OFFSHORE PETROLEUM: NEWFOUNDLAND CASE STUDY

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OBJECTIVES

- A Narrative Description of the Development of an Oil Industry:
  - Canadian example
- Indicate:
  - Sequence of Activities
  - Uncertainties
  - Effects
- Provide Framework for Understanding Later Material
- Warning: The Development in any Region is Unique

PRESENTATION STRUCTURE

- Historical Context
- The Newfoundland Offshore Oil Industry:
  - Early exploration (1963-1979)
  - Development hiatus (1979-1990)
  - The Hibernia project (1990-1997)
  - Other projects
- Benefits from the Industry
- Concluding Remarks: Dangers of Comparative Study

HISTORICAL CONTEXT

- Settlement History
- Colonial Status (1832)
- Dominion of Newfoundland (1855)
- Commission of Government (1932)
- Confederation with Canada (1949)

HISTORICAL CONTEXT

- The Newfoundland Economy:
  - Dependence on resources
  - Low levels of industrialization
  - High unemployment
  - Low labour force participation
  - High out-migration (temporary and permanent)
  - Dependence on federal transfers

EARLY EXPLORATION

- Parson's Pond (1867)…
- First Federal Permits (1963)
- Whose Offshore?
- First Well (1966)
- Early Drilling:
  - Labrador (gas finds)
  - Grand Banks and N.E. Coast
- Provincial Political Developments:
  - Smallwood defeated (1971)
  - Peckford appointed Minister of Mines and Energy (1976)
  - New approaches based on Norway

EARLY EXPLORATION

- Revised Provincial *Act Respecting Petroleum and Natural Gas* (1977):
  - Revenue
  - Ownership
  - Business and employment opportunities
  - Training and R&D
  - Rate and manner of development
  - Protect socio-economic and biophysical environment
- Exploration Lull
- Federal *National Energy Policy* (1981)

DEVELOPMENT HIATUS

- Hibernia Discovery (60th well)
- Speculative Activity
- Political Developments:
  - Flurry of political and legal activity
  - Nova Scotia settlement
  - Federal Supreme Court ruling (March 1984)
  - Letter of Understanding (June 1984)
  - Federal General Election
  - Atlantic Accord (1995)

DEVELOPMENT HIATUS

- Atlantic Accord:
  - Joint management (C-NOPB)
  - Mode and pace of development
  - Revenues (principal beneficiary)
  - $300 million Offshore Development Fund
  - Joint Environmental Impact Assessment (EIA)
  - Canada-Newfoundland Benefits

DEVELOPMENT HIATUS

- Provincial Benefits Priorities:
  - Maximize the direct economic benefits
  - Revenues not the main priority (equalization)
  - Minimize negative effects on traditional industries, communities and culture
  - Avoid ‘boom/bust’
  - Use Hibernia to ‘kick-start’ industry

DEVELOPMENT HIATUS

- Canada-Newfoundland Benefits Plans:
  - Exploration programs
  - Development Applications
- Main Issues Addressed:
  - Business opportunities
  - Employment opportunities
- Topics Covered (DA):
  - Approach, policies and procedures
  - Supplier development
  - Procurement process
  - Technology transfer and R&D
  - Training and succession planning

DEVELOPMENT HIATUS

- Education Initiatives By and Through:
  - Operating companies and CAPP
  - NL Mines and Energy
  - Atlantic Canada Opportunities Agency
  - Newfoundland Ocean Industries Association , and/or
  - Municipal governments
- Example Initiatives:
  - Conferences and courses
  - Supplier workshops
  - Missions and trade shows

DEVELOPMENT HIATUS

- Hibernia Developments:
  - Delineation drilling
  - The Ocean Ranger disaster (15 February 1982)
  - Development of production options
  - Preparation of Development Application
  - Public and government reviews of Development Application:
    - Development Plan
    - C-N Benefits Plan
    - EIS and SEIS
    - Safety Plan

DEVELOPMENT HIATUS

- C-NOPB *Decision 86-01*
- Further Exploration and Delineation (total, by 1991):
  - 117 exploration wells
  - 15 economic discoveries
  - 23 delineation wells
- Declines in the Price of Oil
- Hibernia Agreement in Principle (1989)
- Hibernia Agreement (1990)

