

Figure 1. US Army Battlefield Logistical Demands  
(Adapted from Valdes<sup>1</sup>)

<sup>1</sup> James J. Valdes, “Biotechnology Executive Roundtable,” presentation to GEN Paul J. Kern, Commander, US Army Materiel Command, undated.

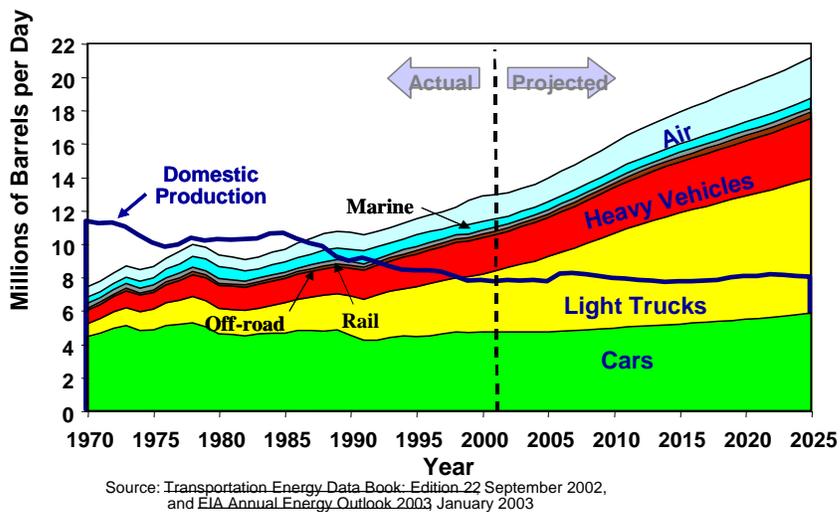


Figure 2. Actual and Projected U.S. Petroleum Consumption by Vehicle Type

For transportation only. U.S. consumption exceeded domestic production in the mid 1980's and will continue to rise to nearly 70% by 2025.

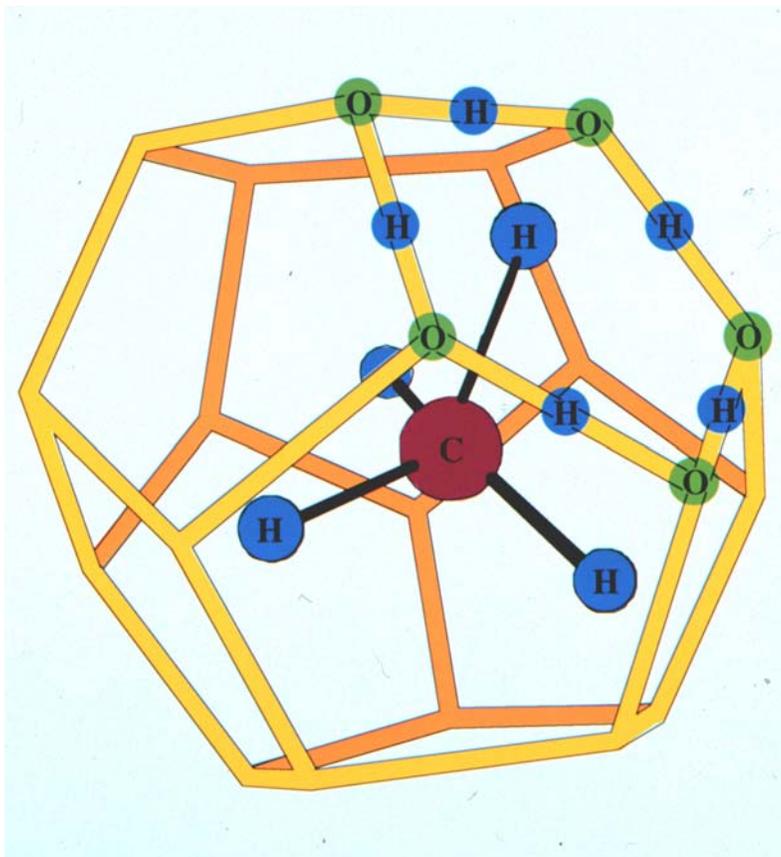


Figure 3. Diagrammatic Concept of a Structure I Gas Hydrate Cage Holding a Methane Molecule

H, O, and C represent hydrogen, oxygen and carbon atoms. Double lines, filled or unfilled, represent chemical bonds.

