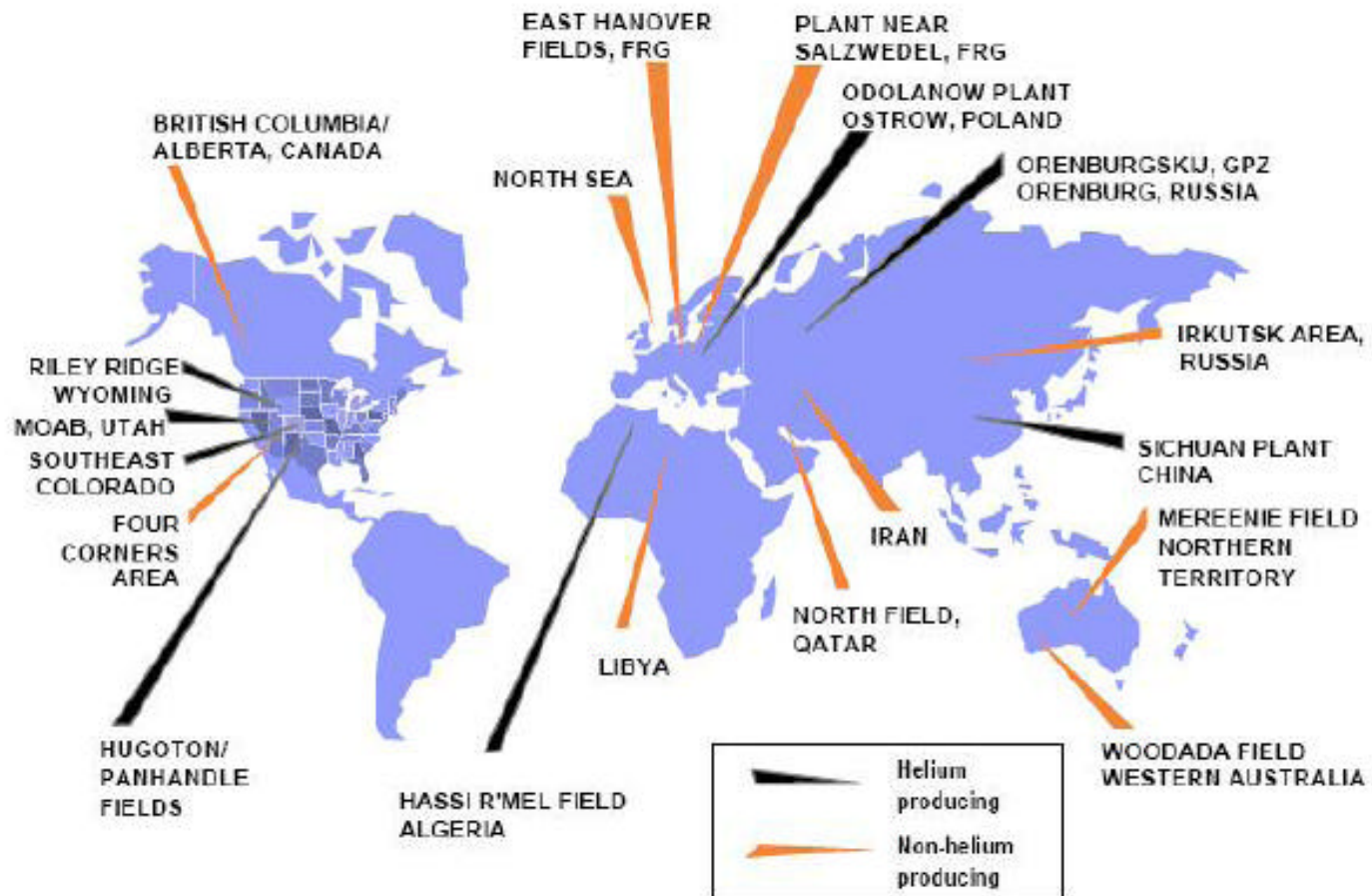
<b>Charles G. Groat</b> , University of Texas at Austin, <i>Co-Chair</i>	<b>Norman E. Hartness</b> , Independent Consultant
<b>Robert C. Richardson</b> , Cornell University, <i>Co-Chair</i>	<b>W. John Lee</b> , Texas A&M University
<b>Robert R. Beebe</b> , Independent Consultant	<b>David C. Mowery</b> , University of California, Berkeley
<b>John R. Campbell</b> , J. R. Campbell & Associates, Inc.	<b>Albert Migliori</b> , NHMFL
<b>Moses H. Chan</b> , Pennsylvania State University	<b>Michael Prats</b> , Michael Prats & Associates, Inc.
<b>Carol Dahl</b> , Colorado School of Mines	<b>J. Benjamin Reinoehl</b> , RMW Solutions
<b>Janie Chermak</b> , University of New Mexico	<b>Igor Sekachev</b> , TRIUMF
<b>Thomas Elam</b> , NASA	<b>Thomas Siewert</b> , NIST
<b>Allen M. Goldman</b> , University of Minnesota	<b>Mark Thiemens</b> , University of California at San Diego

## Committee Activities

- Two committee meetings have been held to gather data, generate ideas, hold discussions, and build consensus.
  - Heard from support agencies – DOE, NSF, DOD
  - Heard from industry representatives
  - Heard from significant users – NASA, DESC
  - Surveyed other users
- Two more committee meetings (11/3-5/08, 1/28-29/09) are scheduled to complete data-collection and produce report
- Target release date of approved prepublication draft is April 2009
  - Final editing, design, layout, illustration and publication by the National Academies Press will occur afterward.

# Questions and Comments

## Natural Gas Fields Containing Helium



## Worldwide Demand for Helium by Application 2006

