North Carolina Governor's Scientific Advisory Panel on Offshore Energy

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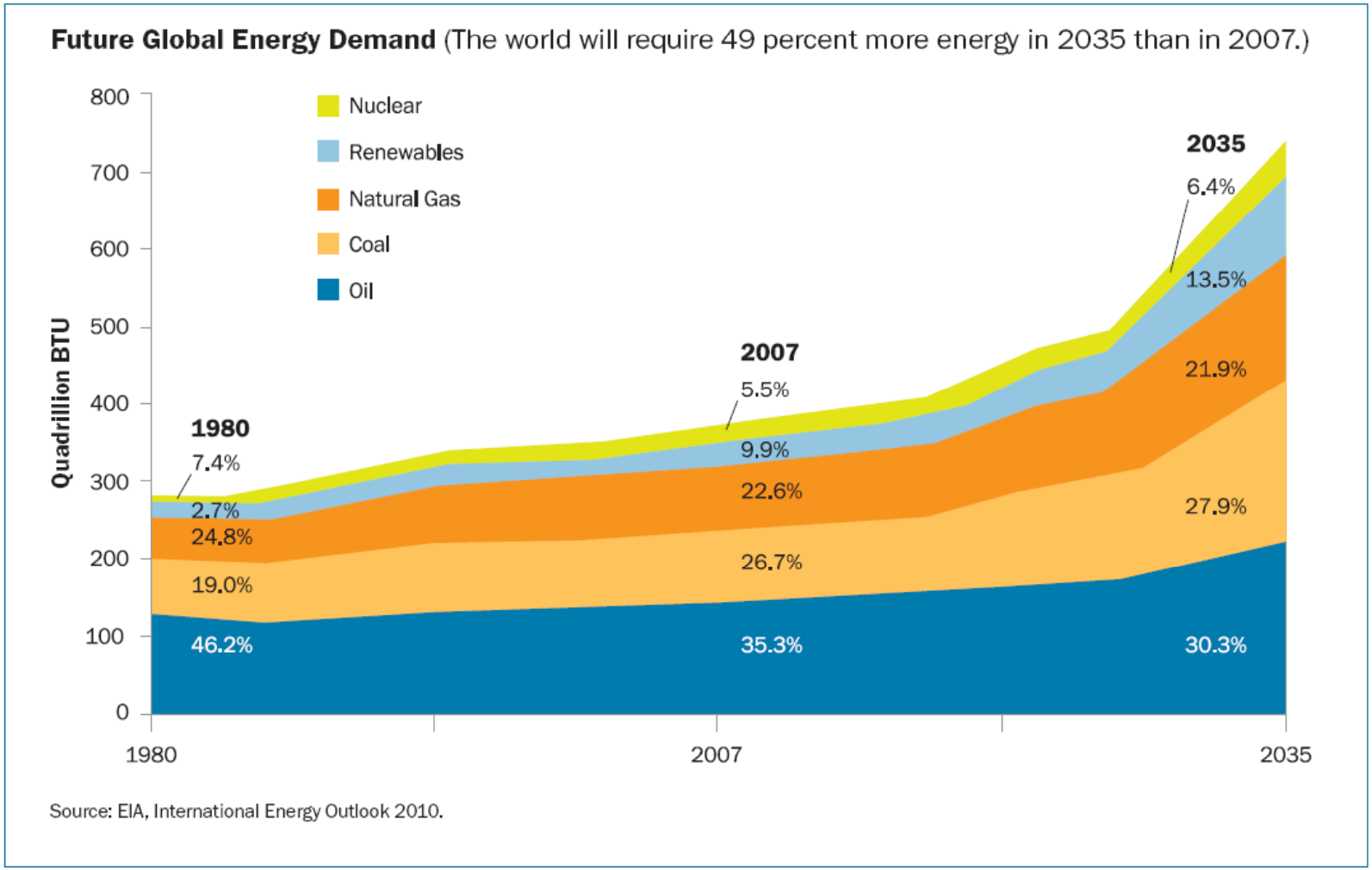
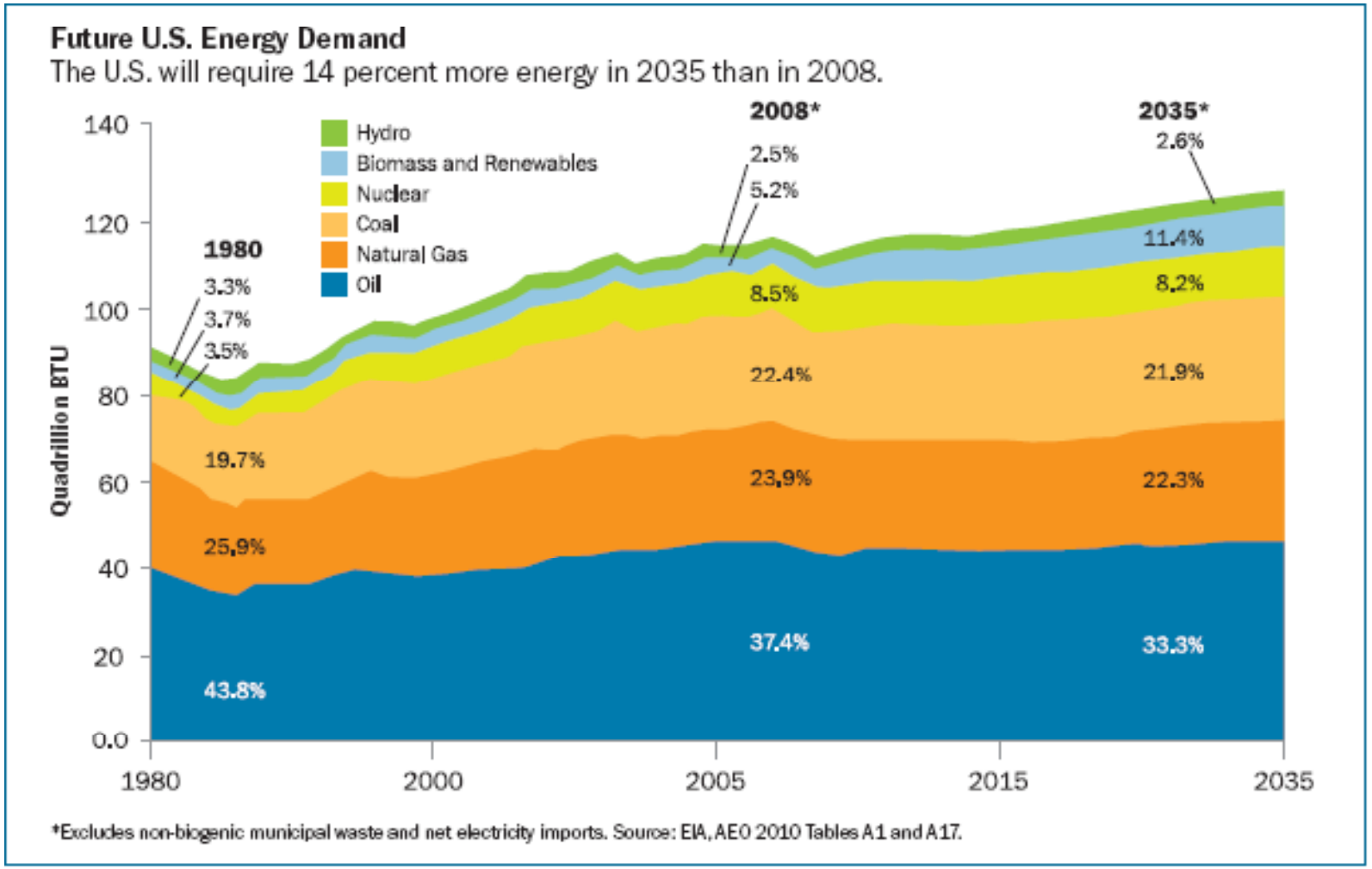
Overview