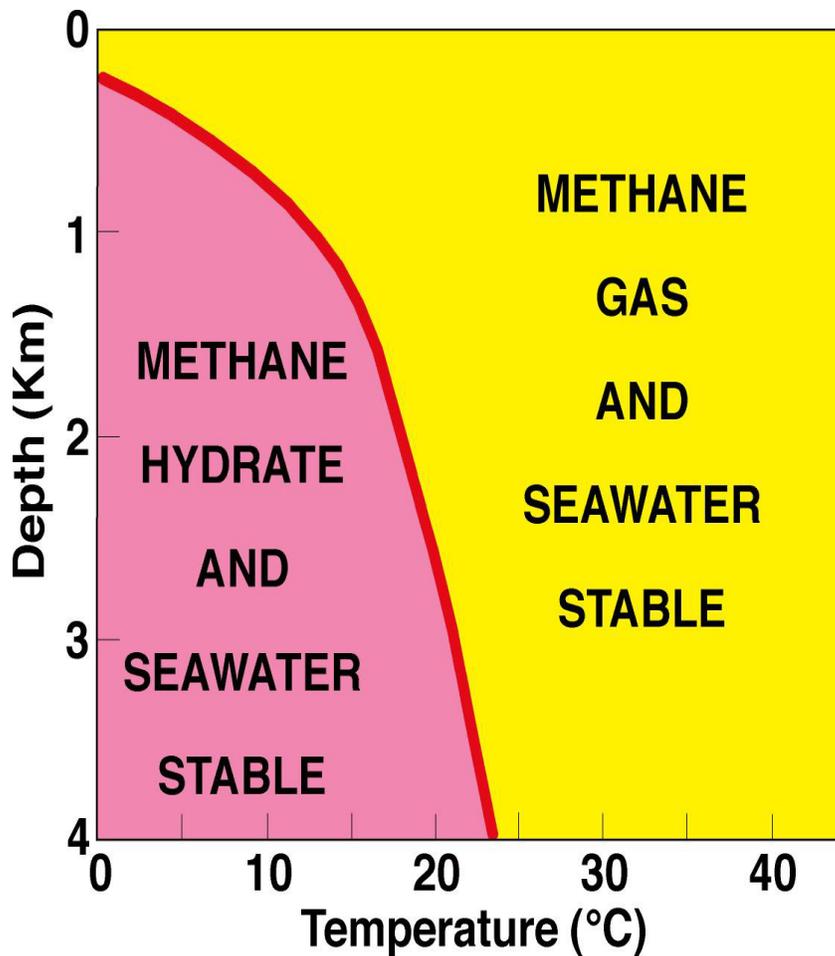


Figure 4. Phase Boundary of Methane Hydrate in the Ocean (solid line)

The pressure axis has been converted to depth into the ocean, so pressure increases downward.

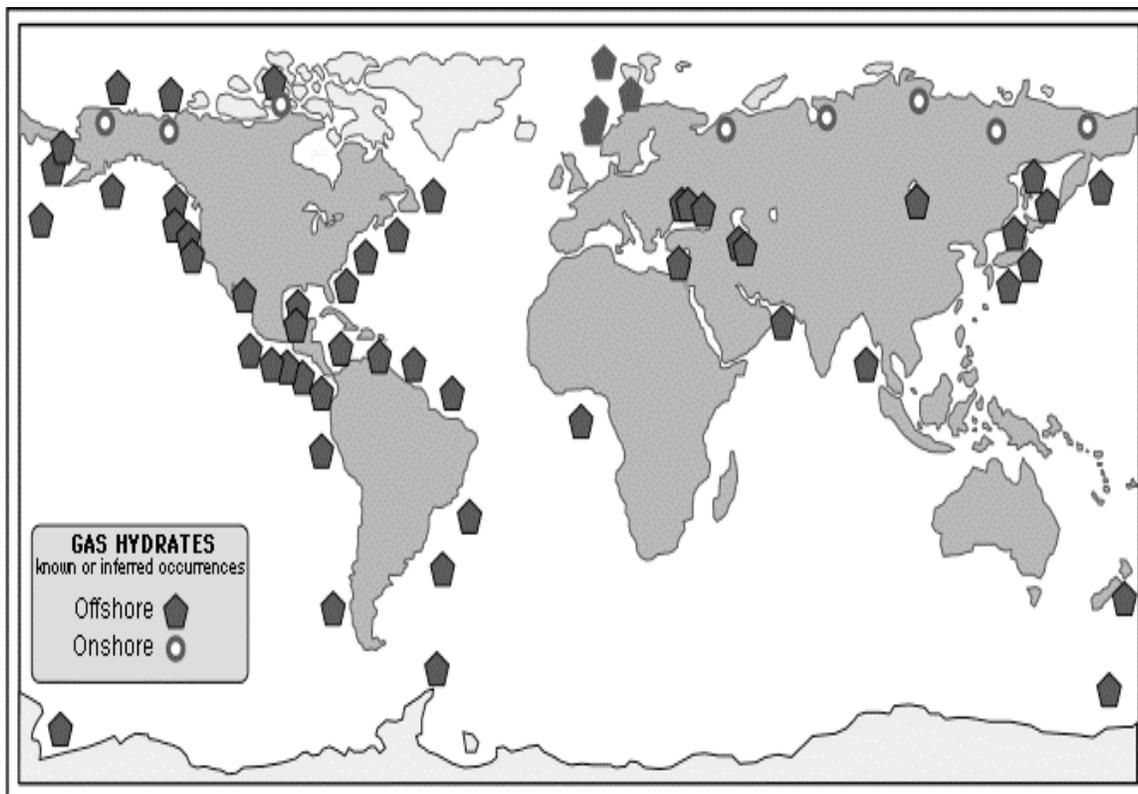


Figure 5. Global Distribution of Confirmed or Inferred Gas Hydrate Sites, 1997 (courtesy of James Booth, U.S. Geological Survey). This information represents our very limited knowledge. Gas hydrate probably is present in essentially all continental margins.

