

Consumer Energy Alliance

US & Global Oil and Natural Gas

Geological Primer

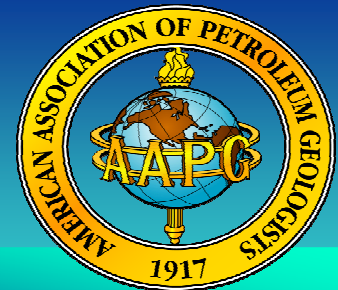
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American Association of Petroleum Geologists
Geoscience & Energy Office
Washington, DC



American Association of Petroleum Geologists

Who We Are!

- **An international professional & science association**
 - Largest professional geological association in the world – 116 countries - >34,000 members
 - Most members live & work in North America
- **Upstream - Academic, private, consulting - Industry professionals -**



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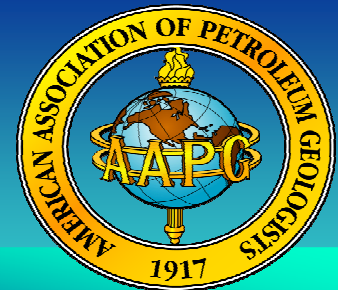
Definitions

- **Resource** = The Endowment
- **Reserves** = What we have discovered & can produce(\$)
- **Production** = Volume that can be extracted in a given time - e.g. millions of barrels per day
- **To convert Resource to Reserves:**
 - Access
 - Technology
 - Investment