- Why develop offshore U.S.?
- U.S. energy resources
- Administration OCS Policy
- Post incident response
- Industry efforts to improve performance

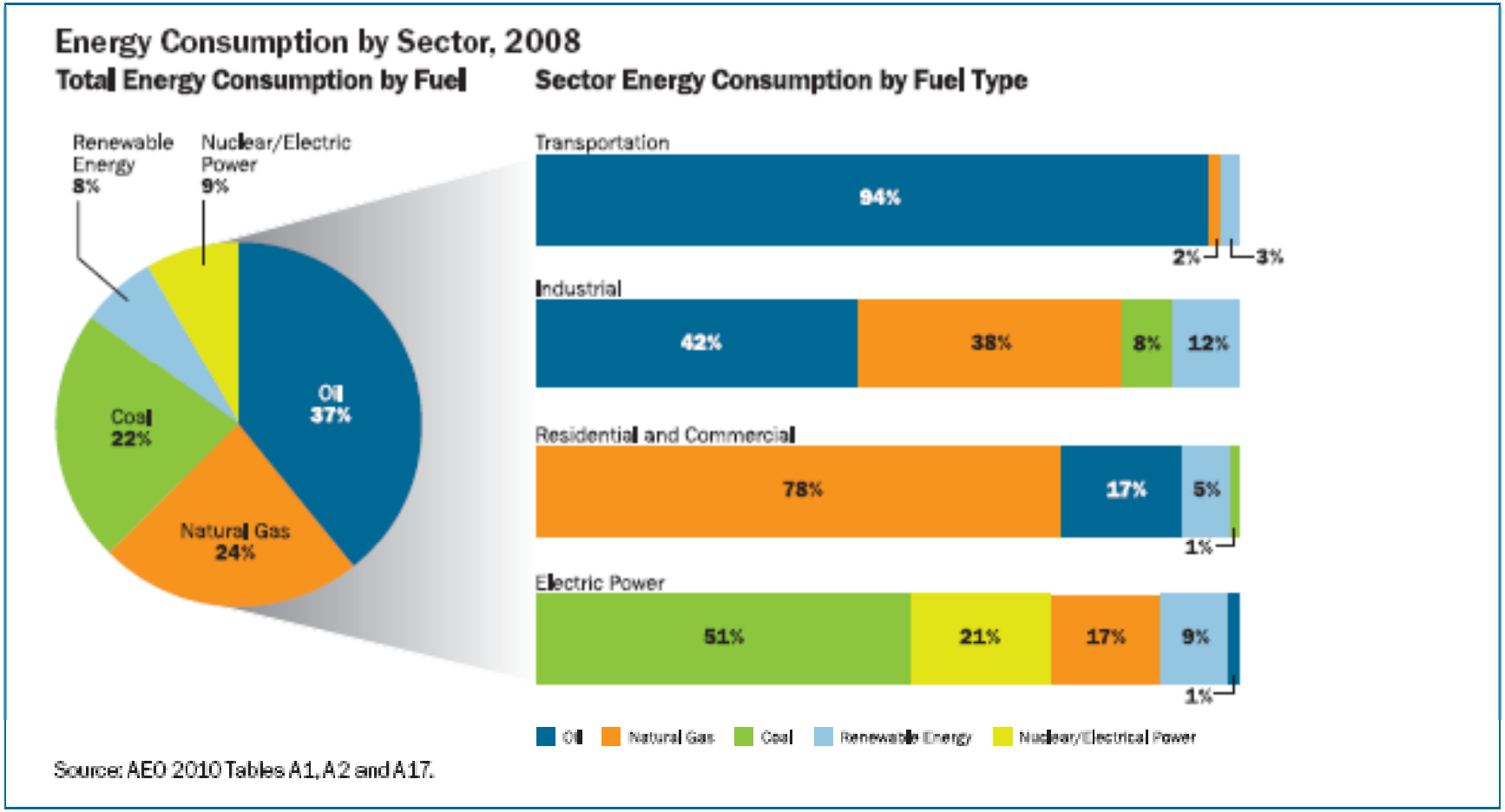
Global Demand Growth



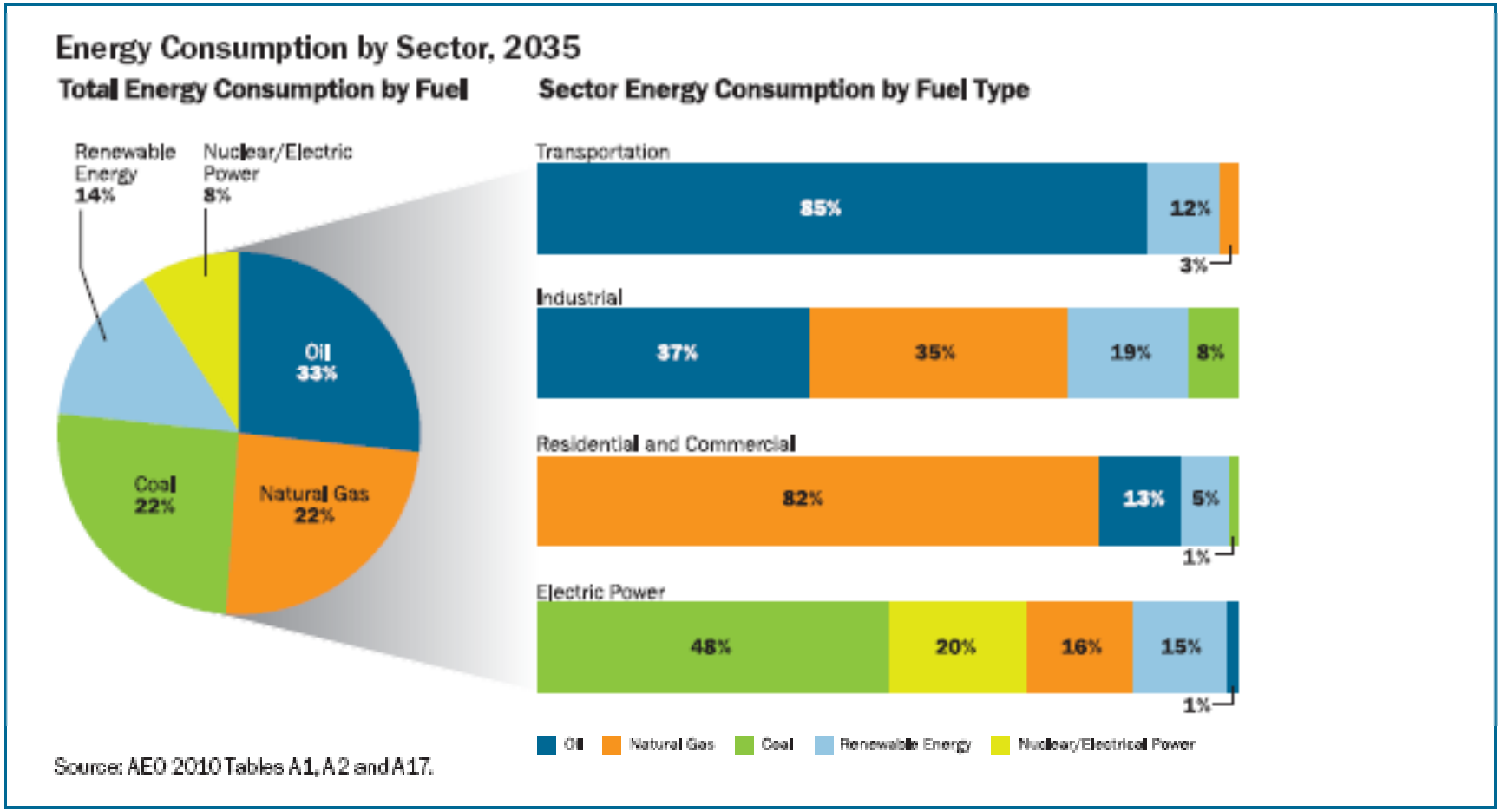
Importance of Continued Oil and Gas Development



