

Justification for Proposing a Study of Large Petroleum Fields

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U.S. Geological Survey

UNECE Ad Hoc Group of Experts on Supply of Fossil Fuels

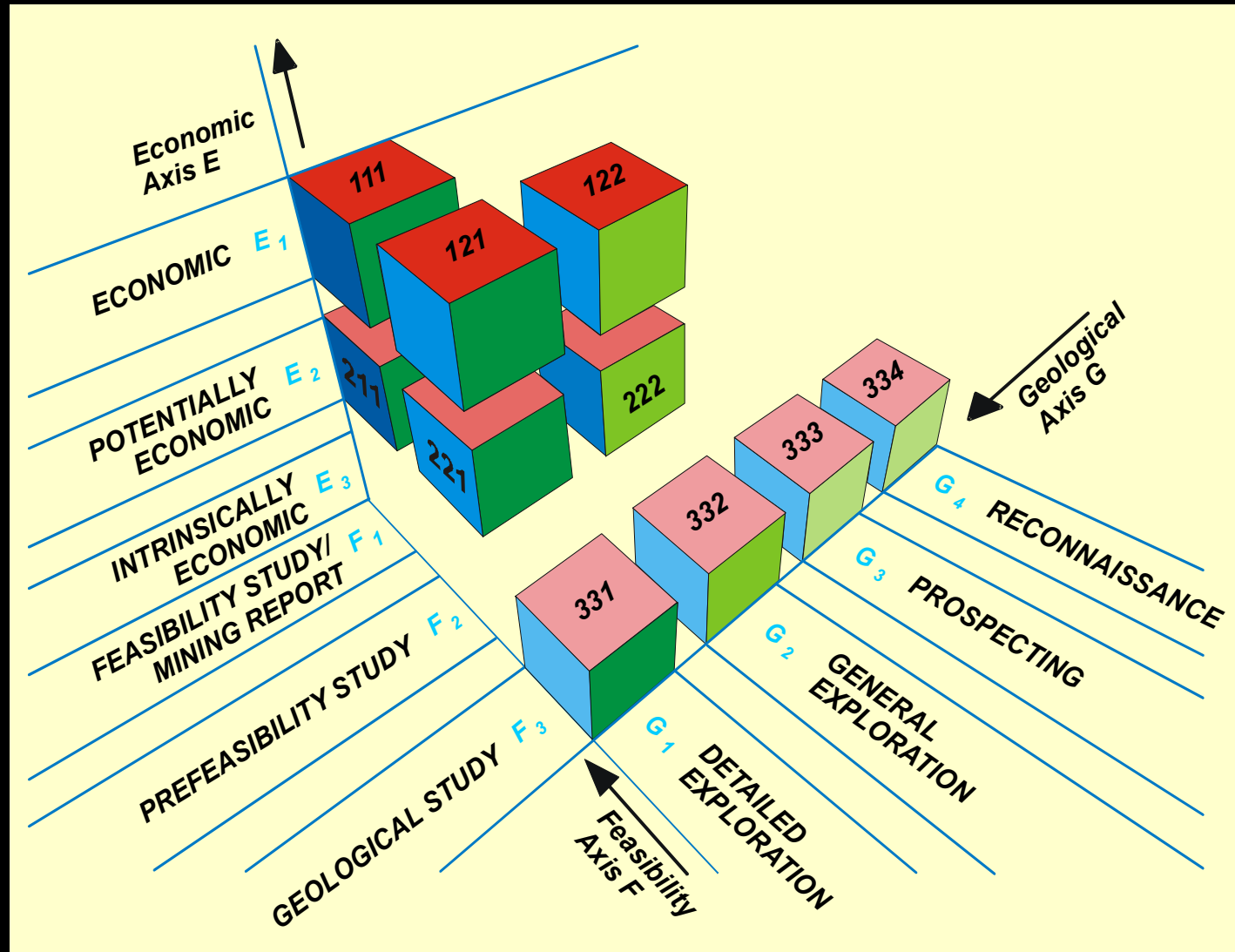
10-11 November 2004

Geneva, Switzerland

Introduction

- Large Fields
 - Much of the world's petroleum
 - Reserves estimates revised upwards
- Recovery processes irreversible
- Maximize economic recovery