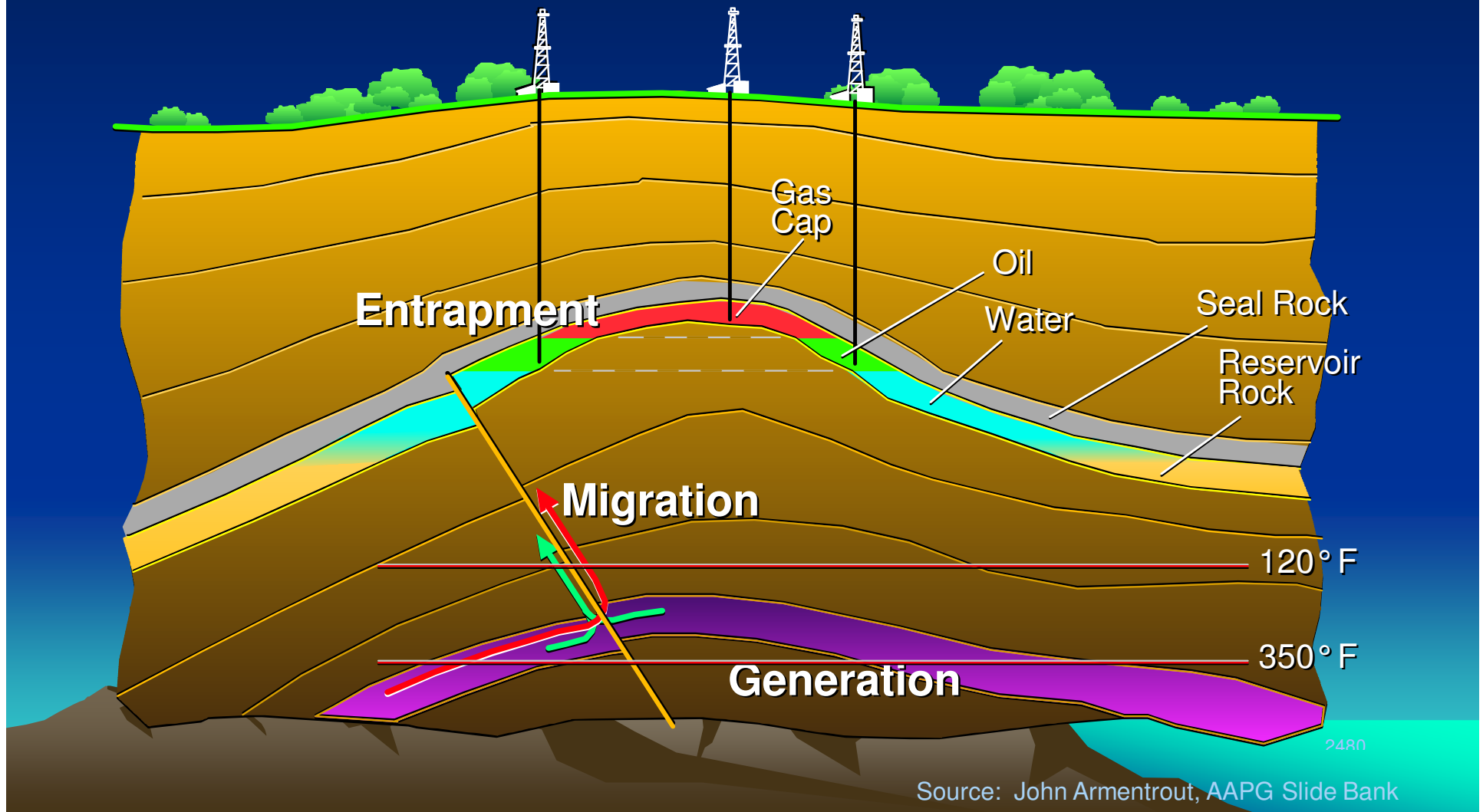


Definitions

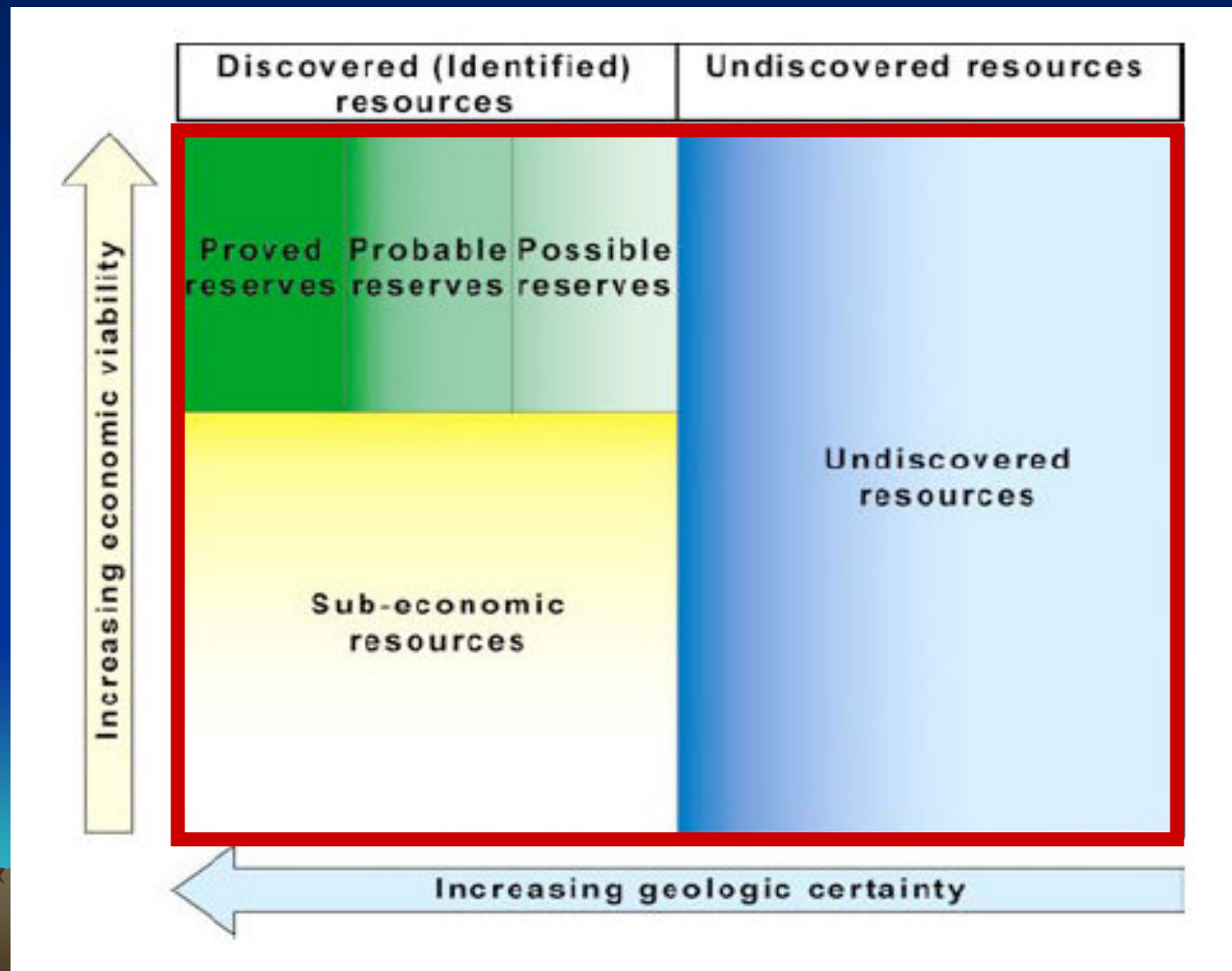
- Conventional Resources – Oil and natural gas in distinct traps*
- Continuous Resources – Oil and natural gas in highly dispersed but extensive (lateral and vertical) systems [e.g., Bakken & Marcellus shales]