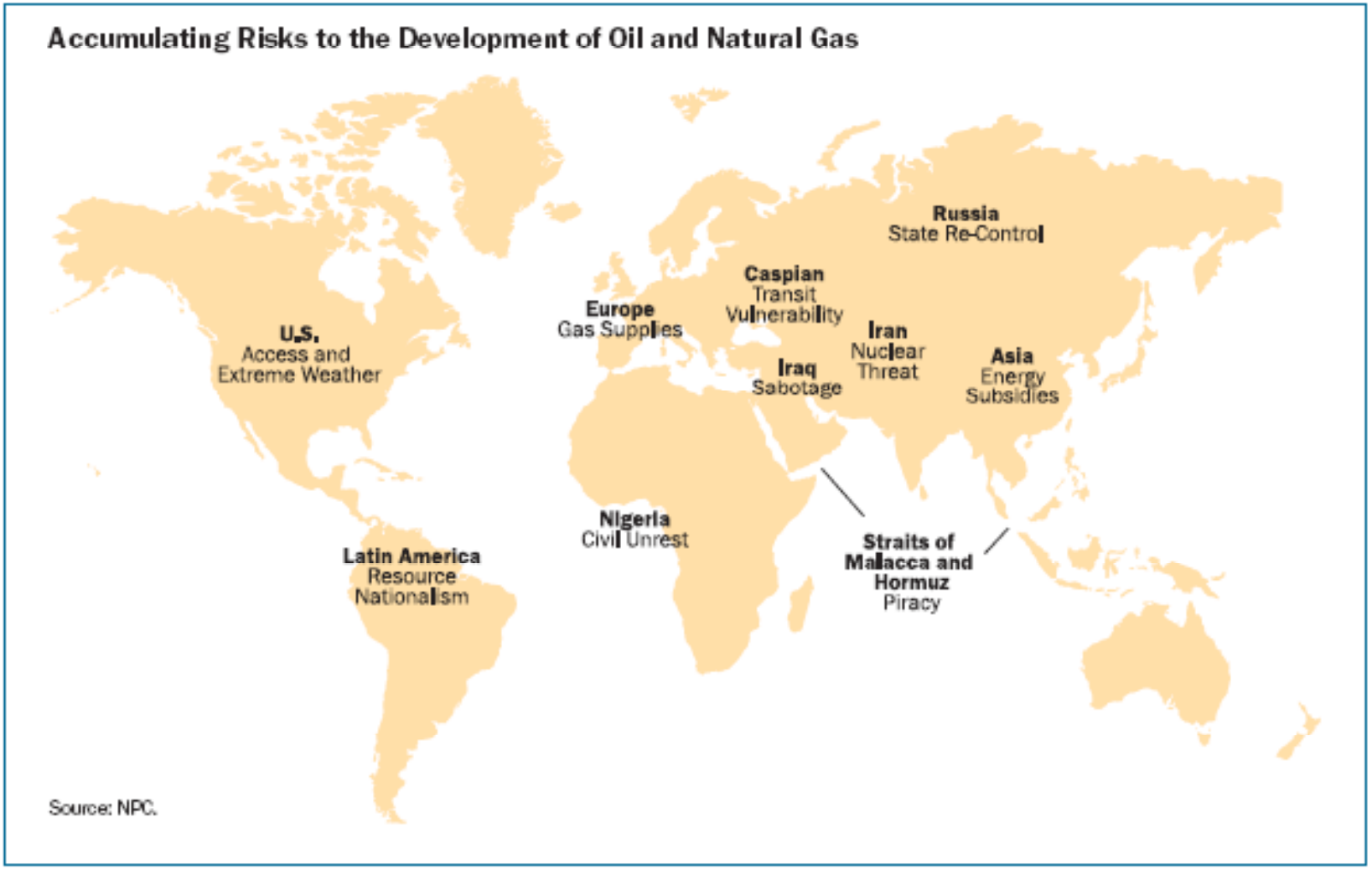
U.S. Energy Use – 2008



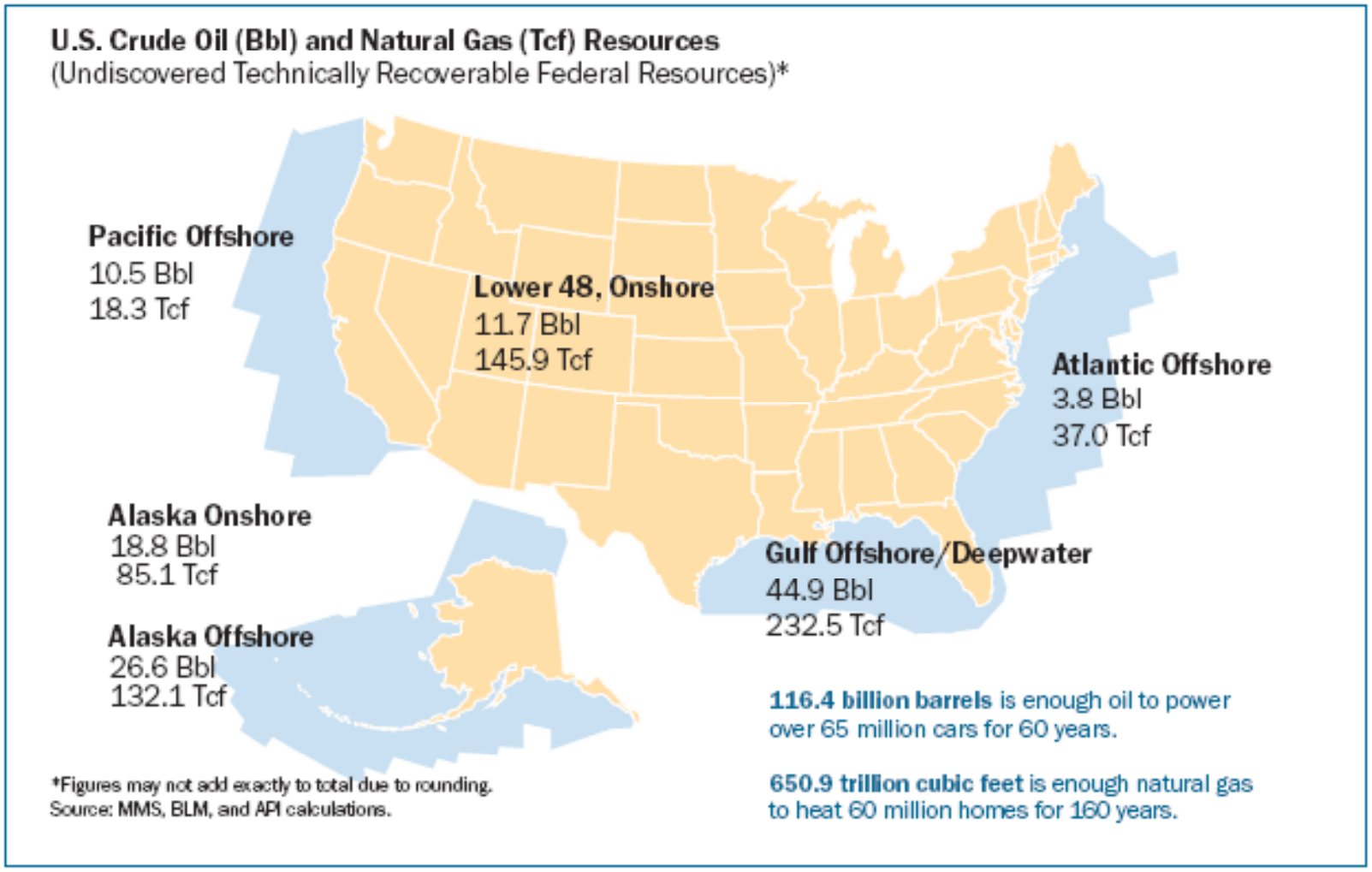
U.S. Energy Use – 2035



Imported Oil Risk Factors



U.S. Oil and Natural Gas Resources



Importance of Deepwater Exploration

- Global deepwater production capacity has more than tripled since 2000
- Deepwater discoveries are important to the reserve base
- Deepwater discoveries are larger, on average, than new onshore discoveries
- U.S. GOM deepwater projects are driving higher U.S. oil production