UNFC

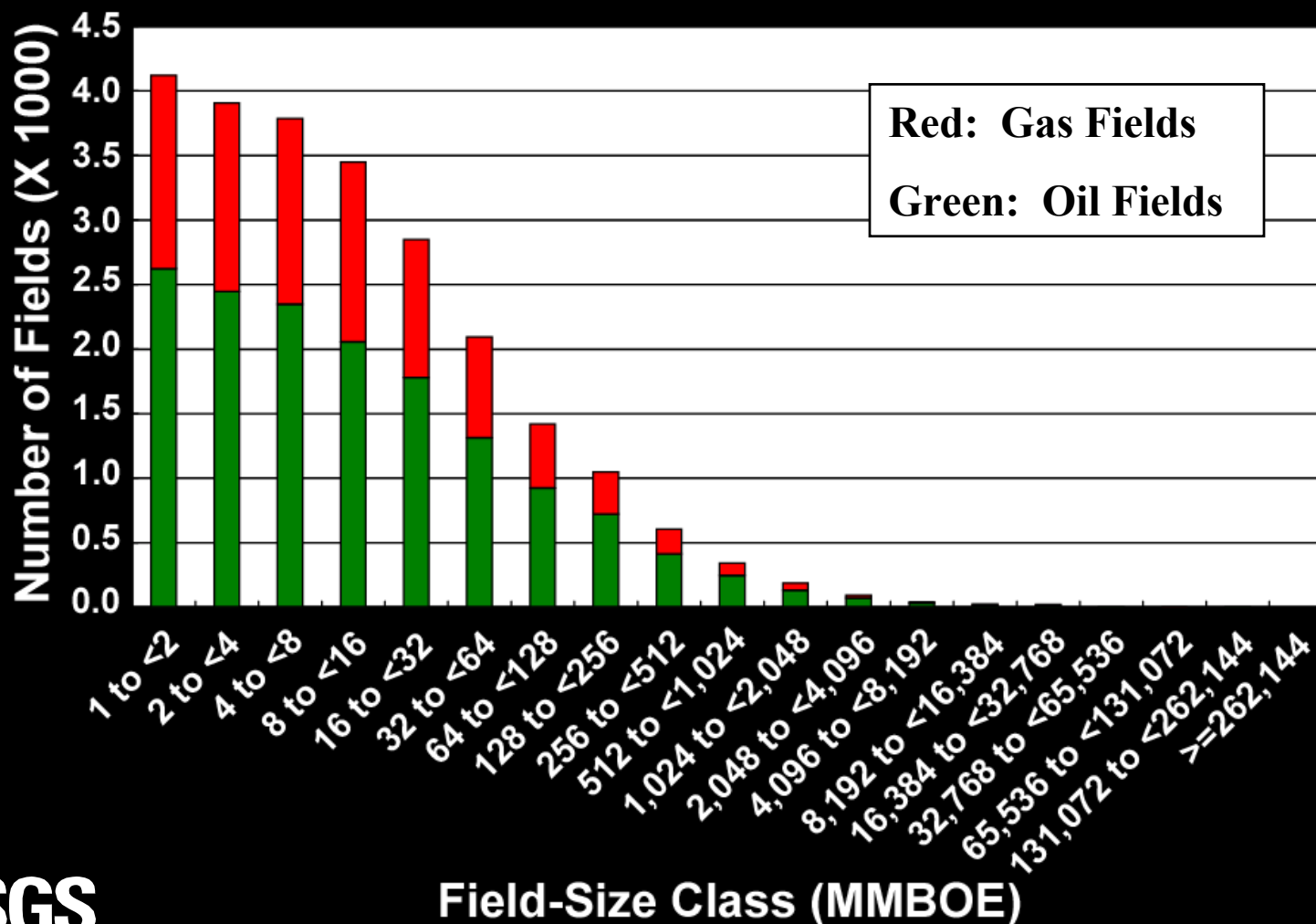


Outline

- Field-size distributions
- Reserve growth
- Giant fields
- Conclusions

Field Size Distributions

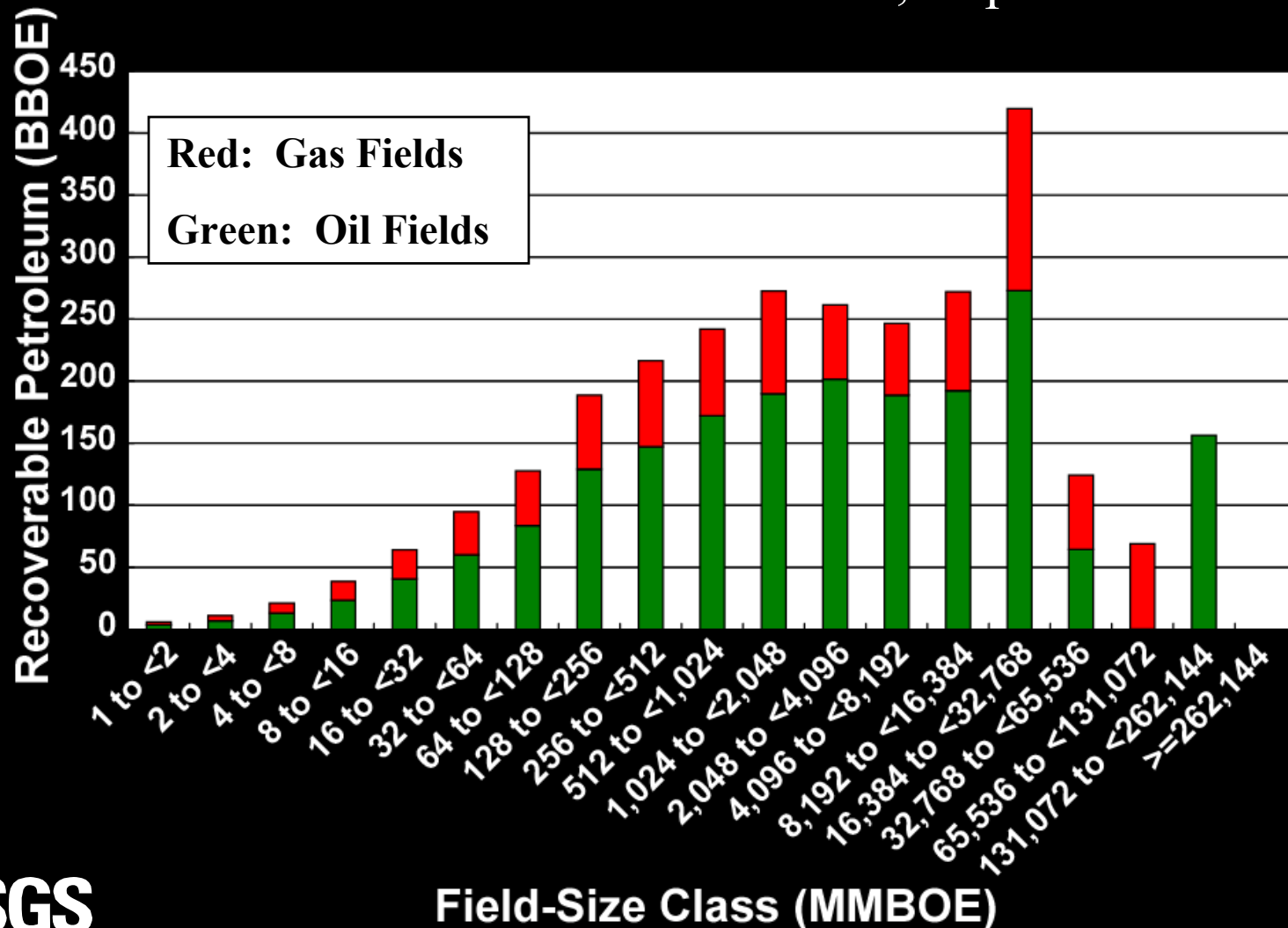
Recoverable Crude Oil and Natural Gas, Reported in 1996



Field-Size Class (MMBOE)