Looking at a Petroleum System

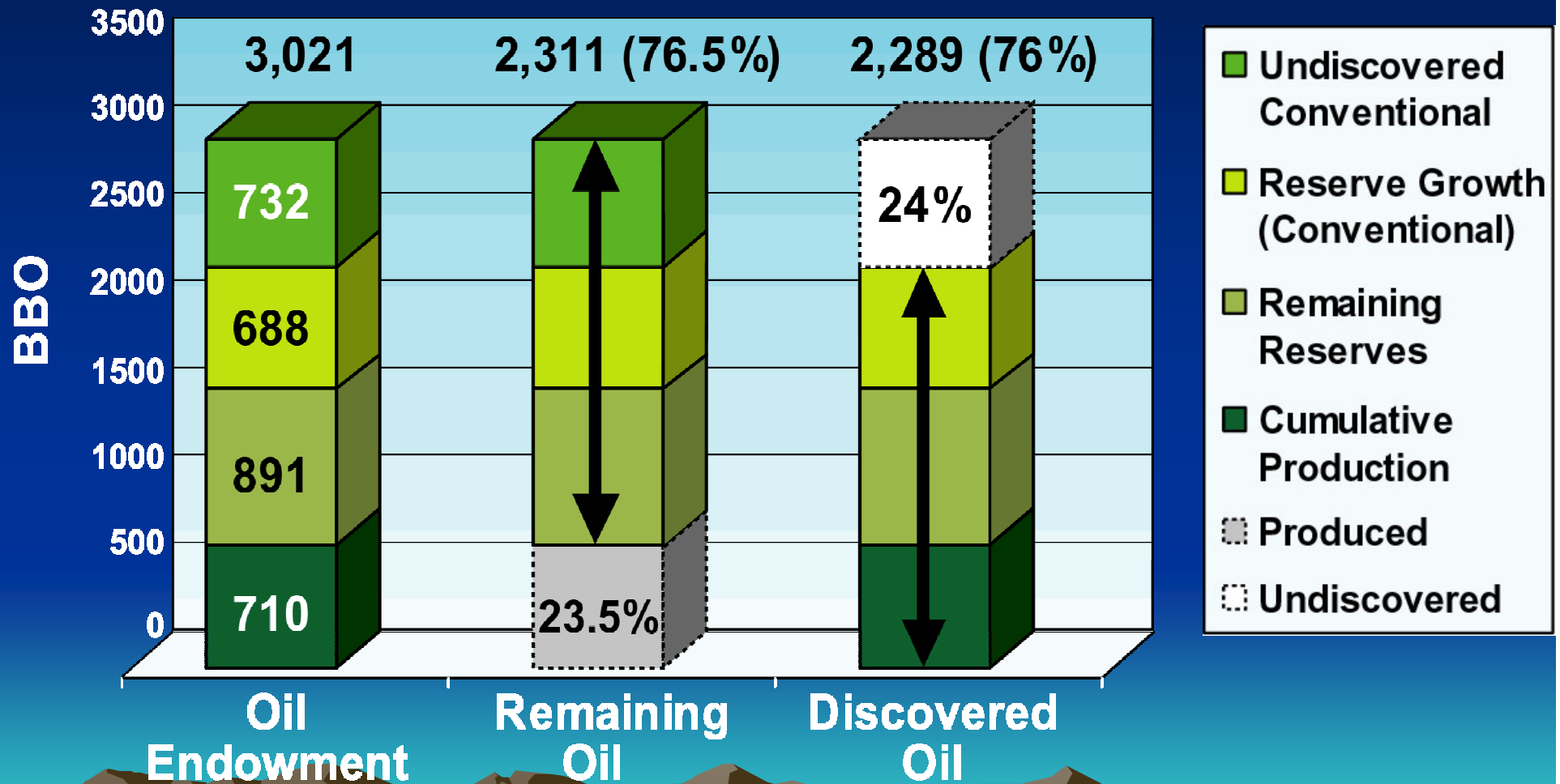


The Resource – Total Endowment