HIBERNIA PROJECT

- Hibernia Partners:
  - Mobil Oil Canada (28%)
  - Gulf Oil Canada (25%)
  - Petro-Canada Resources (25%)
  - Chevron (22%)
- Government Commitments:
  - Pay 25% of costs (to max $1.04 billions)
  - Loan guarantees for 40% construction costs (to max of $1.66 billions)
  - Provincial tax concessions

HIBERNIA PROJECT

- Canada Benefits Commitments:
  - 55% to 60% of $5.2 billion pre-production expenditures
  - 65% of $10 billion operating expenditures
  - 13,000 person/years of construction employment (70% of total)
  - 20,000 person/years of operations employment

HIBERNIA PROJECT

- NL Benefits Commitments:
  - Build gravity base structure (GBS)
  - Fabricate, assemble and outfit well-head module, helideck, air control module, lifeboat stations and flare boom
  - 50% of GBS design engineering, and design engineering for accommodations, flareboom, helideck and sub-sea lines
  - 10,000 person/years of construction employment (50% of total)
  - Most operations employment
  - Some taxes and royalties

HIBERNIA PROJECT

- Construction Started: 1990
- Bull Arm Greenfield Construction Site
- Gulf Oil Canada Hiatus: 1992-1993
- GBS and Topsides Mated: Early 1997
- Tow-Out: June 1997
- Peak Bull Arm Employment: c 6000
- No Significant Negative Community Effects

HIBERNIA PROJECT

- Total Capital Cost: $5.2 billion
- Met or Exceeded All Benefits Commitments
- Total Expenditures: c $6 billion (45% in NL, 75% in Canada)
- 26,000 Person-years of Employment (peak: 6600)
- 59% of Employees Newfoundlanders
- 1.8 million Hours of Design Work
- 6000 POs to NL Companies

OTHER PROJECTS

- Terra Nova (Petro-Canada):
  - Discovered: 1984
  - Development started: 1999
  - No government support
  - Design: FPSO (hull built in South Korea)
  - Topsides fabricated/installed: Bull Arm
  - Capital cost: $2.8 billion
  - First production: 2002

OTHER PROJECTS

- White Rose (Husky Energy):
  - Discovered: 1988
  - Development started: 2002
  - No government support
  - Design: FPSO (hull built in South Korea)
  - Topsides fabricated/installed: Marystown
  - Estimated capital cost: $2.35 billion
  - First production: early 2006

OTHER PROJECTS

- Hebron? (Chevron):
  - Discovered 1980
  - Some heavy oil
  - Highly fractured reservoirs
  - Multiple design options being considered
- Labrador Gas?
- Further Exploration:
  - Orphan Basin
  - Lawrentian Sub-basin
  - Other

BENEFITS (1999-2002)

- **Capital costs ($ m):**
  - **Exploration: 31 to 264**
  - **Development: 470 to 923**
  - **Production: 181 to 518**
- **Operating costs ($ m): 136 to 234**
- **Wages, salaries & benefits ($ m): 171 to 272**
- **Employment (person-years):**
  - **Development: 400 to 1976**
  - **Operations: 1874 to 1928**

BENEFITS (mean, 1999-2002)

- **NL GDP up $1.9 Billion**
- **Total Contribution to NL GDP: 14.7% (19.1% in 2002)**
- **Personal Income up 6.0%**
- **Retail Spending up 5.7%**
- **95 Housing Starts**
- **Total Employment up 13,900**
- **Unemployment Rate Down 2.4%**
- **Population up 8000 (13,000 in 2002)**

BENEFITS: DIRECT GDP (2002)

- **Offshore Petroleum (%): 15.3**
- **Other Sectors (%):**
  - **Retail trade 6.1**
  - **Manufacturing 5.7**
  - **Electrical power and water utilities 5.4**
  - **Fishing and fish processing 5.7**
  - **Forest products 2.4**

BENEFITS: INDUSTRIAL INFRASTRUCTURE

- Total value: c $1.2 billion
- Examples:
  - Bull Arm construction yard
  - Marystown Shipyard fabrication centre
  - Sub-sea systems fabrication centre
  - Newfoundland Transshipment Terminal
  - Helibase and supply base
  - Pipeyard, warehouse and operations centre