### Energy Consumption vs. Wealth

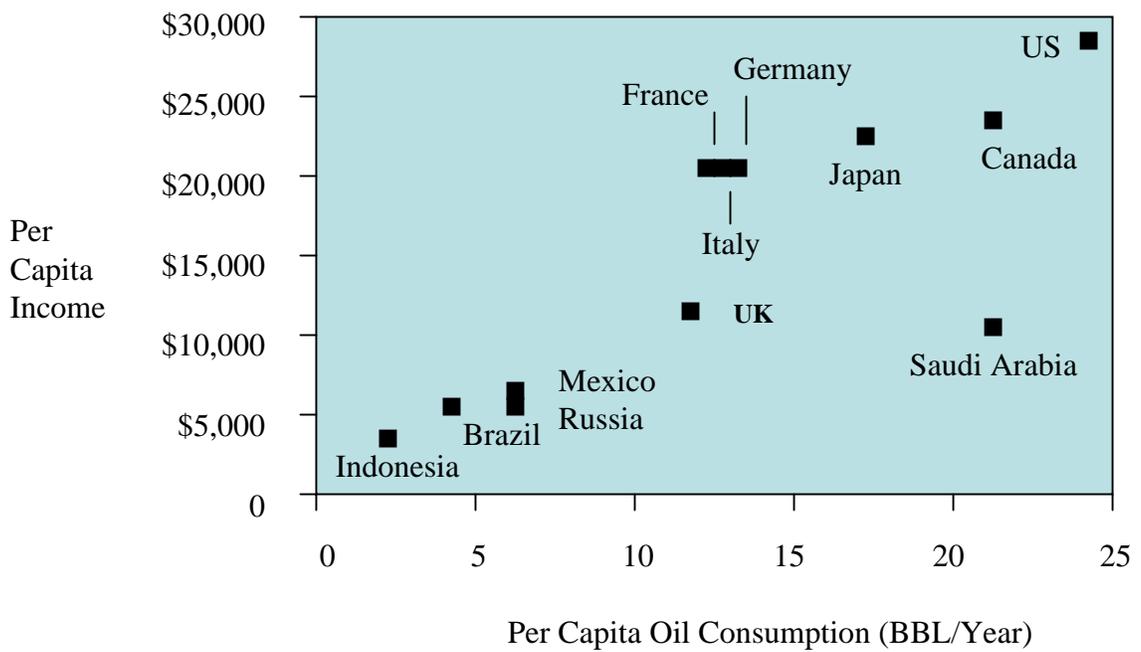


Figure 6. Global View of Future Energy Resource and Demand

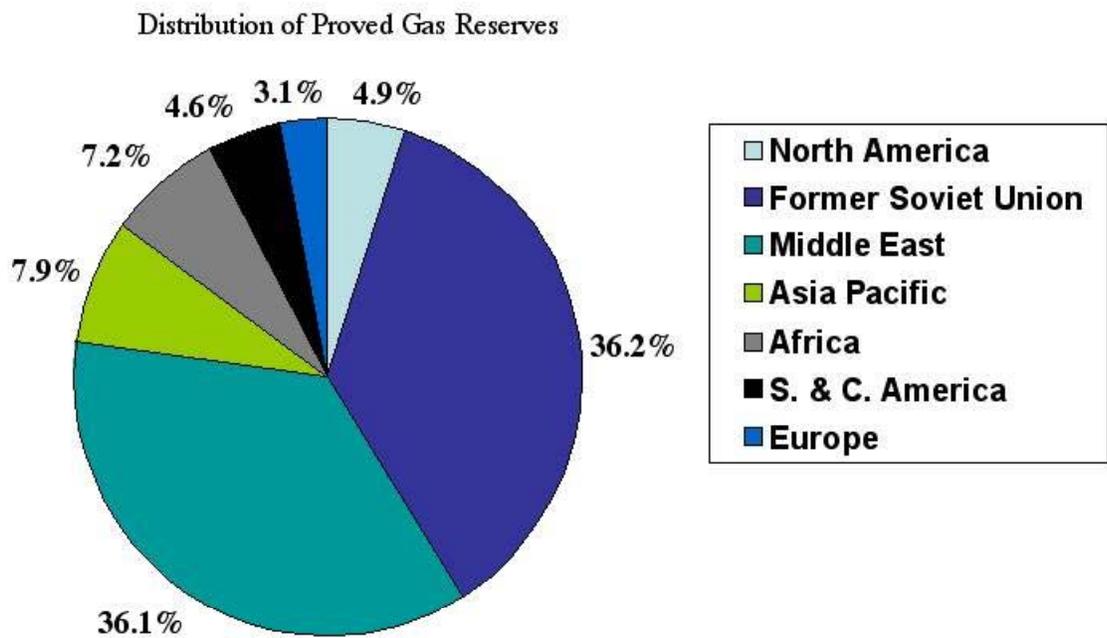
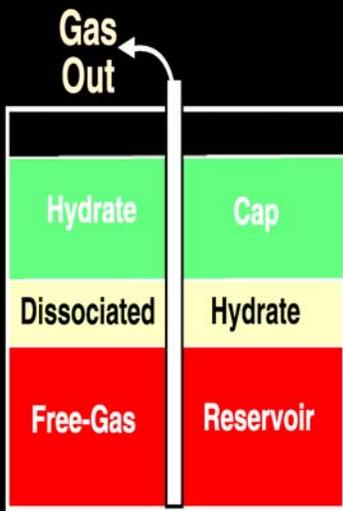


