The Future of the Interstate Natural Gas Pipeline Business

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CONTENTS

PREFACE

This study, The Future of the Interstate Natural Gas Pipeline Business, is the result of the ongoing research program on the North American natural gas industry conducted by the INGAA Foundation, Inc.

The objective of this study is to provide industry decision-makers perspective on the forces shaping the evolving interstate natural gas pipeline business. It offers a framework for understanding the rapid changes that are taking place and that will unfold in the coming years. The analysis and commentary is designed to identify the basic trends and relationships that will shape the future business environment.

The specific objectives of the study are to:

- examine the composition of new and traditional shippers in the future, with particular emphasis on the projected role of local distribution companies, unregulated wholesalers, and large end users

- identify the types of services that new and traditional end users are likely to require in order to ensure customer satisfaction and produce higher capacity utilization.

The INGAA Foundation contracted with Hagler Bailly Consulting, Inc. (Hagler Bailly) to examine pipeline capacity markets in the United States and Canada and examine opportunities for providing additional customer services by pipelines. The information and findings detailed in this study are the result of an extensive review of current literature and research, and more importantly, in-depth interviews with pipeline customers from all sectors of the natural gas industry. These interviews included senior executives from:

- seven local distribution companies
- six industrial end users
- four marketers and brokers
- four electric utilities/power plant buyers
- one producer
- four interstate gas pipelines
- three municipal gas utilities.

EXECUTIVE SUMMARY

S.1 INTRODUCTION

The natural gas industry in the United States is undergoing major changes that are reshaping traditional roles, creating opportunities for new participants, and redefining the scope and character of government regulation. As the result of proposals at both the state and federal level to further "unbundle" retail gas sales and create more robust secondary markets for pipeline capacity, the interstate natural gas pipeline industry may be buffeted by another round of regulatory changes.

S.2 FINDINGS

S.2.1 Fragmenting Customer Base

The traditional customer base of transmission pipelines is fragmenting and will continue to fragment in the near future. This fragmentation will provide significant opportunities for new entities organized around the central functions of competitive markets: marketing and customer service. To be successful, pipelines will have to gain access to a complete set of competencies through a combination of internal development and strategic alliances that establish market presence from the wellhead to the burnertip.

S.2.2 Customer Concerns

As the pipeline industry has evolved since the early 1980s, its customer profile has changed significantly. Understanding customer opportunities and needs is critical to developing the ability to provide the type of tailored product and service offerings customers reported they want from their pipeline companies. Table S-1 summarizes the issues and degree of concern expressed by the pipeline customers that were interviewed for this study.

S.2.3 The Current Market — Two Arenas for Determining Value

The value of pipeline capacity now is determined in two separate arenas:

- the difference in the market value for natural gas in separate locations (basis differentials)
- the secondary market for interstate capacity.

Table S-1
Degree of Customer Concern

Issue	Summary
Regulatory	
Compatibility and comprehensiveness of information and trading systems	Expect trouble-free access to required information
Liquidity of secondary market	Want a more liquid secondary market
Pipeline rate design	Want flexibility in rate design
State/federal jurisdictional issues	Concern about state vs. federal regulatory requirements
Uncertainty about future structure of industry	Very concerned about how structure will impact them
Service	
Communication and real-time information requirements	Desire real time information to manage supplies
Deal development services	Desire assistance in developing projects
Deal management services	Want services to simplify energy management
Flexibility to meet individual customer needs	Want individual needs met, indifferent to service/rate classifications
Reliability	Expect continued high levels of reliability
Safety	Satisfied
Transportation pricing flexibility	Want pricing to reflect individual circumstances
Market Power	
Confidentiality of customer information	Do not want information about their customers shared with competitors
Consolidation through mergers and acquisitions	Somewhat concerned about impact on market power
Control over firm contracts and ancillary services via tariffs	Very concerned that pipelines control competition via tariff language
Cross subsidization	Very concerned that cross-subsidies negatively influence competition
Data and information sharing requirements	Somewhat concerned about use of operational information for market advantage
Supply	
Flexible management of supply	Desire greater flexibility to manage supplies
Access to supply basins	Want access to various supply basins to manage price risk
Operational	
Billing accuracy	Satisfied with accuracy
Data and information sharing requirements	Want additional operational data
Meter reading services	Satisfied
Nominations	Satisfied

Neither arena provides perfect information on the value of pipeline capacity; one represents the relative price of the gas itself, and the other reflects the price for the entitlement to transport services. In addition, the increasing prevalence of gray market transactions means that the price/value of some deals goes undiscovered. Although basis differentials and secondary market trading operate separately today, they will eventually converge and become the underpinnings of the economics of new pipeline construction. The new marketplace will better pinpoint market signals about capacity availability or constraints, and will allow the industry overall to respond more quickly to changes in both supply and demand.