Field Size Distributions

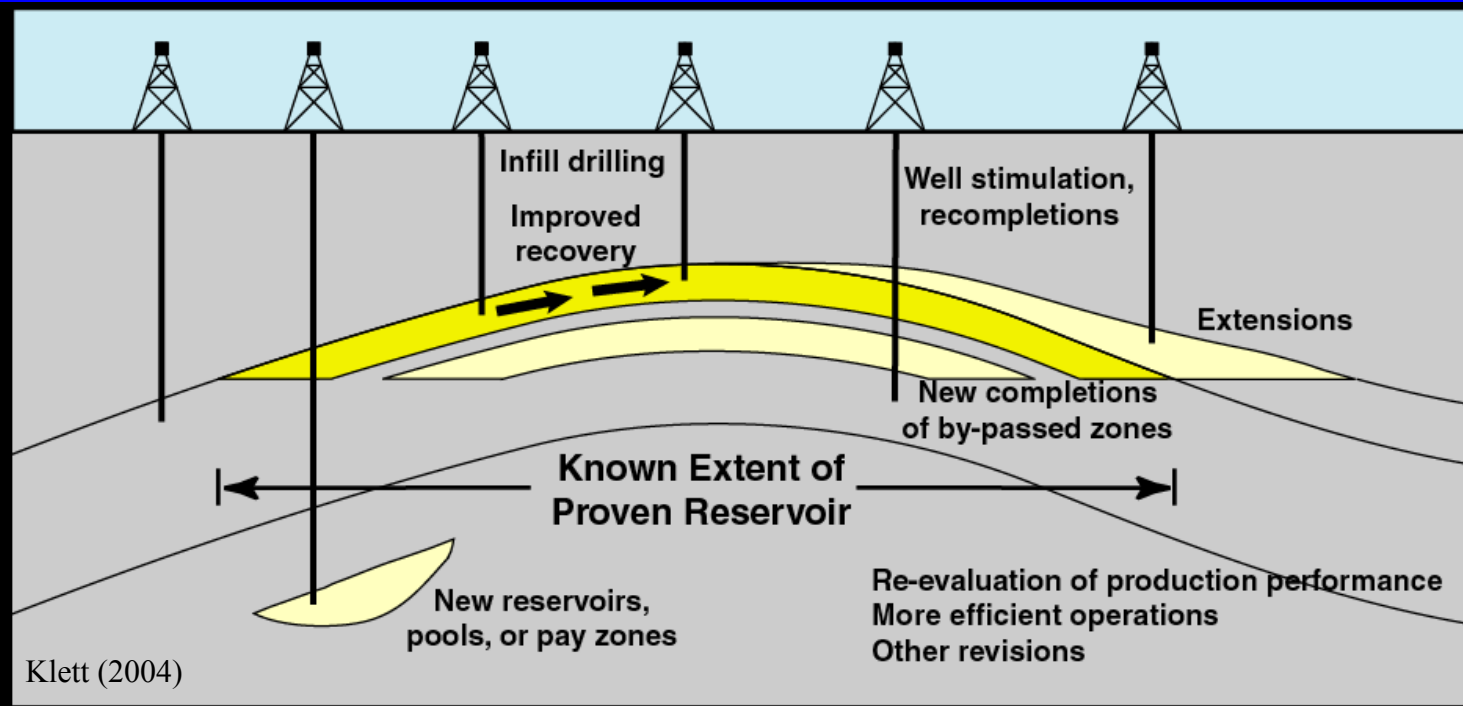
Recoverable Crude Oil and Natural Gas, Reported in 1996



Field-Size Class (MMBOE)

From Klett and others (1997), data from IHS Energy Group (1996)

Reserve Growth



Increases in successive estimates of recoverable volumes of crude oil, natural gas, and natural gas liquids in discovered fields

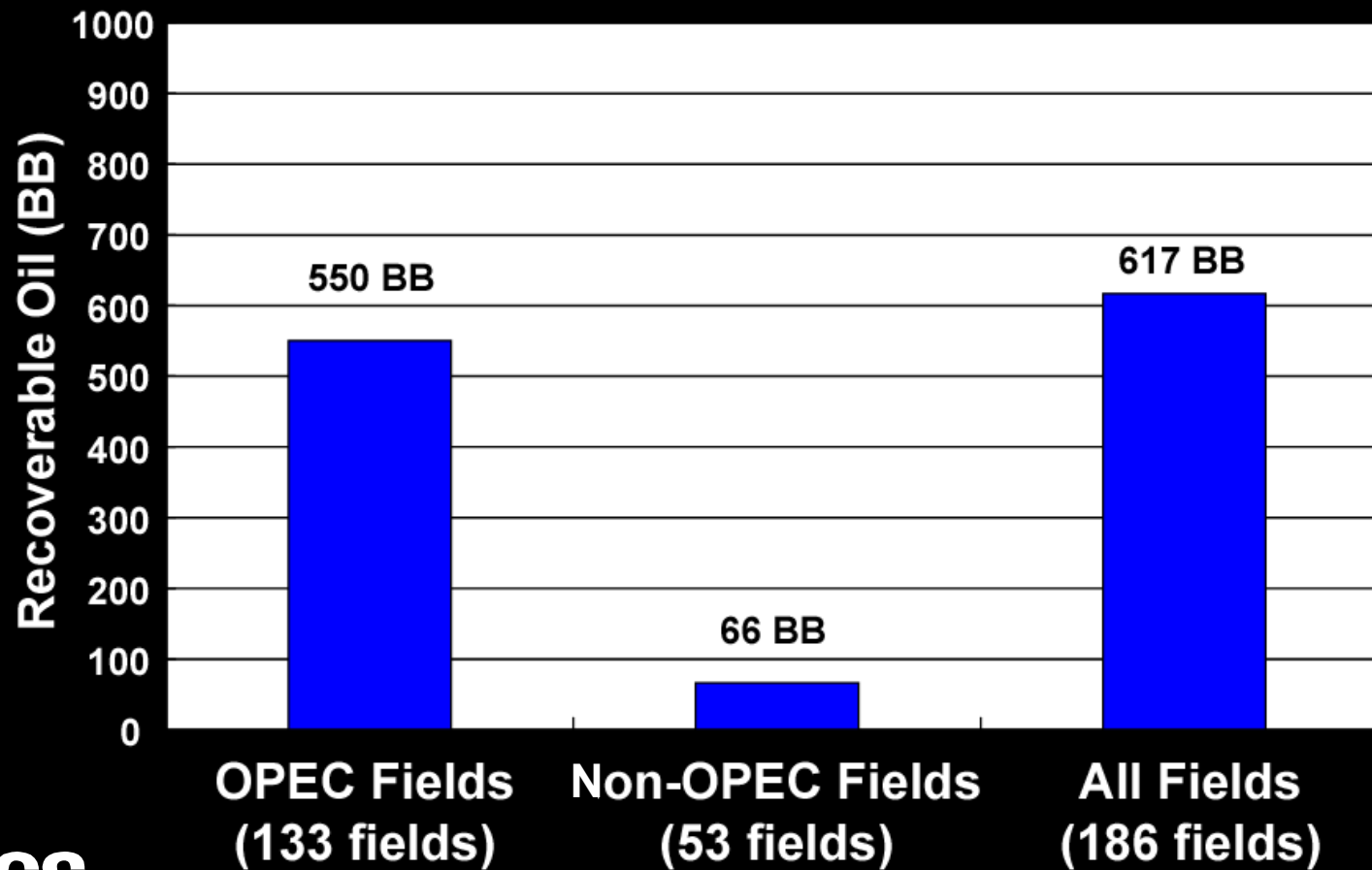
- Delineation of additional in-place volumes (geological)
- Increases in recovery efficiency (technological)
- Recalculation of reserves in dynamically changing conditions (definitional)
 - Economic, operating, political, and regulatory