Source: IHS CERA, Role of Deepwater Production in Global Oil Supply, 2010

Atlantic OCS Resource Potential

- The BOEMRE reassessing Atlantic OCS oil and gas resources
- Focus - geologic analog information from discoveries in Eastern Canada and West Africa
- Older data may not be adequate for detailed prospect mapping
- Canadian experience - even with modern 3-D seismic data, difficult to locate reservoirs
- Newer seismic acquisition techniques, such as 3-D wide azimuth used in conjunction with controlled source electromagnetic (CSEM) data allow for better images of geologically complex areas
- These technologies were not available when the existing Atlantic OCS data were acquired 25 or more years ago.

Derived from material contained in **OCS Report MMS 2009-015**

energy API

Leasing, Exploration and Development Process

Pre-Lease

Develop OCS 5-Year Program (18 to 24 months)

Solicit Comments → 45-day Comment Period → Publish Draft Proposed Program → 60-Day Comment Period → Announce Proposed Program / Publish Draft EIS → 90-Day Comment Period → Announce Proposed Program / Publish Final EIS → 60-Day Period with Congress → **Announce OCS 5-Year Leasing Program**

Planning for Specific Sale (1 year)

Publish Call for Information → 45-day Comment Period → Define Sale Area → Publish Draft EIS Proposed Notice → 90-Day Comment Period → Publish Final EIS / Publish Proposed Notice of Sale / CD to Governors (30-Day Comment Period / 60-Day Comment Period / 90-Day Comment Period) → Publish Notice of Sale → 30-Day Comment Period → Lease Sale → **Issue Leases**

Post Lease

Exploration Plan Approval (18 to 24 months)

Submit Exploration Plan → Begin Environmental Assessment / Begin CZM Review → 90-Day CZM Review by States → Approve Exploration Plan → Approve Drilling; Grant Environmental Permits → Start Exploration Drilling → Complete First Exploration Well → **Delineation Drilling**

Development & Production Plan Approval (3 to 5 years)

Submit Development and Production Plan → Begin CZM Consistency Review → Publish Draft EIS → 90-Day Comment Period → Publish Final EIS → Obtain CZM Consistency / Approve Development and Production Plan → Production Well Application → **First Oil and Natural Gas Production**

ADP = Application for Permit to Drill | CD = Consistency Determination | CZM = Coastal Zone Management | EIS = Environmental Impact Statement **Source: MMS**

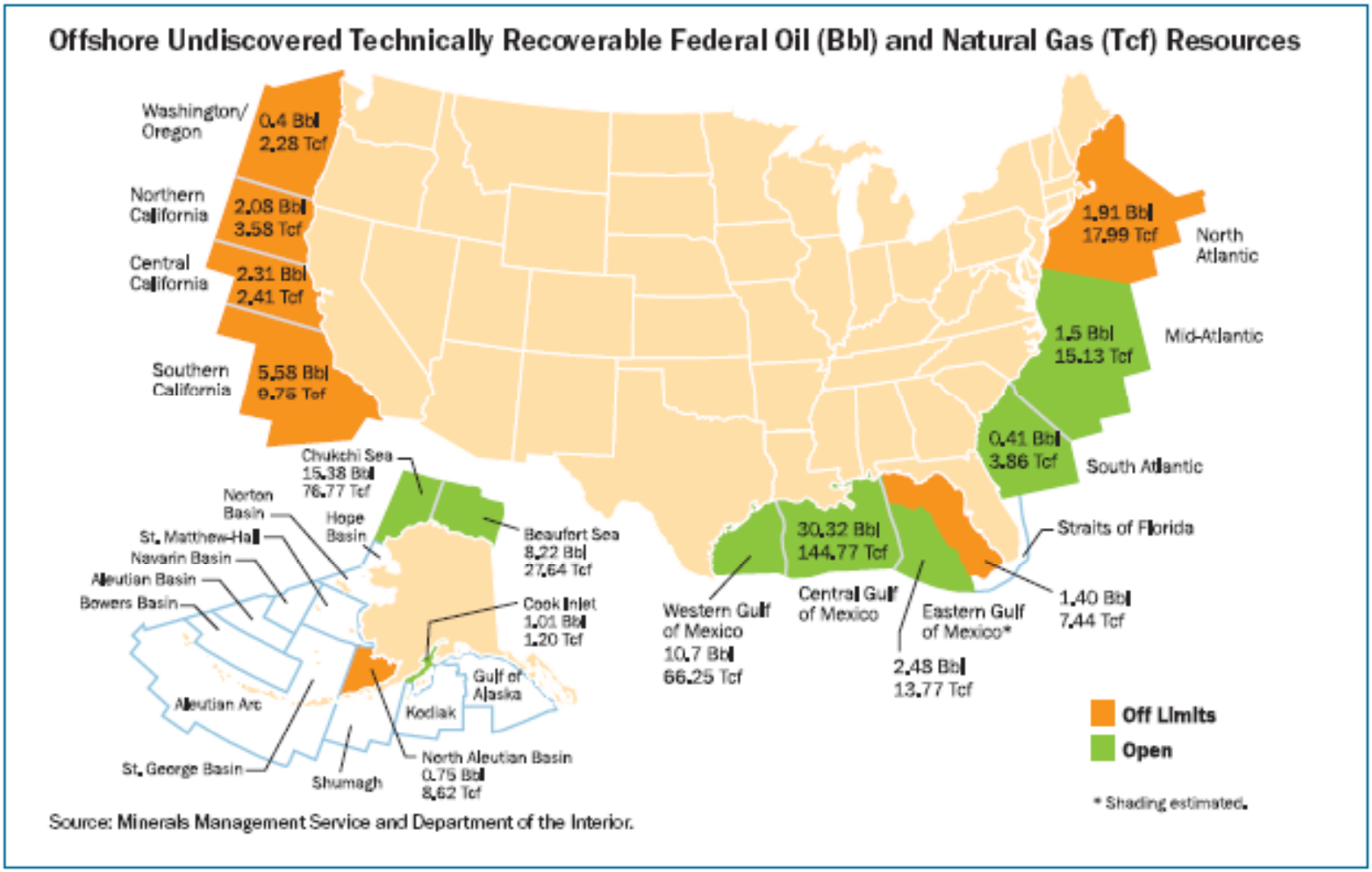
Obama Administration OCS Oil and Gas Strategy