USGS World Petroleum Assessment 2000

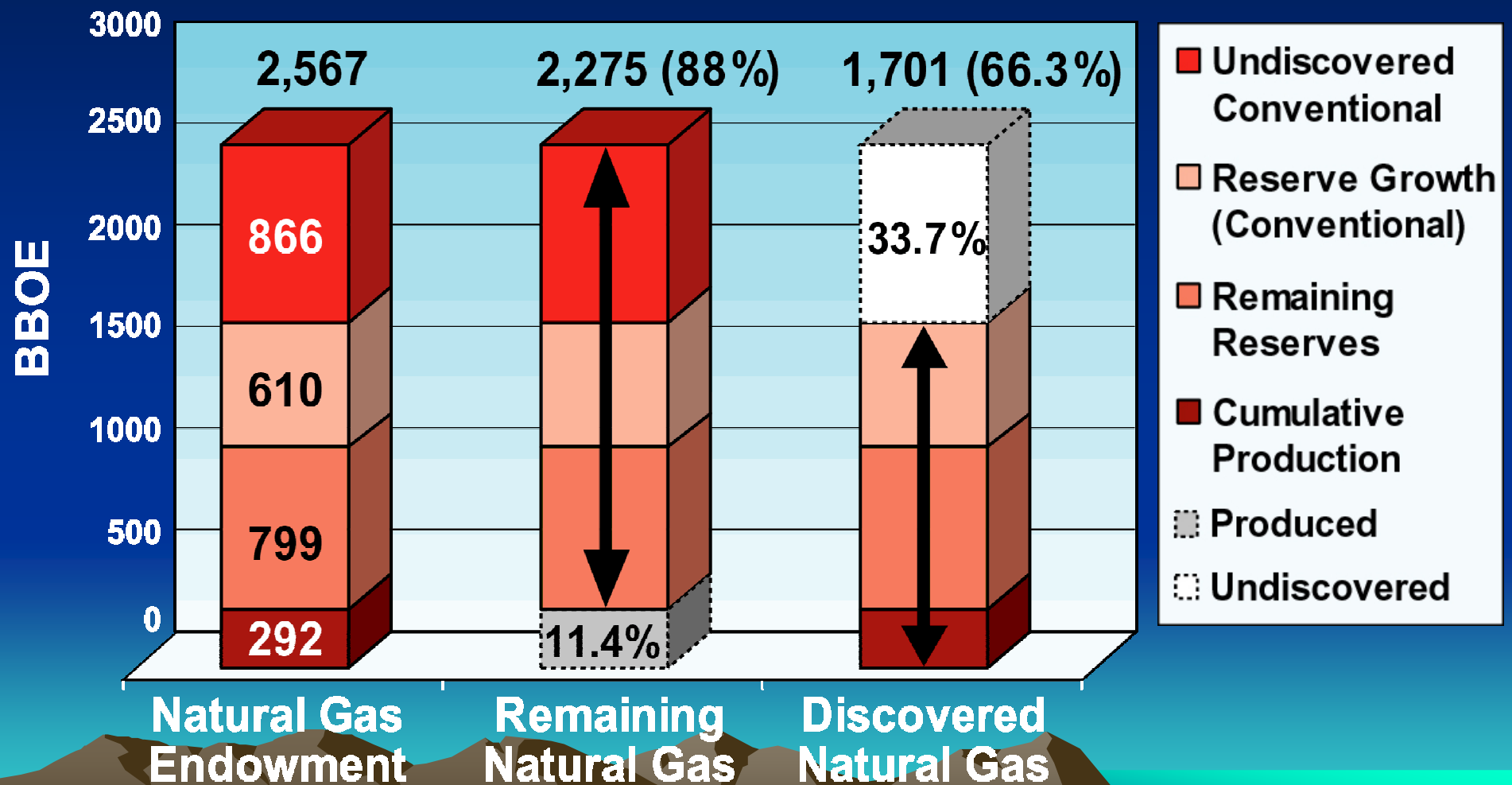
Oil



Source: US Geological Survey

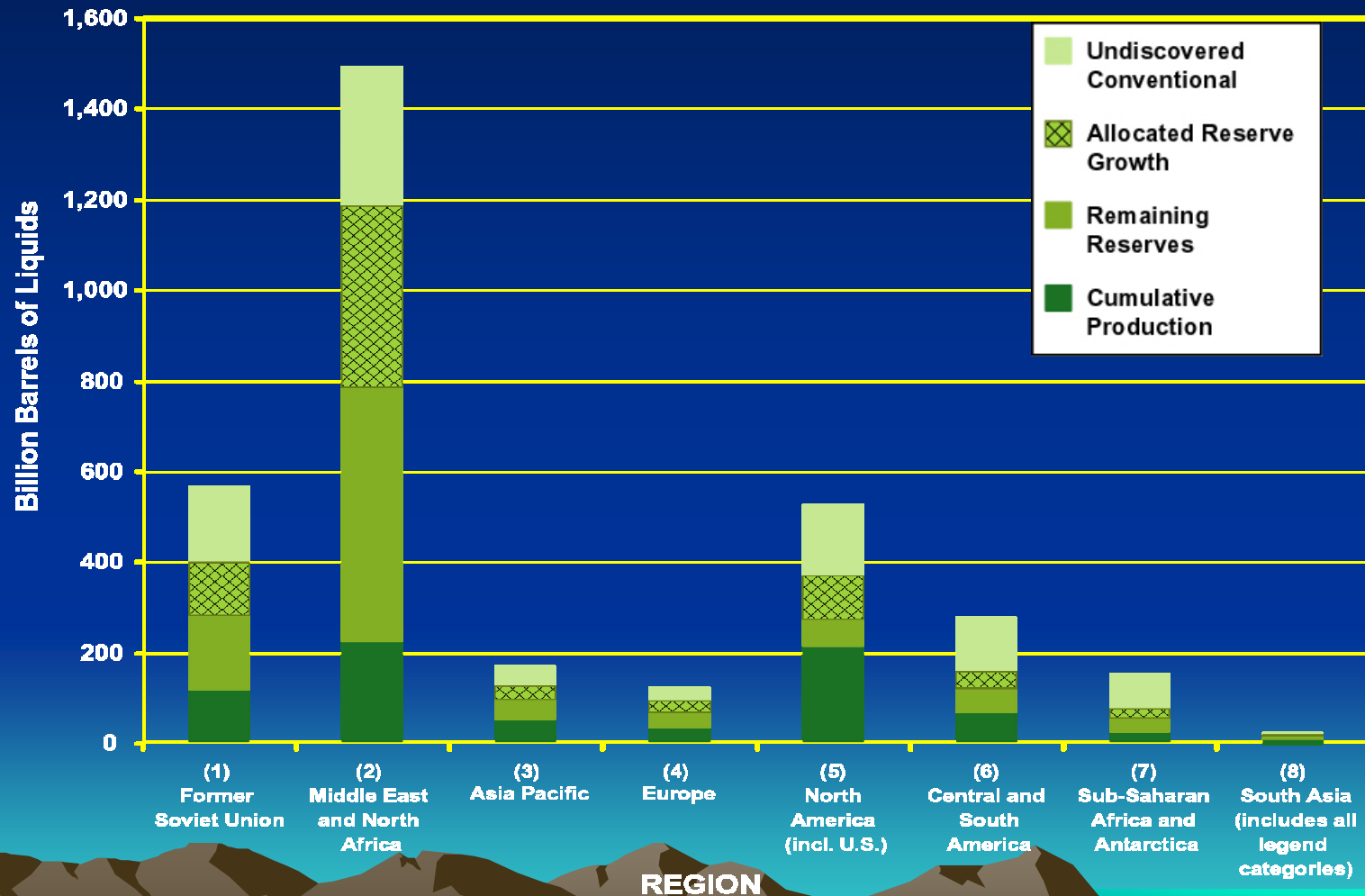