Recoverable and Reserve Volumes

- Recoverable volumes
 - Estimated periodically
 - Cumulative production and remaining reserves
- Reserves
 - Initially conservative
 - Current conditions
 - Reasonable certainty

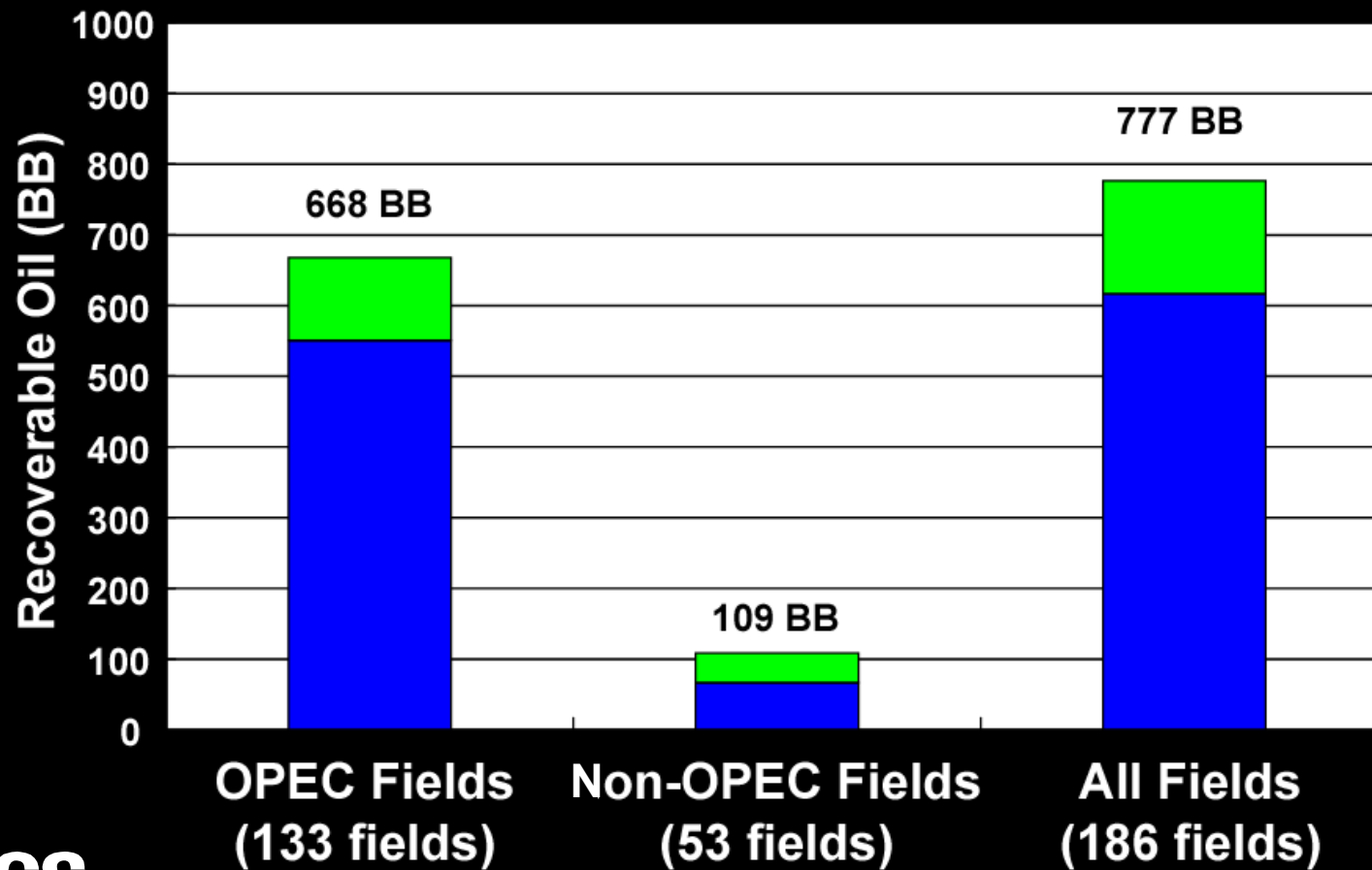
Giant Oil Fields (≥ 0.5 Billion Barrels)

Reported in 1981



Giant Oil Fields

Reported in 1996 (15 years)