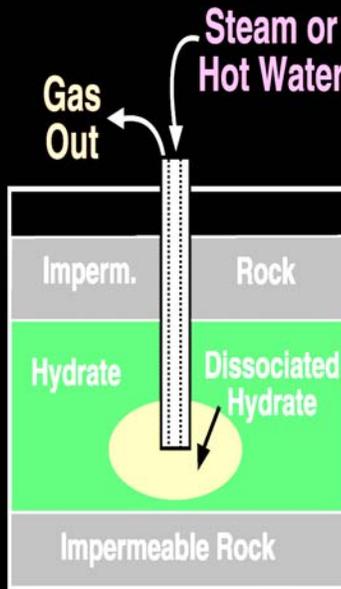
Figure 7. Global Distribution of Gas Reserves

# Gas Hydrate Production Methods

## Depressurization



## Thermal Injection



## Inhibitor Injection

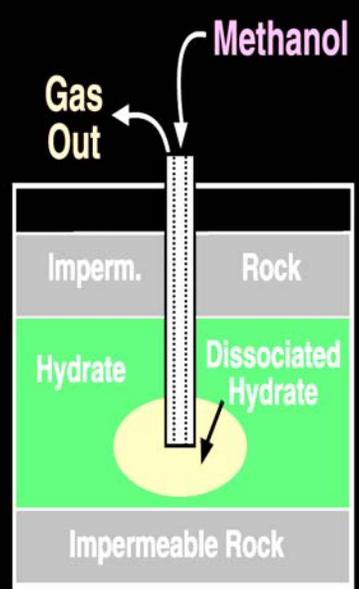
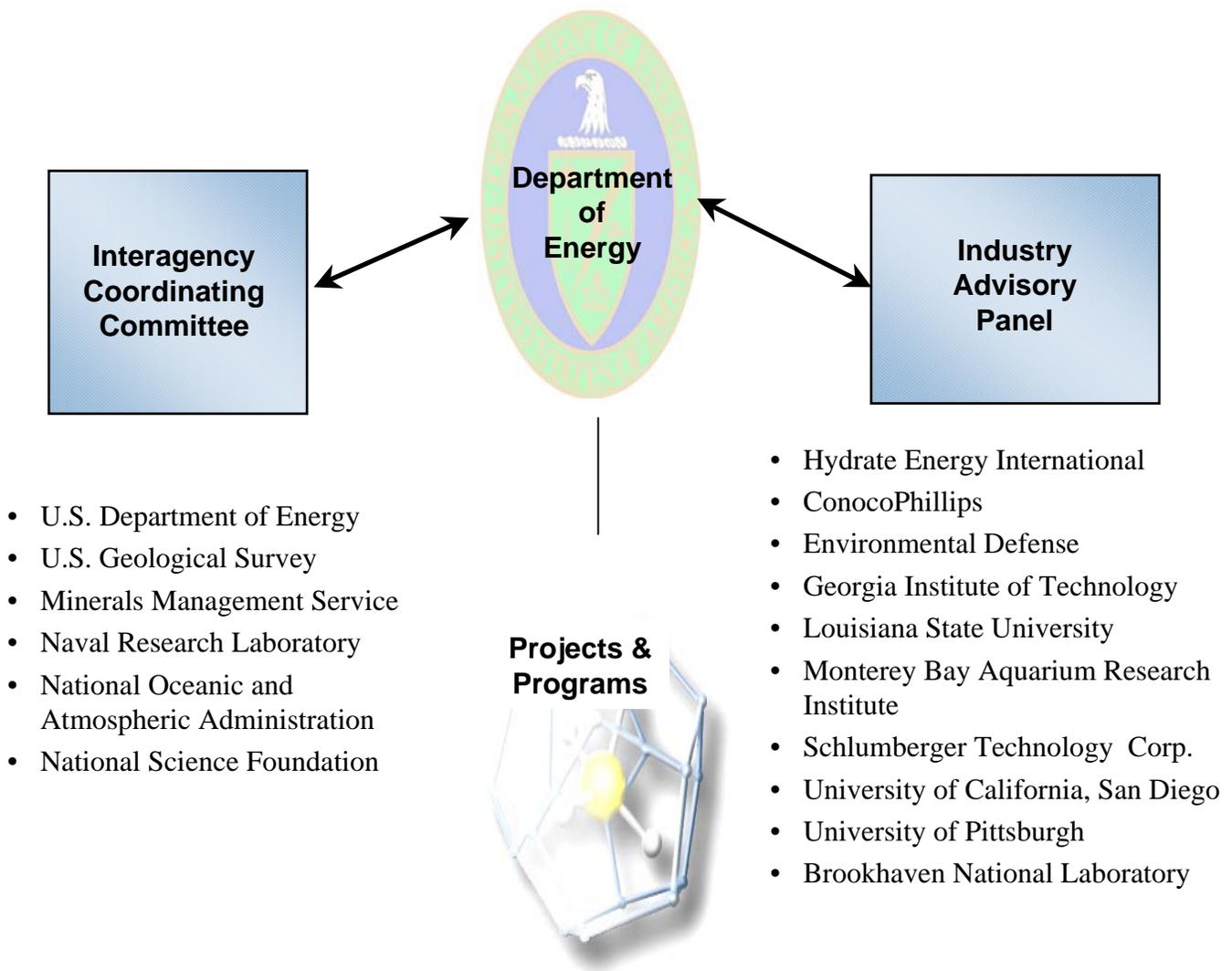