BENEFITS: E&T AND R&D INFRASTRUCTURE

- Memorial University of Newfoundland:
  - Earth resources research
  - Cold ocean resources engineering
  - Wave and ice tanks
  - Offshore and remote medicine
- Marine Institute:
  - Marine offshore simulator training
  - Offshore safety and survival training
- College of the North Atlantic:
  - Petroleum technology & rig training facilities

BENEFITS OVERVIEW

- Economic Growth and Oil Revenues
- Diversification:
  - New sector
  - Exports
- Improved Training, R&D, Transportation and Communications
- Competitiveness:
  - New personnel and equipment
  - Improved business capabilities (bidding, QA/QC, accounting, management, etc.)
- Confidence, Morale and Ambition
- ‘Real World’ Opportunities

DISTRIBUTION OF BENEFITS

- St. John's Region:
  - Supply and service (air and marine)
  - Management, administration and regulation
  - Engineering and design
  - Construction (NEWDOCK)
  - Training and R&D
- Eastern Newfoundland:
  - Rig mobilization
  - Construction (Bull Arm, Marystown)
  - Transshipment terminal
  - Platform, rig, tanker and other offshore crew
- Elsewhere:
  - Spin-off (e.g., tourism) and resource revenues (?)

DISTRIBUTION OF BENEFITS

- Scotland in 1970s:
  - > 85% employment in Aberdeen Region
- Since Then:
  - Reduced local construction
  - Larger, longer range, boats and helicopters
  - Reduced offshore crewing (CRINE, NORSOK)
  - Asset sharing
- Onshore Concentration of Administration, Management, Regulation, Supply & Service
- ‘Supply Base Fever’

SUPPLY BASE FEVER

- Port Atlantis, Freshwater Bay, Bay Bulls & Botwood (Runavik, Torshavn & Tvoroyri…)
- Ideal Supply Base Concept
- Good for Community Leaders, Architects and Artists
- Industry Pragmatism (Hibernia: Pier 22)
- High Levels of Variability in Exploration Activity

DURATION OF BENEFITS

- 1963: 1st Seismic
- 1966: 1st Exploration Well (+3)
- 1979: Hibernia Discovery (+16)
- 1990: Hibernia Construction Starts (+27)
- 1997: Hibernia Production Starts (+34)
- 1999: Terra Nova Construction Starts (+36)
- 2002: Terra Nova Production and White Rose Construction Start (+39)

DURATION OF BENEFITS

- "It's Always 20 Years"
- Reasons for Increased Durations:
  - New technologies
  - New fields and pools
- Newfoundland and Labrador: 1963-2020 and Beyond
- Other Examples:
  - North Sea (since early 1960s)
  - Gulf of Mexico (since 1938)
  - California (since c 1950)
- All but Last Seeing New Projects & Exploration

COMMUNITY IMPACTS

- Management Critical
- Impacts are Mostly Metropolitan:
  - Capacity to absorb (?)
- Construction Impacts (if rural):
  - Danger of boom and bust
  - Can be managed
- Impacts Positive as well as Negative:
  - Stereotypical expectations (e.g. crime and family life)
  - Cured by experience (CNOPB DA Guidelines)
- Speculation a Threat:
  - Dangers of comparative study

CAVEAT: COMPARATIVE STUDY

- Erroneous Assumptions:
  - Scotland, therefore Newfoundland
  - Stavanger, therefore St. John's
  - Newfoundland, therefore Northern British Columbia
- Ignores a Variety of Factors
- Can Lead to Inappropriate Harmful Responses
- Undertake Comparative Study with Care

CAVEAT: COMPARATIVE STUDY

- Different Types and Scales of Activity:
  - Supply base fever
  - Planning St. John's International Airport
  - Visiting Bull Arm
- Different Local Contexts:
  - Different geography
  - Labour markets, industrialization, aspirations
- Confusing Experience and Understanding:
  - Why the St. John's population didn't boom

CAVEAT: COMPARATIVE STUDY

- The Attribution Problem:
  - The Stavanger crime wave
- Uncertainty:
  - Geological, economic, technological, political
- Self-interest:
  - The wish-lists of police, social and health services agencies, environmentalists, etc.
- The Role of Management:
  - Back to Bull Arm…