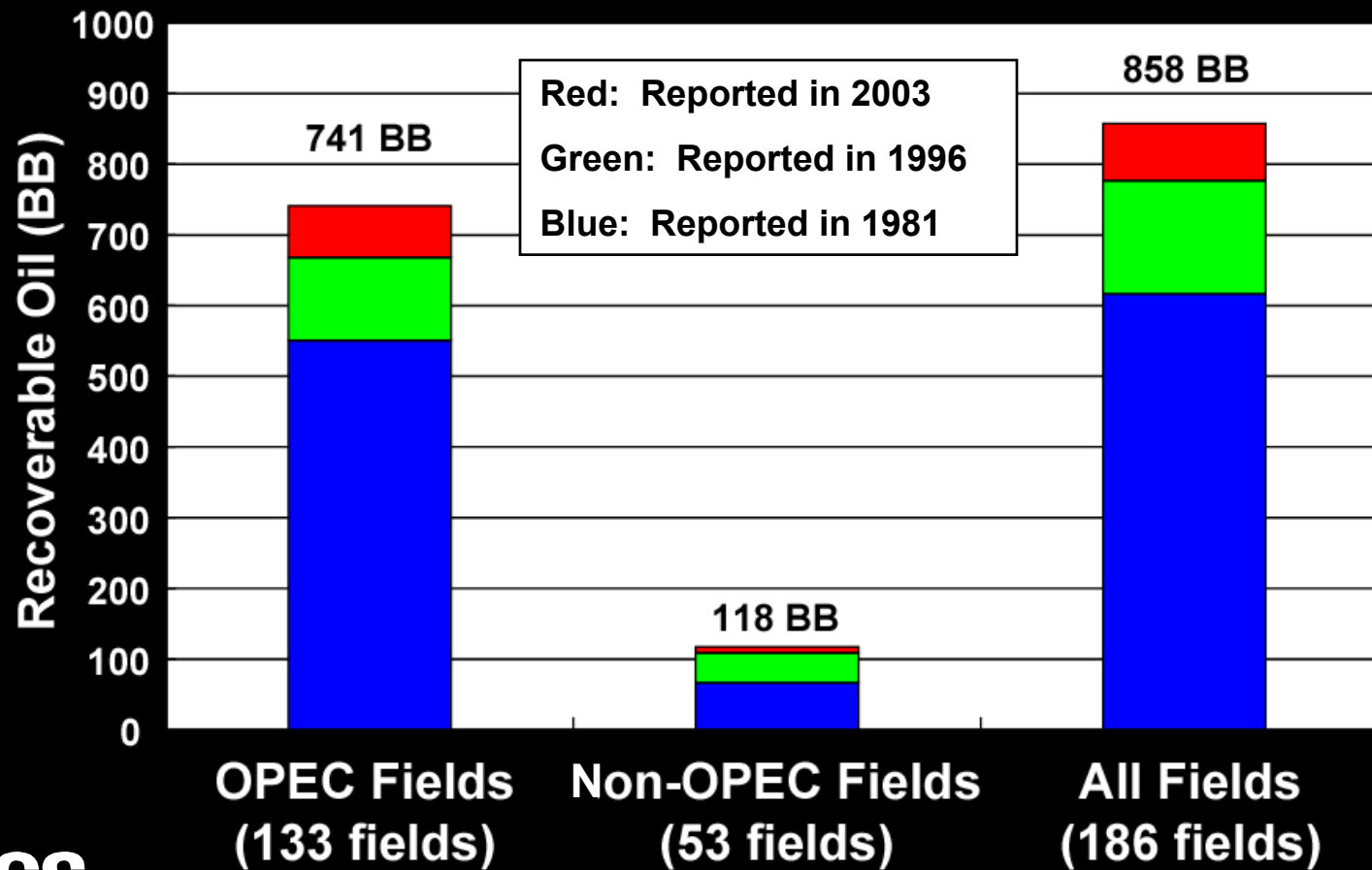


From Klett and Schmoker (2001, 2003); Klett, Charpentier, Schmoker, and Attanasi (2000)

Data from IHS Energy Group (1981 to 2003)

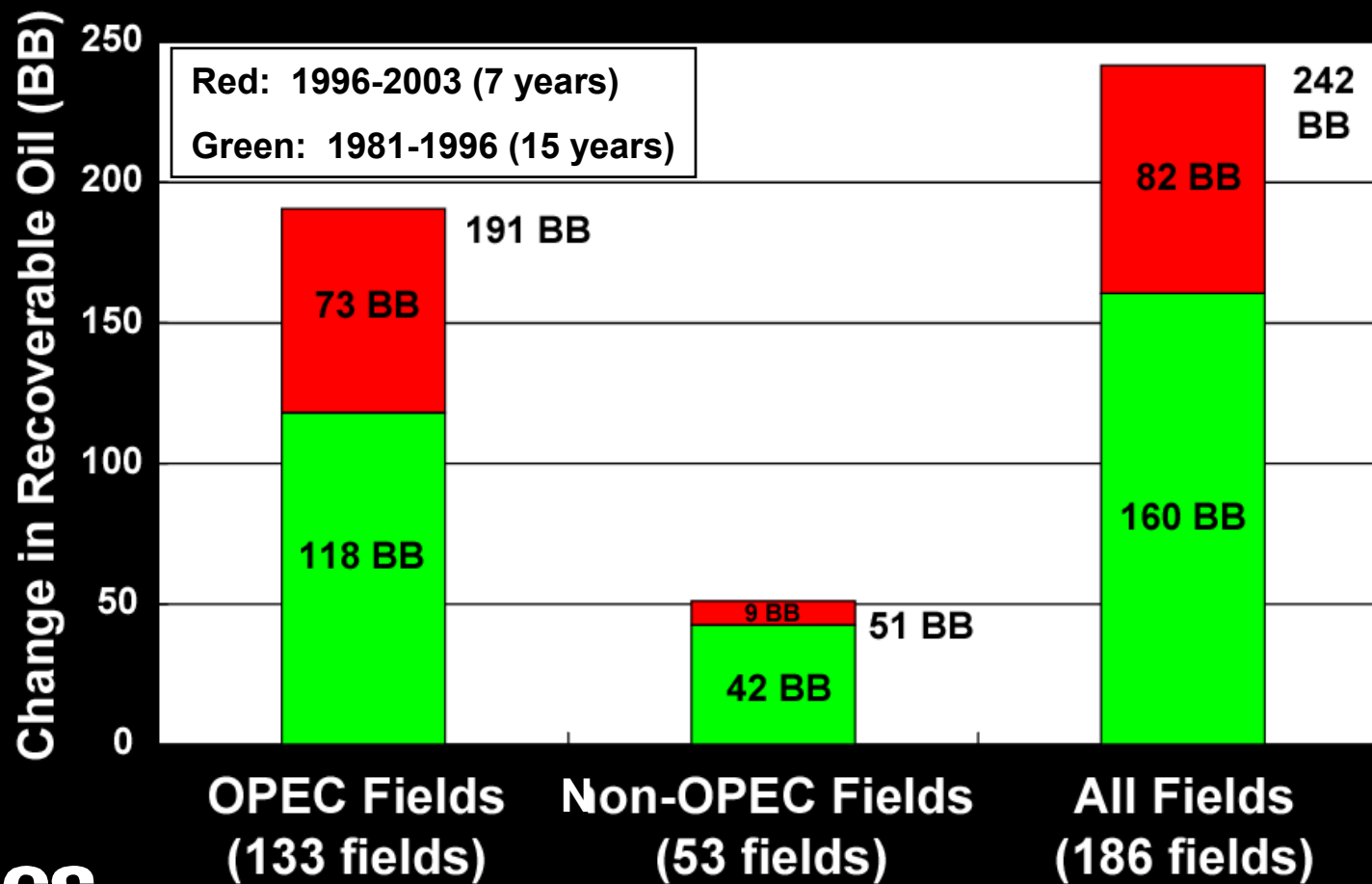
Giant Oil Fields

Reported in 2003 (22 years)