Figure 8. Approaches to Gas Extraction



*Based on Methane Hydrates Act of 2000*

Figure 9. National Methane Hydrates R&D Program

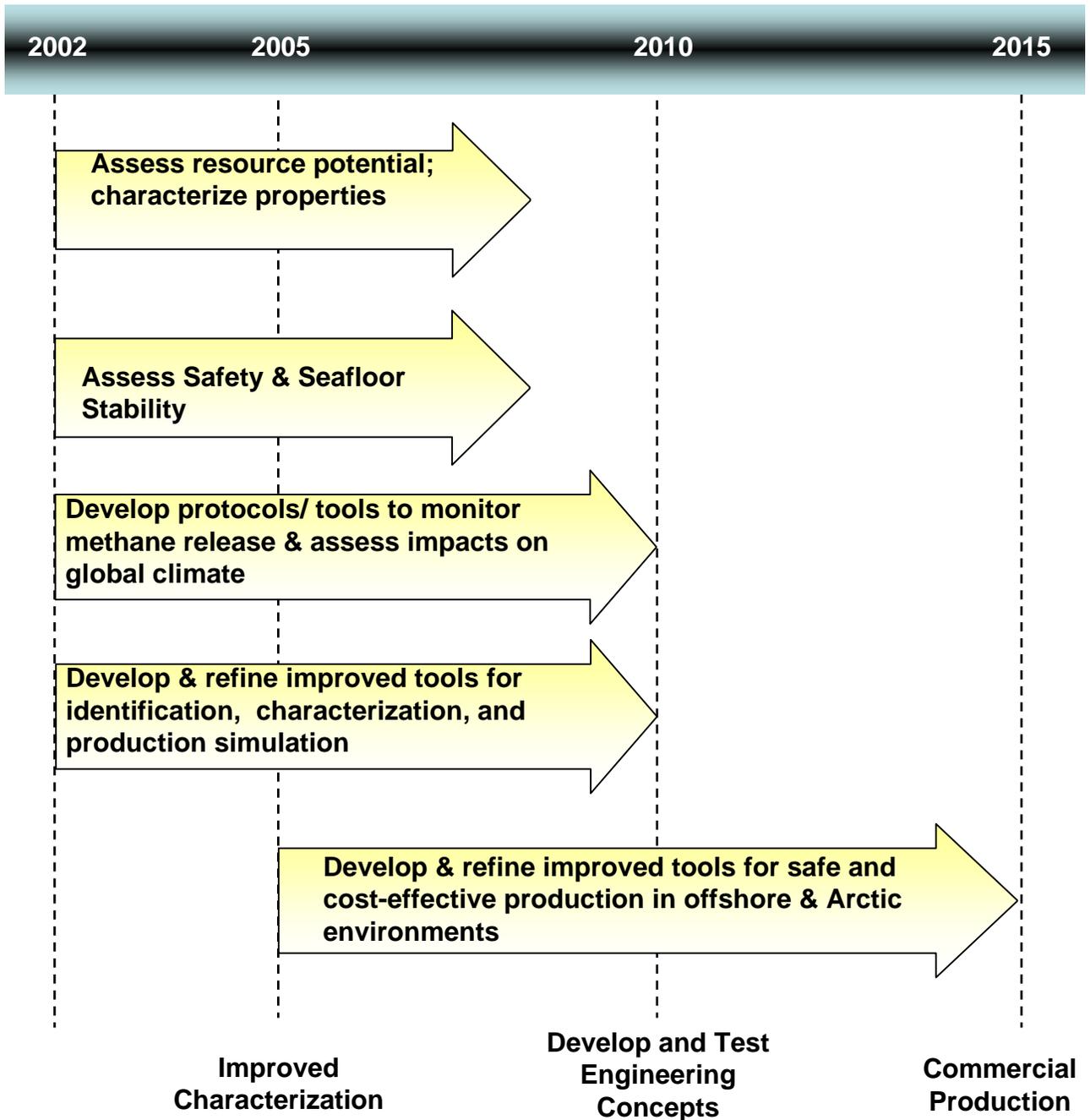


Figure 10. Methane Hydrate Technology Road Map