- Announced March 31, 2010
- 2007-2012 5-year Plan
  - Virginia Sale 220 affirmed
  - Atlantic Seismic Environmental Study to proceed
  - Alaska sales curtailed
  - Alaska exploratory drilling to proceed

Obama Administration
OCS Oil and Gas Strategy

- 2012-2017 5-year Plan
  - Mid- and South Atlantic to be considered
  - Portion of Eastern Gulf of Mexico to be considered
  - Alaska Lease Sales to be consider based on drilling results and environmental studies
  - North Aleutian Basin/Bristol Bay placed off limits
  - Environmental Impact Study to begin

Areas Considered for Leasing 2012-2017



Administration Response to Gulf Incident

- Virginia Lease Sale cancelled
- 2010 Western Gulf Sale cancelled
- 2012-2017 5-year Plan public hearings postponed
- Atlantic and Eastern GOM not considered for inclusion in 2012-2017 5-year Plan
- Alaska exploratory drilling postponed
- Atlantic Seismic Environmental Study to proceed

Administration Response to Gulf Incident

- Enhanced Drilling Safety Measures announced - Interim Final Rule
- Spill response capability upgrades required (NTL-06 and NTL-10)
- Deepwater Drilling Moratorium announced – since rescinded
- Presidential Oil Spill Commission formed
- BOEM established

Industry Response to Gulf Incident

- Joint Industry Task Forces formed
  - Deepwater Operations
  - Well Control Equipment
  - Subsea Containment
  - Oil Spill Response

Industry Response – Joint Industry Task Forces

- Goal: Improve equipment, operations and response
- Short-term Focus
  - Comprehensive review of equipment, designs, processes/procedures, testing protocols, planning, regulations, and associated data
  - Identify gaps
  - Make recommendations to close identified gaps and to align industry standards with recognized best practices
  - Provide safety recommendations to Department of Interior
- Long-term Focus
  - Incorporate lessons learned into industry standards

Industry Response – Offshore Operating Procedures

- Processes Associated with Drilling and Completing Deepwater Wells
- Focus on Mechanical Loads, Cementing Practices, Barriers and Well Displacement
- Addressing Health, Safety & Environment Case
- Over 30 Participants representing 20 Organizations

Industry Response – Offshore Operating Procedures

- Health, Safety and Environment (HSE) Case and Well Construction Interfacing Document
- Operating Procedures:
  - Engage proper lock down mechanisms when casing is installed
  - Provide multiple independent barriers for each flow path
  - Perform pressure tests to anticipated pressures or higher
  - Close BOPs during displacement to underbalanced fluid columns
  - Perform separate displacement operations for riser and casing – Monitor volumes
  - Ensure drillstring components are able to be severed during displacement
  - Form API committee to develop well design best practices
  - Adopt API RP 65 Part 2: Isolating Potential Flow Zones During Well Construction

Industry Response – Offshore Equipment

- Review Current BOP Equipment Designs, Testing Protocols, Regulations and Data
  - Secondary BOP Control Systems
  - BOP Testing and Test Data
  - Remotely Operated Vehicles
- Over 60 Participants; Over 30 Organizations

Industry Response – Offshore Equipment

- Secondary BOP Control Systems
  - Ensure ability to operate key equipment at anticipated pressures
  - Perform full surface function/pressure testing prior to running of the BOP stack
  - Conduct subsea testing of hydraulic function of rams and valves
  - Arm the system when the BOP stack is latched on the wellhead
  - Disarm and rearm only if approved through formal MOC process
- Other Secondary Control Systems
  - Establish Phase 2 work group to evaluate system combinations and capabilities under various conditions – Make recommendations
  - Evaluate processing acoustic systems to remove ambient noise
  - Engage national research facilities

Industry Response – Offshore Equipment

- BOP Testing and Test Data
  - Send test results to BOEM
- Remotely Operated Vehicles
  - Ensure ROV can close blind shear rams, pipe rams, casing shear rams, and choke and kill valves
  - Ensure ROV can unlatch the LMRP
  - Standardize ROV hot stab and receptacle per API Spec. 17H
  - Surface test ROV functionality – develop visual reference capability to confirm ram closure
  - Identify methods for testing without introducing seawater in BOP system
  - Stage ROV tooling/external hydraulic power supplies strategically in the Gulf