Giant Oil Fields

Net Change 1981-2003

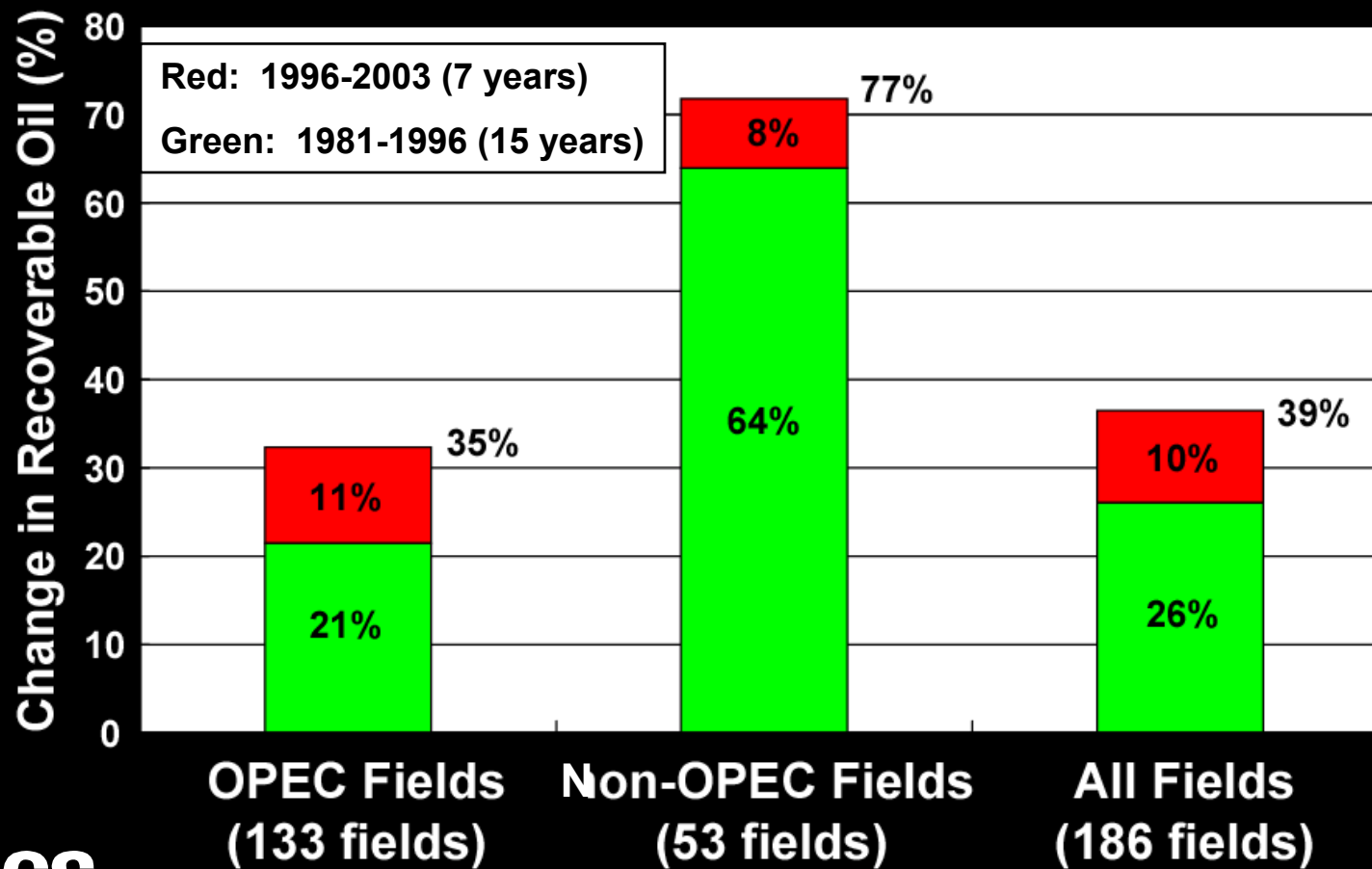


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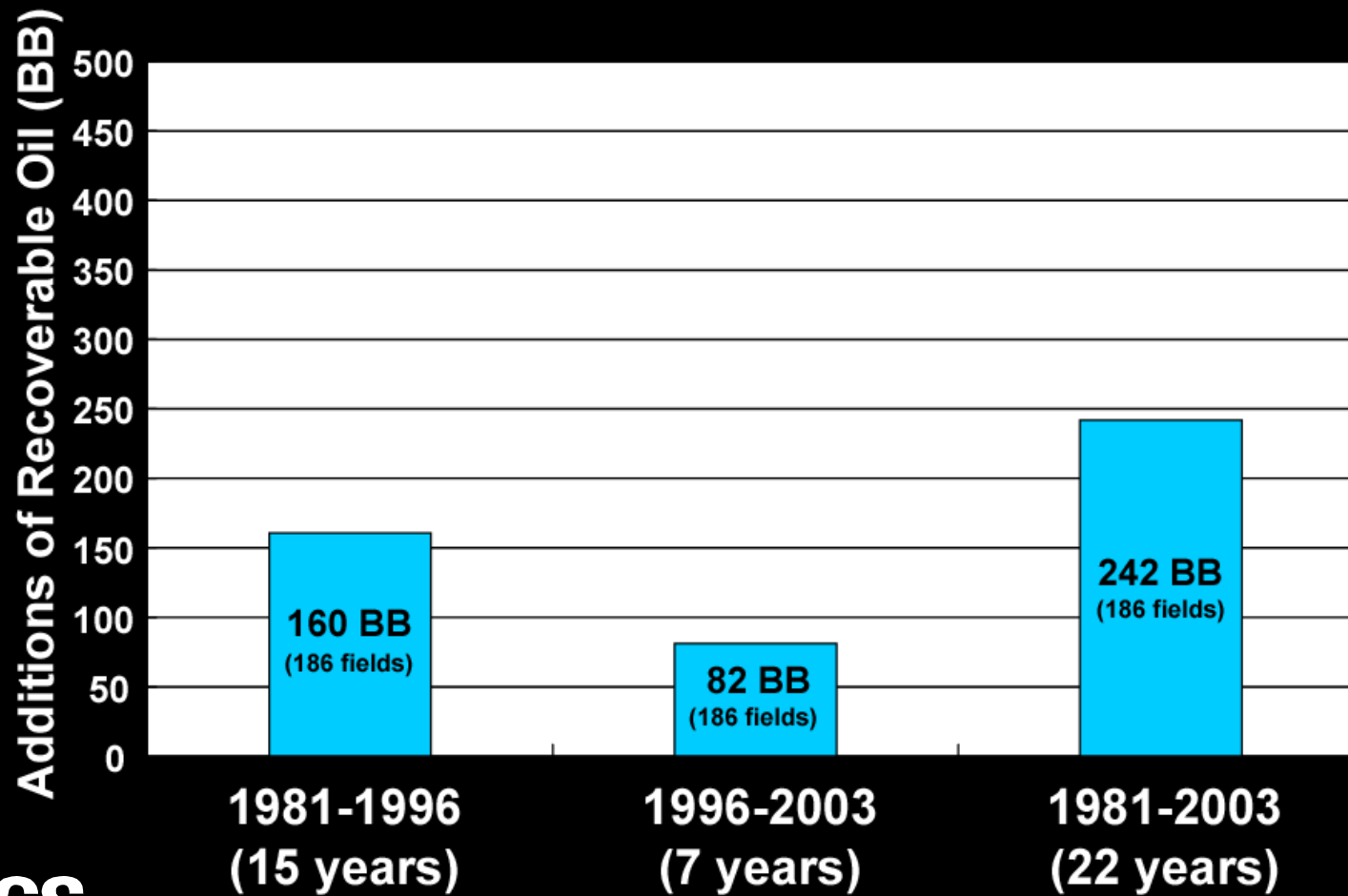
Giant Oil Fields