S.2.4 The Future Price of Capacity

As the markets for firm capacity develop more fully, the open market price of capacity on specific pipeline segments will drive customers' actual transport costs, and therefore both burnertip prices and producer netbacks.

- The upper end of prices will be limited by the availability and cost of alternative pipeline routes, and by alternatives to firm transportation such as storage, liquefied natural gas, alternative fuels, and demand-side management.

- The minimum value will fluctuate around the marginal fuel costs.

Original pipeline costs, currently the basis for pipeline ratemaking, are likely to play little or no role in determining the market-driven value in the future.

S.2.5 Pipeline Construction

Low market prices for capacity and high demand charges are also driving changes in the economics of new facilities construction. This results in:

- a much more difficult market for financing new pipeline construction
- a much more market-oriented environment for new pipeline construction.

Increased sophistication in the capacity markets will isolate higher value pipeline segments and will attract construction designed to relieve specific bottlenecks rather than to create new long-haul capacity. Investors are likely to be only those who need the capacity for more strategic purposes — producers and capacity merchants — where the overall project is profitable, even if the pipeline piece is not. Current expansion into the Midwest from Canada and the U.S. Rockies is an example of this phenomenon — producers are the major underwriters of these projects in efforts to find new premium markets for their gas. Under this growing uncertainty, long-term firm upstream contracts are beginning to look more like liabilities than assets for those companies

holding the capacity. If full LDC unbundling occurs before contract terms end, firm capacity may become a stranded cost.

S.2.6 Constraints to a Mature Capacity Market

As the secondary markets mature, transmission capacity in major supply corridors will become increasingly like a commodity, with basis differentials and pipeline capacity values converging. However, three major developments in the industry will have to occur to increase the liquidity and trading effectiveness of this marketplace:

- relaxation of capacity release restrictions by the Federal Energy Regulatory Commission
- improved flexibility through hubs and market centers
- more compatible and comprehensive information and trading systems.

The competitiveness of specific markets will be both driven and limited by market liquidity, with capacity in major transport corridors freely traded and reliably priced, and with values in less traveled corridors experiencing more volatility and price differentiation.

With a more liquid and effective secondary market for capacity, the most valuable and least valuable segments of capacity will become more isolated. In many cases, the most valuable segments are around very specific bottlenecks. With the growing financial risk associated with holding long-haul pipeline capacity, many new construction projects are now focusing on relieving these specific bottlenecks. Where bottlenecks are only seasonal in nature, pipeline construction will compete with storage, fuel substitution, or other forms of peak period demand management.

S.2.7 Capacity Transformation

Transmission capacity, or the right to transport natural gas on the nation's pipeline grid, is going the way of natural gas itself — it is being rapidly transformed into a traded commodity. Pipeline operations, investment, and financing will see fundamental changes as capacity transforms from its traditional status as a regulated fixed asset to a traded commodity. The pipeline business will look more and more like other capital intensive businesses that experience volatile price changes for their products.

Although the provision of firm transportation service can be expected to remain the backbone of the interstate pipeline's business, it may be the ability of pipelines to complement this service with diverse, flexible, and cost-reducing service alternatives that will determine both their share of the value-added market and how much firm capacity they are able to sell.

S.2.8 Outlook

The significance to the pipeline industry of a world in which the value of pipeline capacity is driven by changes in the commodity's value from one location to the next, rather than the embedded cost of transport, is difficult to overestimate. The changes in pipeline valuation will alter who controls and pays for new pipeline capacity, the types of projects that are built, producer netbacks, and customer prices. These changes will affect the core business of the pipeline companies themselves most directly. These changes are likely to include:

- commodity trading in pipeline capacity
- a shift to shorter-term contracts
- growing risk exposure for pipeline companies
- new opportunities to provide services for increasingly sophisticated customers
- a difficult market for new major pipeline construction projects
- clearer price signals
- shifts in pipeline ownership.

The good news is that new opportunities are associated with this increased risk, especially for companies that can respond effectively to new needs of customers.

CHAPTER 1
UNDERSTANDING THE DRIVERS

The natural gas industry in the United States has been undergoing major changes that are reshaping traditional roles, creating opportunities for new participants, and redefining the scope and character of government regulation. As a result of initiatives at both the federal and state level to further "unbundle" gas sales and create more competitive end-use markets, gas customers have seen, and will continue to see, significant changes in how they purchase their gas supplies.

These changes have resulted in a fundamental transformation in the market and relationships within the industry. In the new environment, producers, pipelines, and Local Distribution Companies (LDCs) are all competing for the same customers. The changes in market structure are the result of the interaction of two fundamental driving forces:

- regulation
- competition.