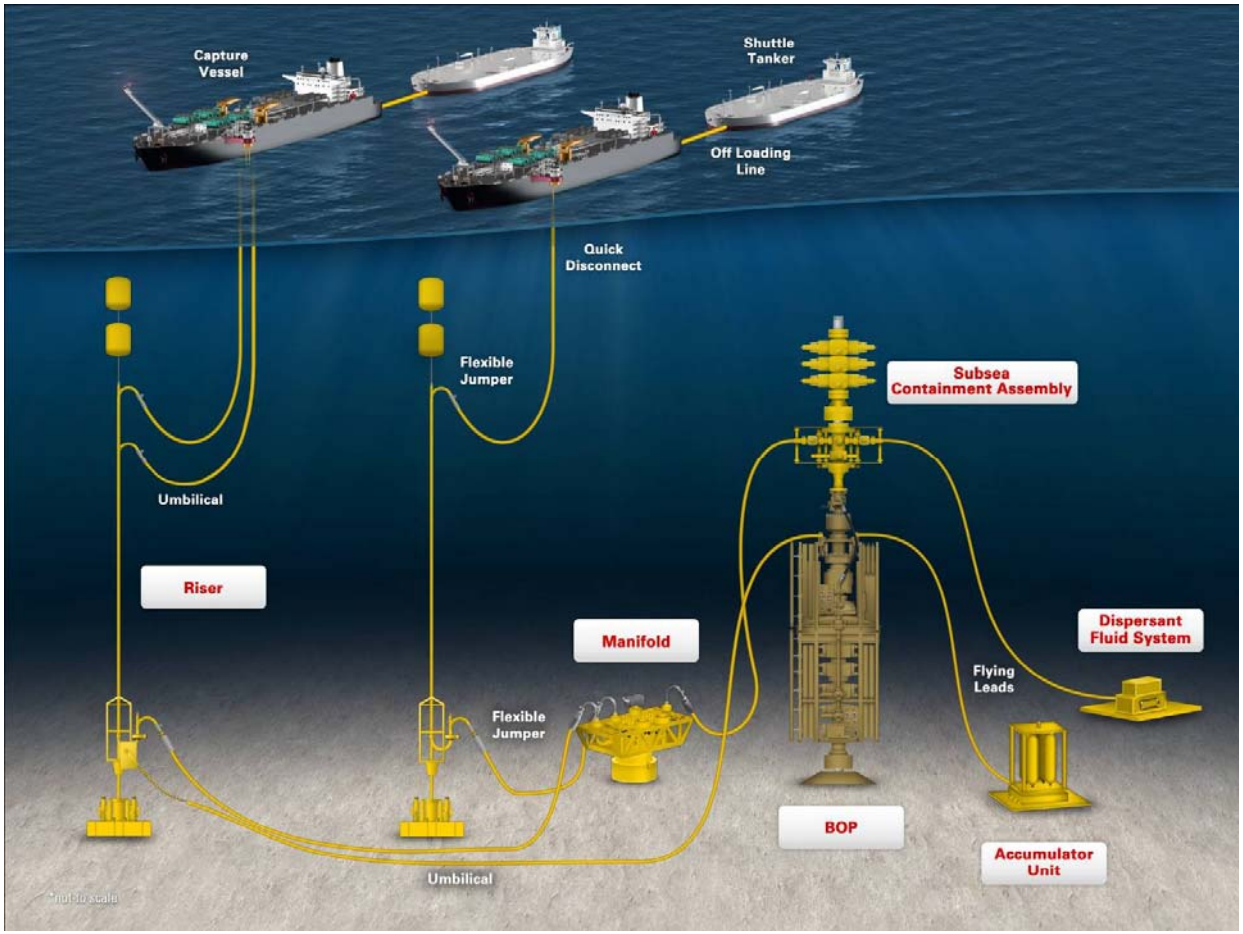
Industry Response – Subsea Well Control and Containment

- Review response should BOP fail and/or BOP intervention fail
- Over 30 participants/organizations

Industry Response – Subsea Well Control and Containment

- Well Containment at the Seafloor
  - Hard Connect
  - Top Kill
  - Existing Equipment Modification
- Intervention and Containment within the Subsea Well
  - Relief Well Considerations
  - Dynamic Kill
  - Direct Mechanical Intervention
- Subsea Collection and Surface Processing and Storage
  - Capture Systems

Well Containment Company



- Provide flexible & adaptable systems
- Contain the well subsea
- Provide subsea production capability
- Subsea equipment, risers, etc.
- Vessels that will safely capture, store and offload the oil

Industry Response – Oil Spill Response

- Oil spill response plans
- Oil sensing and tracking
- Dispersant use and application
- In-situ burning
- Mechanical recovery capabilities
- Shoreline protection and clean-up
- Alternative response technologies
- Funding

Industry Response – Oil Spill Response

- Collaboration between private and public sectors in effective and efficient oil spill response
- Public sector input should be coordinated to avoid confusion
- Education, communication, and cooperation are the key to future improvements