Percent Change 1981-2003, Reported in 1981



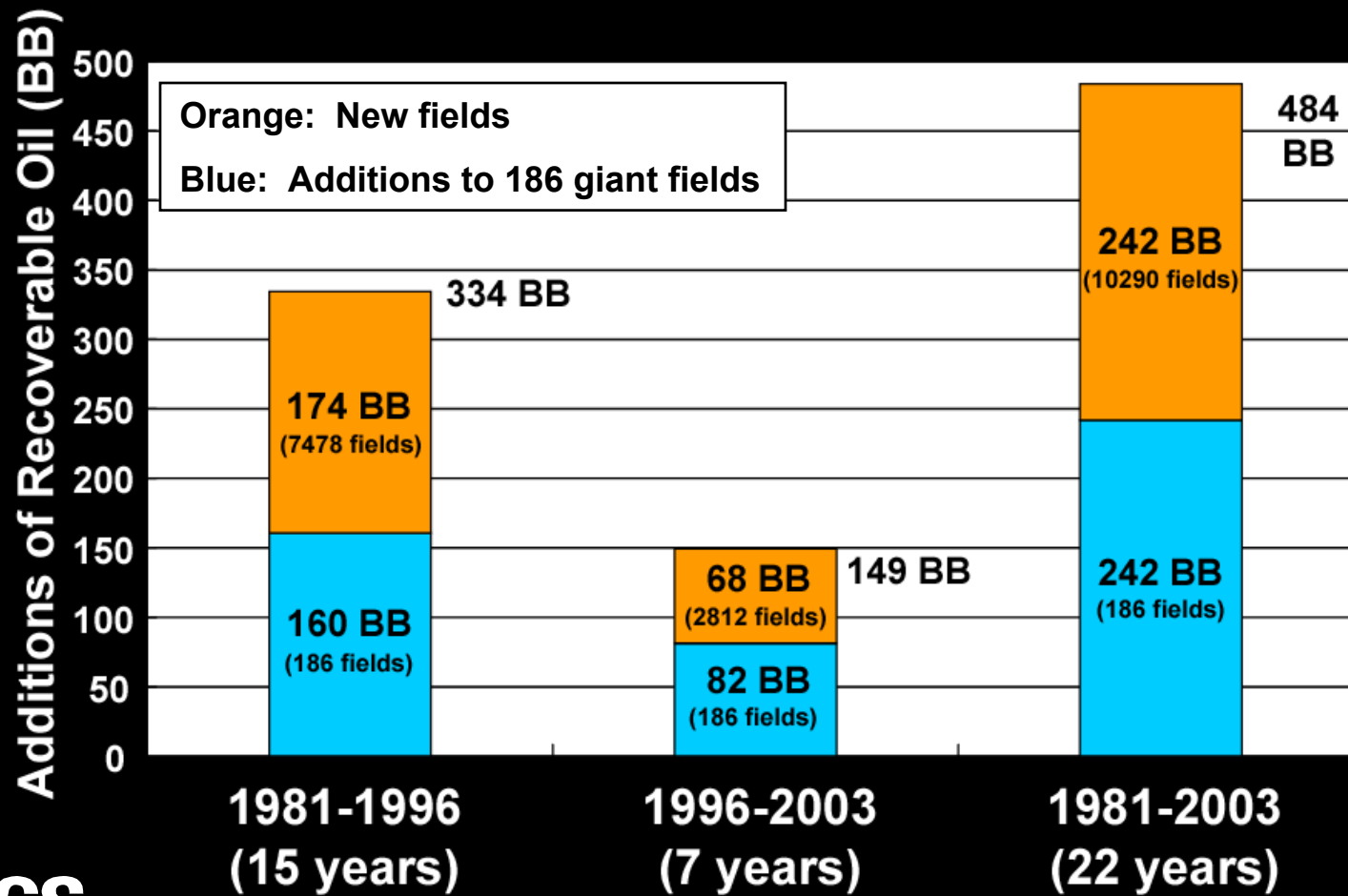
Giant Oil Fields

Additions to Reserves 1981-2003, Reserve Growth



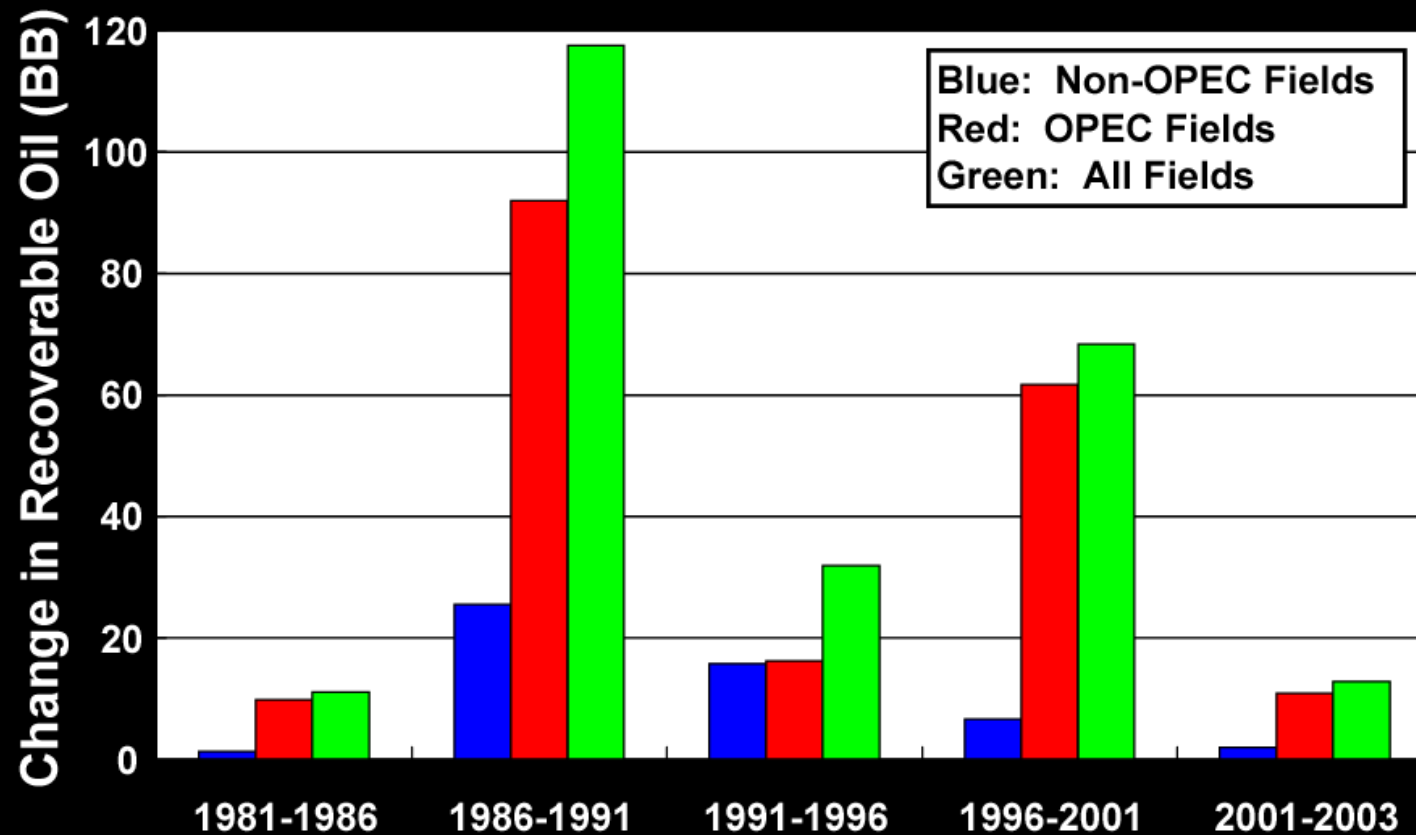
Giant Oil Fields

Additions to Reserves 1981-2003, New Fields



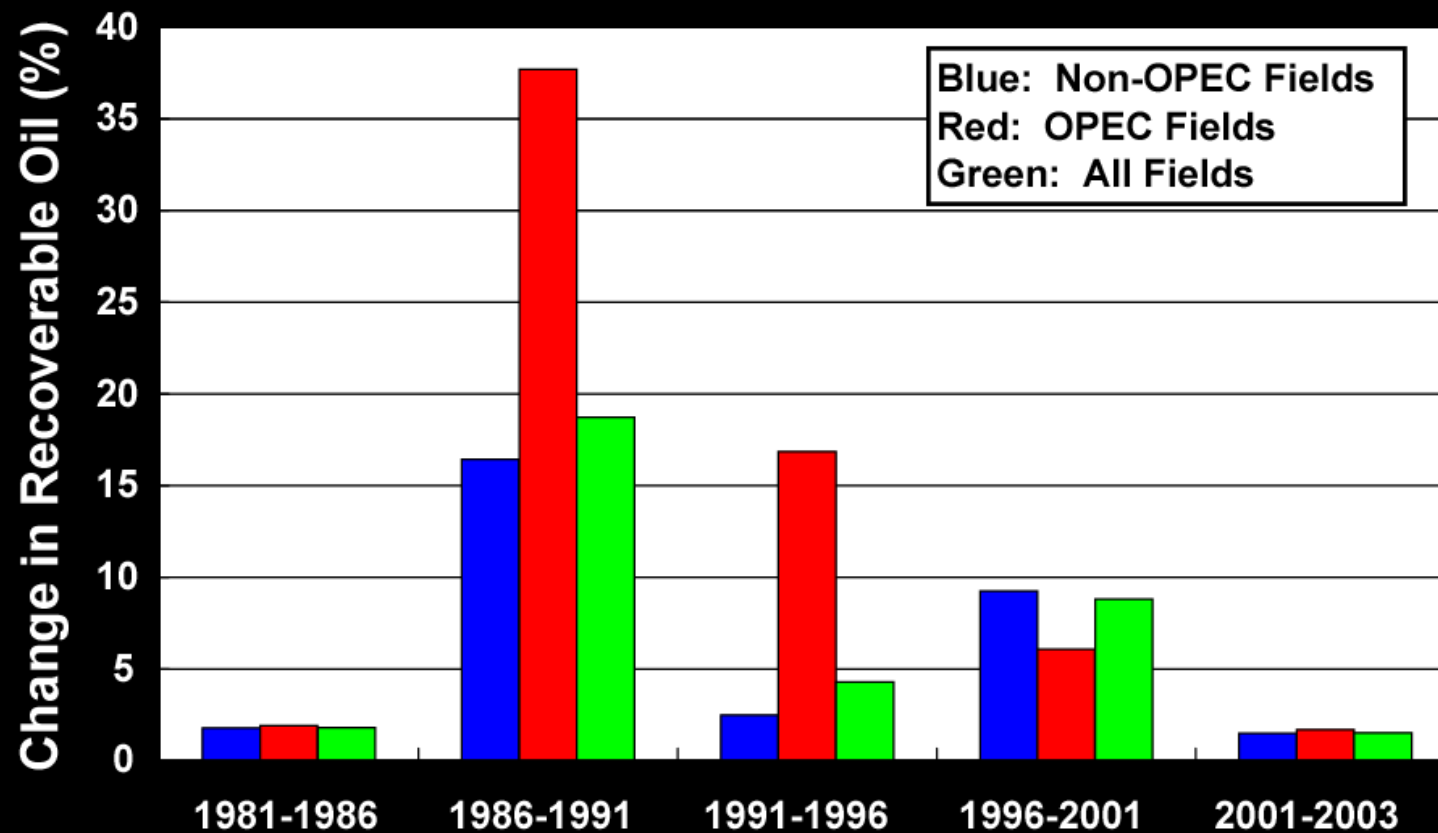
Giant Oil Fields

Change Through Time 1981-2003



Giant Oil Fields

Percent Change Through Time 1981-2003



Conclusions

- Demonstrate use of UNFC
- Large fields, greatest quantities
- Reserve growth is significant
- Maximizing economic recovery

Thank You for Your Attention