USGS World Petroleum Assessment 2000

Natural Gas



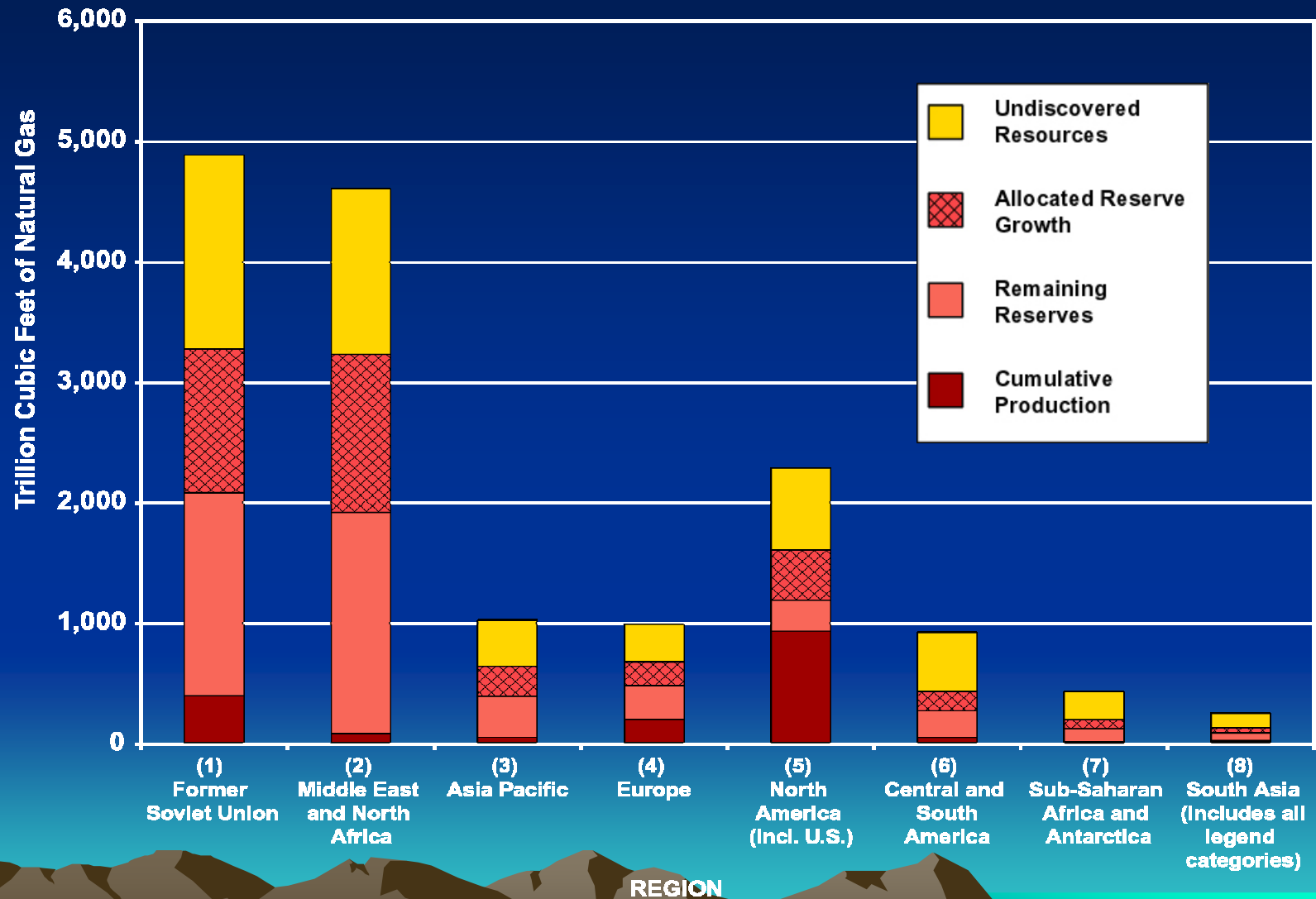
Source: US Geological Survey

Conventional Liquid (Oil and Natural Gas Liquids) Endowment for the Eight Regions of the World, USGS 2000