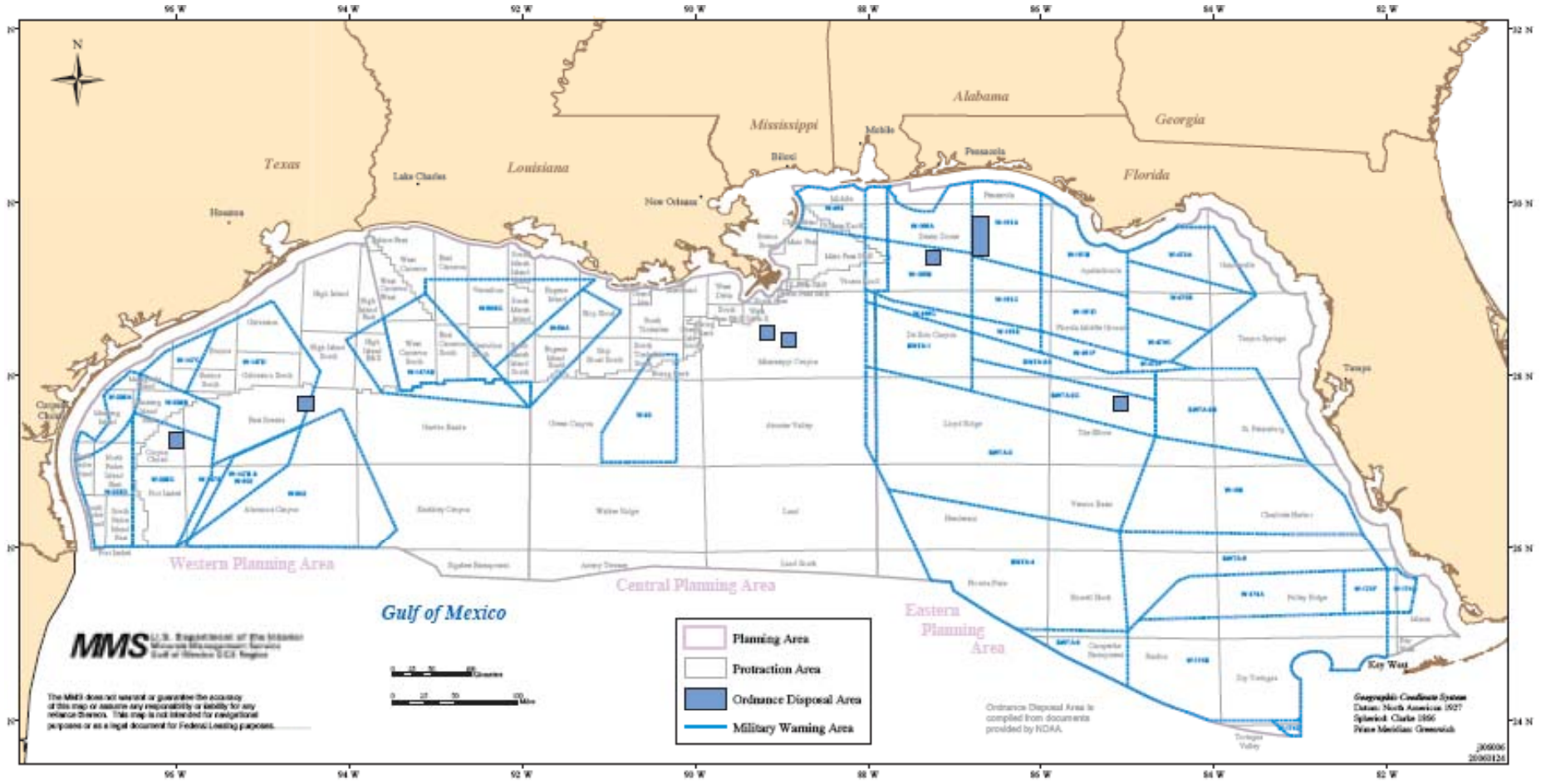
Results and Recent Developments

- Significant progress made to improve prevention, intervention and spill response
- Commitment to making further progress
  - Well Design and Construction RP
  - Well Construction Interface document
- New safety management systems regulations issued

Looking Forward

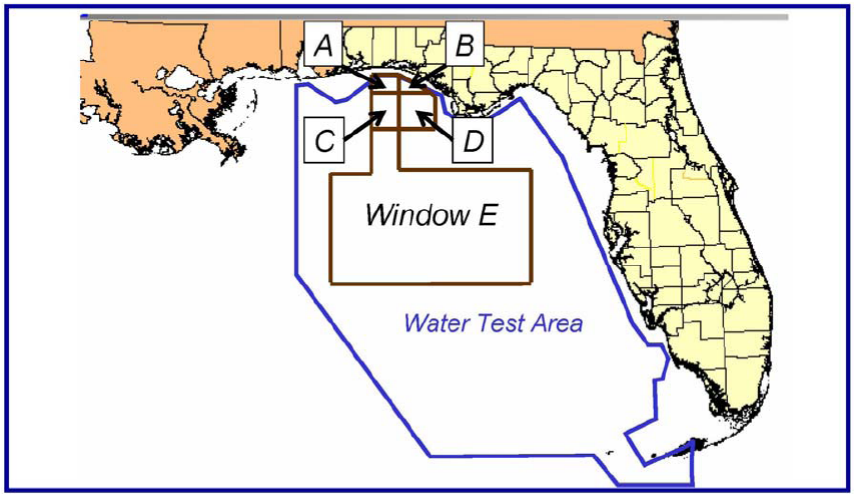
- Results of investigations
- Additional rulemaking
- End of permitting delays??
- Increased time to drill offshore wells
- 2012-2017 5-year leasing plan development

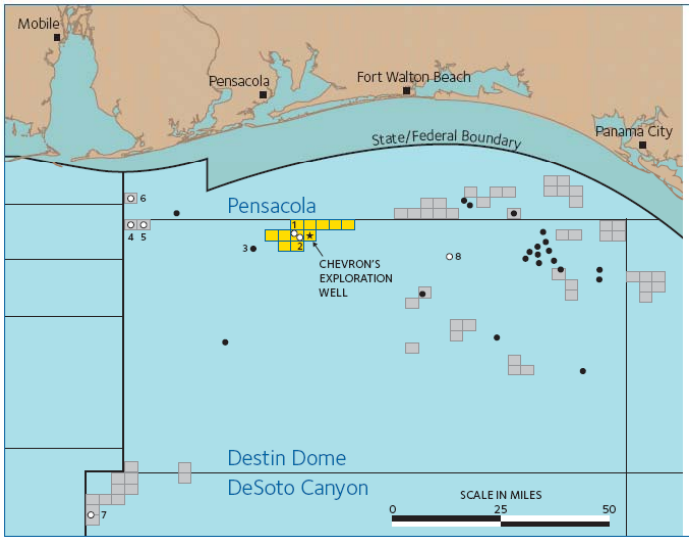
Gulf of Mexico – Military Special Use Airspace and Surface Operations



Coexistence of Military Use and Oil and Gas Exploration

- Long history of collaboration between government agencies and industry
- Memorandum of Agreement in place
- Drilling Window Program in place
- Previous activity in military training areas





Questions?

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