## Years of Supply at 1996 Consumption levels

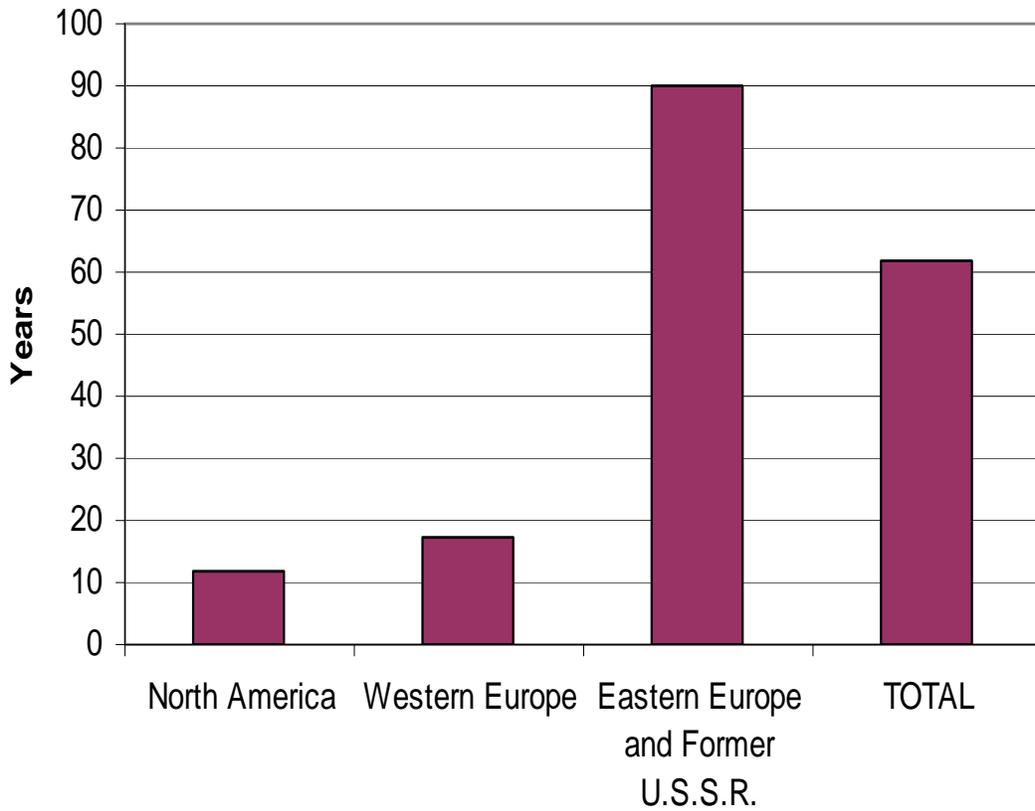


Figure 11. Years of Natural Gas Supply at 1996 Consumption Levels

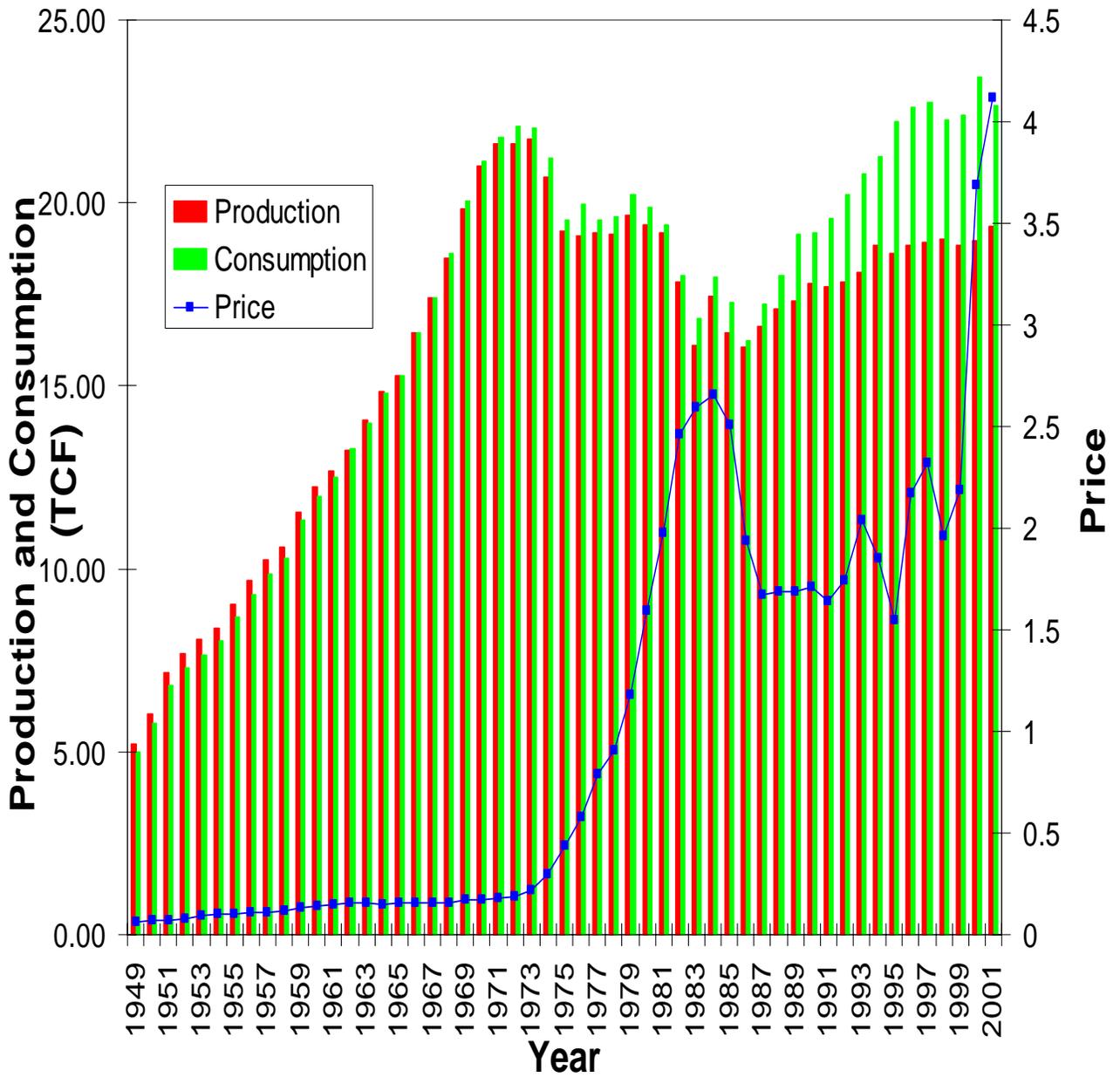


Figure 12. U.S. Natural Gas Price and Consumption.