These two forces have already transformed gas into a commodity, and are in the process of transforming capacity — the ability to transport the gas — into a traded commodity as well. Already, the number of sellers of capacity has grown from the interstate pipelines to include hundreds of LDCs, producers, and end users. This expanded universe of sellers has resulted in surplus capacity being competitively bid into the new marketplace, depressing the price of transportation in most major markets for much of the year.

1.1 REGULATION

In the United States, the utility industries have been moving from privately held companies that are highly regulated monopolies to competitive markets with little or no regulation: over the last 20 years, the same dynamics have occurred in the telecommunications, railroad, trucking, banking, and airline industries.

Regulation in the natural gas industry has been a key driver for almost 60 years, since the passage of the Natural Gas Act in 1938 which established the regulatory framework for the interstate natural gas industry. From the passage of the Natural Gas Act until the mid-1980s, the primary direction in the industry had been toward more regulation, not less. However, this began to change in the early 1980s, when the Federal Energy Regulatory Commission (FERC) issued Order 436, which required pipelines to provide transportation on an open access, nondiscriminatory basis. Changes continued at the federal level with the issuance of Order 636

in 1992, which prohibited pipelines from providing bundled city-gate service. Significant changes at the state level to further "unbundle" gas sales are now being considered. The changes in industry structure are shown in Figure 1-1.

The regulatory movement at both federal and state levels toward increased competition in the natural gas industry is being driven by three fundamental forces:

- continuing regulatory and public policy enthusiasm for the substitution of competition for traditional cost-of-service regulation
- increased fragmentation and sophistication of the pipelines' customer base
- evolving market dynamics and market structures that are changing the way pipeline capacity is valued and priced.

However, the restructuring of the pipeline industry has, for the most part, been limited to deregulating gas as a commodity. The transportation function, as well as transportation pricing, is still regulated as a monopoly, as evidenced by cost of service pricing and tight control over system expansions and construction of new pipelines.

The regulatory environment for pipelines is restrictive in several other important areas as well:

- current regulations limit the pipelines to operating the transmission facilities as a regulated monopoly

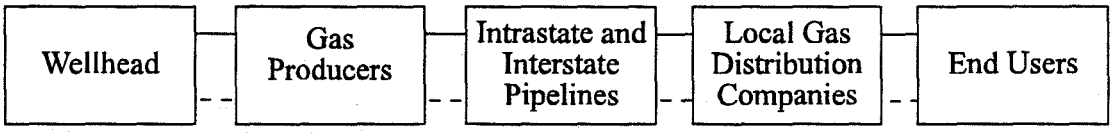
Interview Comments

Comments received in the interviews with industry executives regarding pipeline negotiation of service terms and conditions with individual customers (the FERC negotiated/recourse rate policy) reveal a wide range of views.

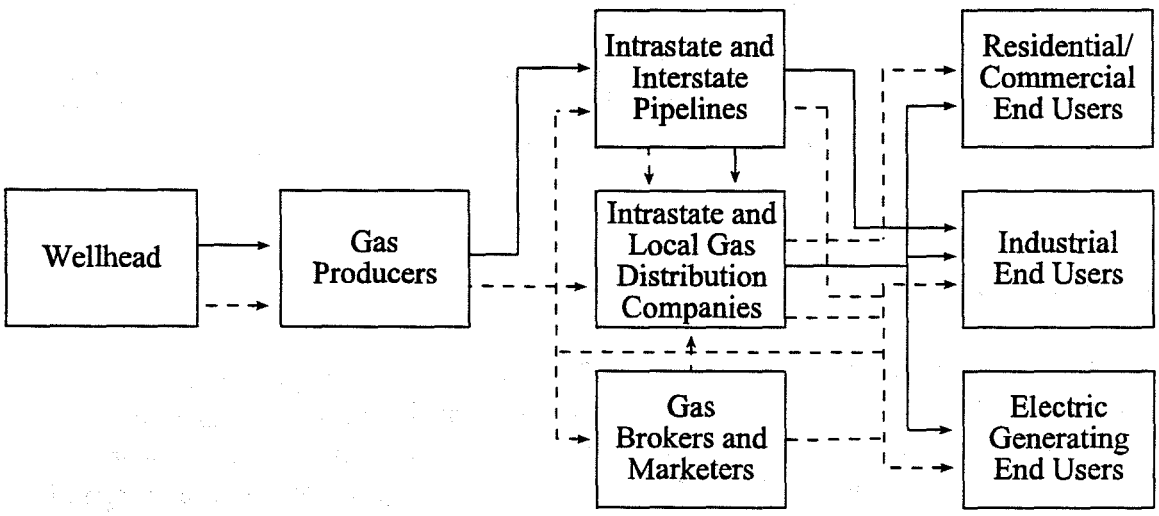
- Most pipeline executives strongly supported the continued evolution of FERC's negotiated/recourse rate policy to include customized terms and conditions of service. The reasons cited include:
  - the increasing competition faced by pipelines from one another, from nonjurisdictional companies, and from other fuels
  - flexibility to meet individual customer needs.
- Industrial gas customers generally opposed any negotiation of terms/conditions of service with individual customers by pipelines possessing market power. In the absence of market power, they would support negotiation if the pipelines provide recourse rates.
- Producers, although generally in agreement with the industrial customers, differed somewhat in degree. Producers generally feel that:
  - Negotiated terms/conditions should be permitted only in limited circumstances such as with incremental new customers with unique circumstances.
  - Negotiated terms/conditions must be accompanied by filing requirements and numerous other safeguards.
- Major LDCs generally supported authorization of negotiated pipeline rates, provided that safeguards are adopted to protect recourse customers from cost shifting, service degradation, and undue discrimination.