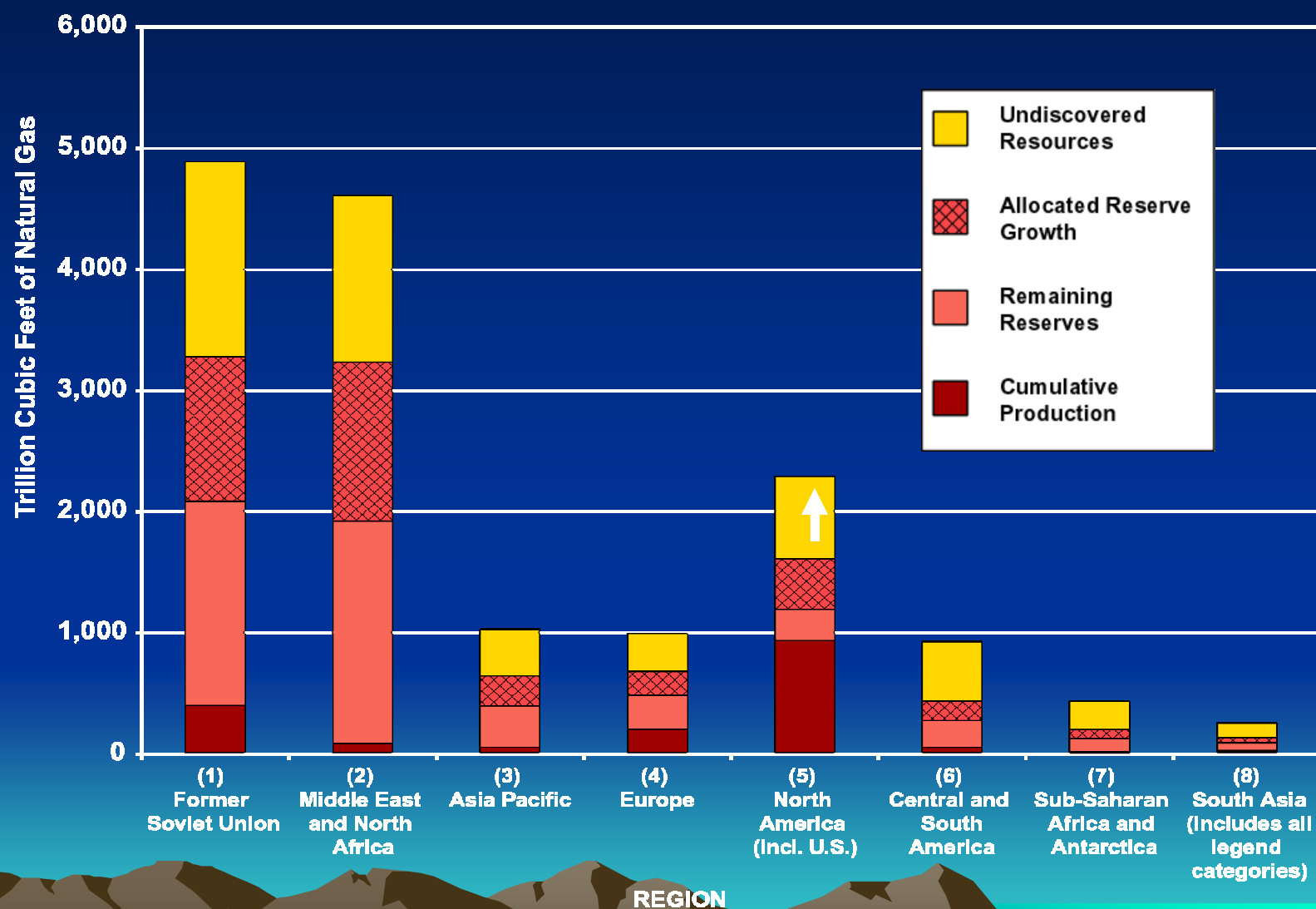
Source: US Geological Survey

Conventional Natural Gas Endowment for the Eight Regions of the World, USGS 2000




Source: US Geological Survey

Conventional Natural Gas Endowment Impact of Continuous Resource Adds



Source: US Geological Survey

Top Ten Global Oil Reserves 2007

Oil					
Proved reserves	At end 1987	At end 1997	At end 2006	At end 2007	
	Thousand million barrels	Thousand million barrels	Thousand million barrels	Thousand million barrels	Share of total
Saudi Arabia	169.6	261.5	264.3	264.2	21.3%
Iran	92.9	92.6	138.4	138.4	11.2%
Iraq	100.0	112.5	115.0	115.0	9.3%
Kuwait	94.5	96.5	101.5	101.5	8.2%
United Arab Emirates	98.1	97.8	97.8	97.8	7.9%
Venezuela	58.1	74.9	87.0	87.0	7.0%
Russian Federation	n/a	n/a	79.3	79.4	6.4%
Libya	22.8	29.5	41.5	41.5	3.3%
Kazakhstan	n/a	n/a	39.8	39.8	3.2%
Nigeria	16.0	20.8	36.2	36.2	2.9%
Top 10	652.0	786.1	1000.8	1000.80	80.7%

Source: EPRasheed & BP Statistical Review of Proved Reserves year end 2007

The Promise!

- Oil and Natural Gas Resource – Endowment is robust – potential to meet large future demand
- Policy (Access, Investment climate, and technology availability are critical)
- Need to use energy in rational manner and make national commitments to a course that prepares for future needs.