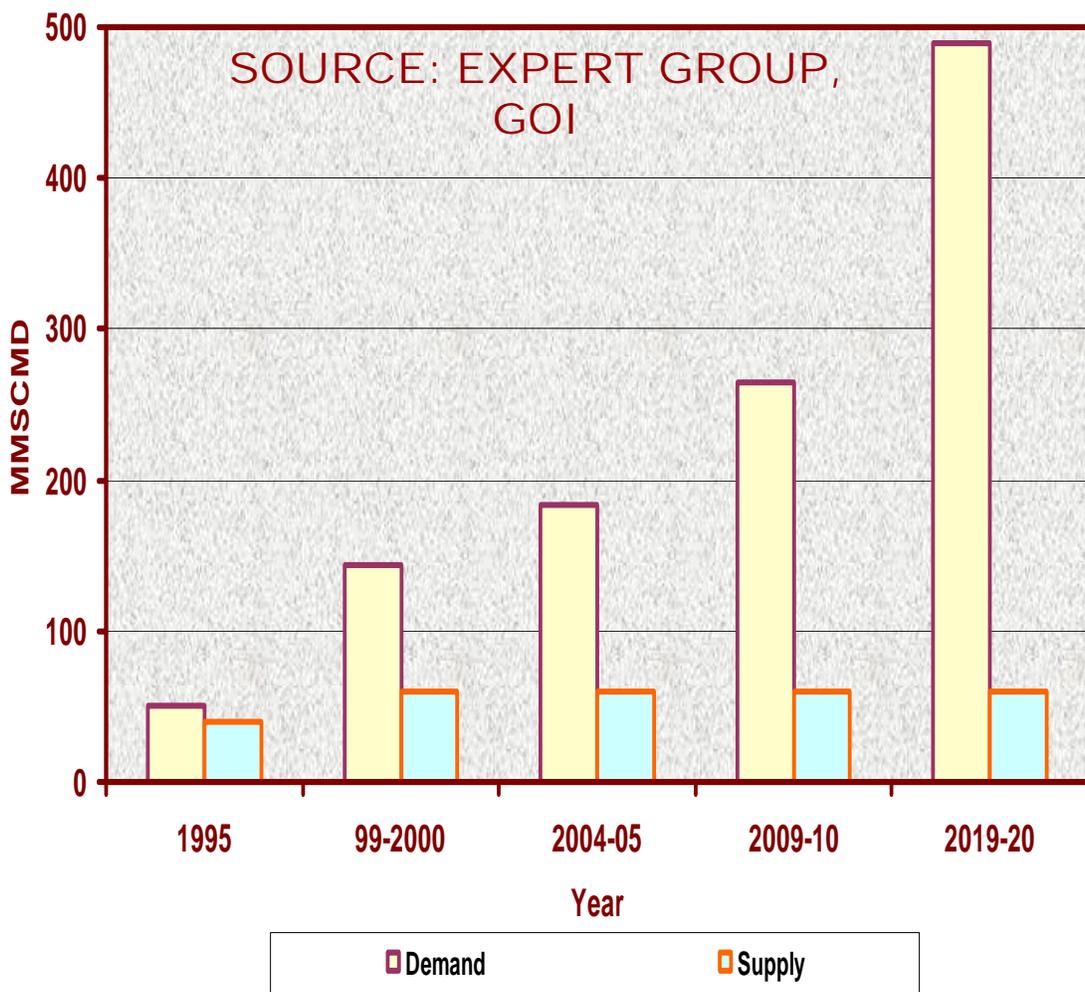


Figure 13. Natural Gas Demand and Supply in India

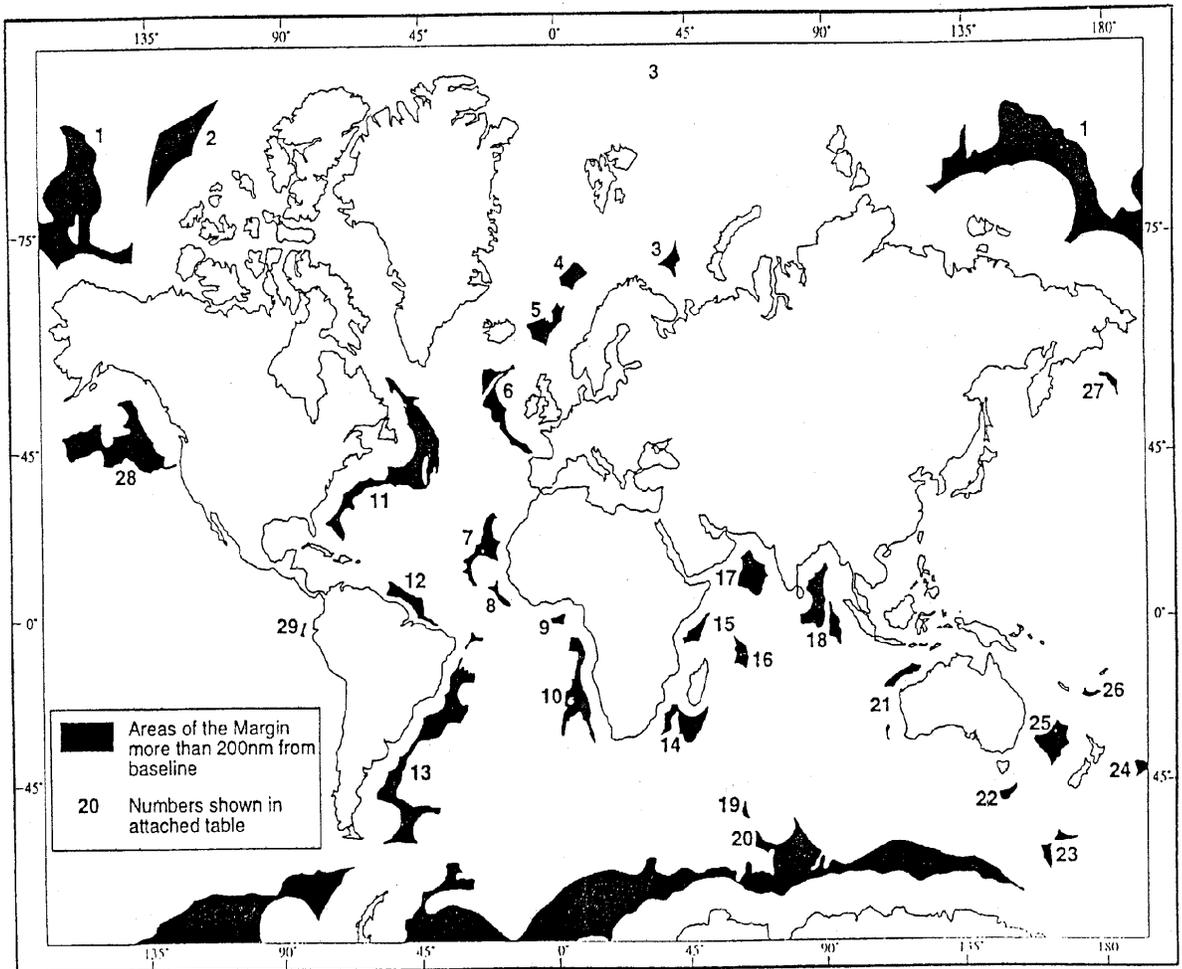


Figure14. Global View of the Continental Margins