



ECONOMIC RANKING OF NORTH AMERICAN GAS BASINS

1st Edition

A Multi-Client Study

Pages: 92

Figures: 64

Tables: 23

Basins Assessed: 24

Over Plays: 85

LNG Regions: 3

Spring 2008

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06GC-6002-10

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SUMMARY

Introduction

While natural gas prices are transparent at major marketing hubs across North America, a key question remains outstanding. What are the full cycle costs for new gas in the various traditional gas basins and especially the promising new gas sources: onshore, offshore, frontier, and imported LNG? The answer is critical to assess North American new gas supply dynamics, where most activity is developing Unconventional Gas.

To address this question, Ziff Energy uses its widely recognized specialty knowledge gained from two decades of producer Finding and Development Cost assessments, numerous in-depth gas basin operating cost studies, gas supply analysis, key regional producer interviews, investor presentations, and industry research. The analysis covers full cycle costs for 6 new gas types¹:

- Conventional Gas
- Shale Gas
- Tight Gas
- Offshore and Frontier Gas
- Coalbed Methane
- LNG.

The study helps producers prioritize which gas basins to focus on. Many of the gas basins provide full cycle costs for several play types.

Scope of Multi-client Assessment

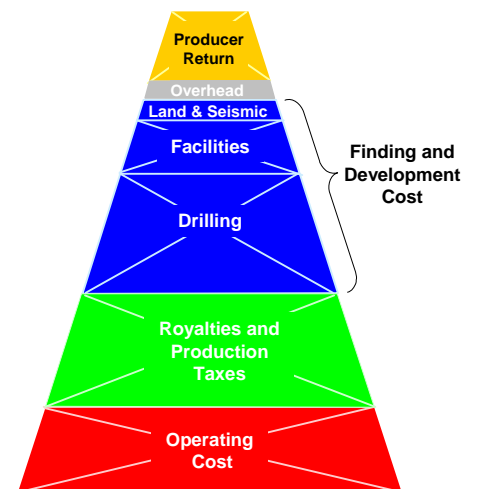
The multi-client assessment is organized into:

- a summary of the full cycle gas costs for each of the 2 dozen production areas analysed, providing an ‘apple to apple’ comparison of full cycle costs for new gas supply
- a detailed assessment of each basin’s new gas supply cost grouped into the 6 gas types
- for completeness, Ziff Energy includes a brief summary of the initial project description and related company literature in Appendices B and C.

Figure 1.1 presents the cost categories used in the report:

- Operating Costs to the point of gas sale
- Royalties and Production Taxes
- Finding and Development capital costs and the ultimate recoverable reserves, with an allowance for dry holes (success rate varies between explorers)
- Overhead includes all general and administrative expenditures
- Ziff Energy calculated a 15% before income tax rate producer rate of return.

**Figure 1.1
Cost Components**



¹ Ziff Energy excludes analysis on Gas Hydrates and Offshore west Canada due to the 10 to 15+ years to develop

Gas Basins Analysed

Table 1.1 provides a matrix of the gas areas assessed and supply types, allowing a client to identify similar gas types.

Table 1.1
Matrix of Gas Types and Basins Evaluated

Basin		Gas Type				
		Conventional Onshore	Tight Gas	Coalbed Methane	Shale Gas	Offshore and Frontier
1	Western Canada	✓ (4)	✓	✓	✓	
US ONSHORE						
2	Arkoma	✓	✓		✓	
3	Anadarko	✓				
4	Hugoton	✓				
5	Appalachia	✓				
6	Permian Basin	✓				
7	Greater Green River		✓			
8	Uinta		✓			
9	Piceance		✓			
10	East Texas		✓			
11	North Louisiana		✓			
12	South Texas		✓			
13	Powder River			✓		
14	San Juan			✓		
15	Raton			✓		
16	Barnett Shale (Ft. Worth)				✓	
17	Fayetteville Shale				✓	
OFFSHORE NORTH AMERICA						
18	GOM Deepwater					✓
19	Deep Shelf					✓
20	Shelf					✓
21	East Coast Canada					✓
FAR NORTH						
22	Alaska North Slope					✓
23	Mackenzie Delta					✓
LNG						
24	LNG Atlantic Basin					✓
25	Pacific Basin					✓
26	Middle East					✓

Figure 1.2 illustrates that the *gas basins* studied and analysed represent *about 90%* of recent North American gas production. Where appropriate, Ziff Energy divides some gas basins into smaller areas. For example, Western Canada is divided into 6 sections: Deep, Foothills, Tight Gas, Medium Depth, Shallow, and CBM. The Gulf of Mexico is allocated into the Deepwater, and the Shelf.

Figure 1.2
North American Gas Basins Analysed (Bcf/d)