beyond 200 Nautical Miles from Baseline

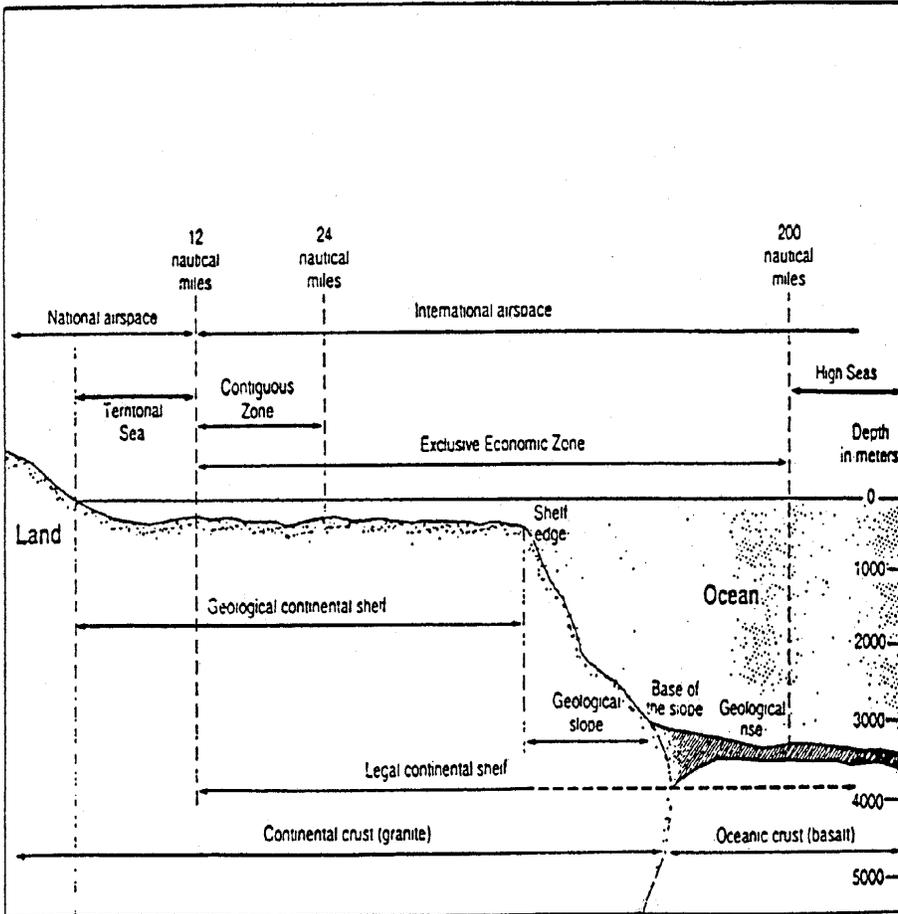


Figure The Legal Regimes and Geomorphic Regions

Figure 15. Legal Regimes and Geomorphic Regions