Figure 1-1
Structural Changes in the Natural Gas Industry

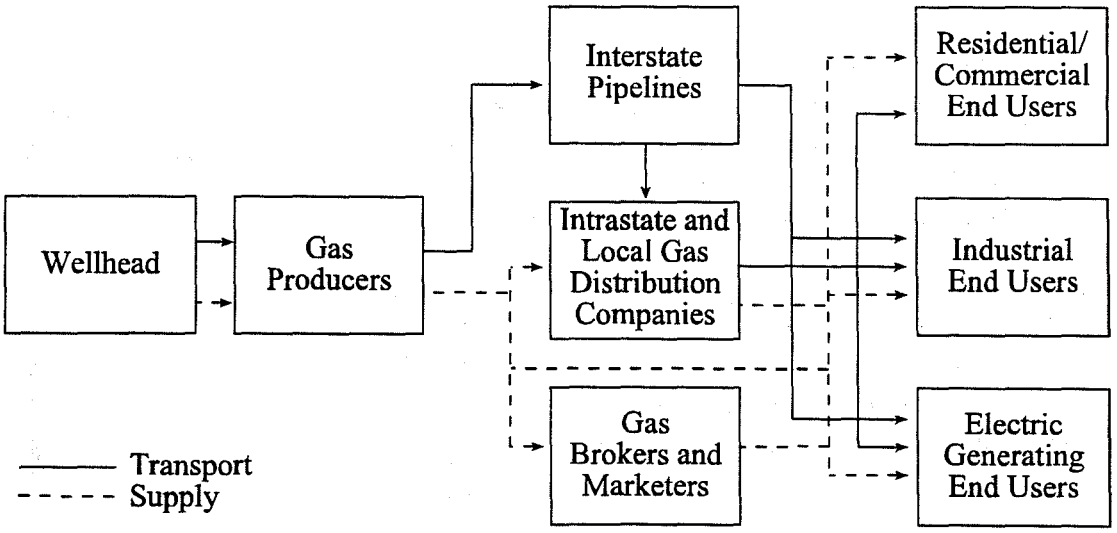
The Natural Gas Industry Pre-1985



The Natural Gas Industry Circa Mid-1980s



The Natural Gas Industry after Order 636 Implementation



- pricing flexibility is largely limited to options within the framework of the straight fixed variable (SFV) rate design

- construction of major facilities is limited to fully subscribed projects that can be supported by shipper contracts.

A new federal regulatory policy permits a pipeline that can prove that it lacks market power to charge market-based rates. If the pipeline does not meet the competitive test for market-based rates, the policy also permits pipelines to charge individually negotiated rates that vary from SFV subject to the availability of a FERC-approved recourse rate. Thus far, several companies have received approval to charge market-based rates for storage or hub facilities, and a growing number of companies are implementing negotiated rates.

Settling cost allocation questions resulting from the marketing of unsubscribed capacity has also proven to be a difficult proposition. Recent FERC policy to not allow reallocation of all costs for turned back capacity to remaining customers has further frustrated pipelines' ability to recover fixed costs.

1.2 COMPETITION

Competition in the natural gas industry, once circumscribed by regulatory and geographic constraints, is being replaced by a much more ruthless and less forgiving form of competition. Natural gas pipeline companies are facing increased competitive pressures not only from their traditional competitors such as other pipelines and alternative fuels, but also from a broad range of emerging and aggressive market participants. Many of these new competitors, such as energy service companies and Btu marketers, are moving well beyond providing end-use customers with commodity and transportation services, to bundling sophisticated packages of energy products with tailored energy service offerings.

A new competitive dynamic is emerging in which pipelines will have to effectively respond to a large and growing set of competitive threats. These threats, while interrelated, can be grouped into three broad categories, as shown in Figure 1-2.

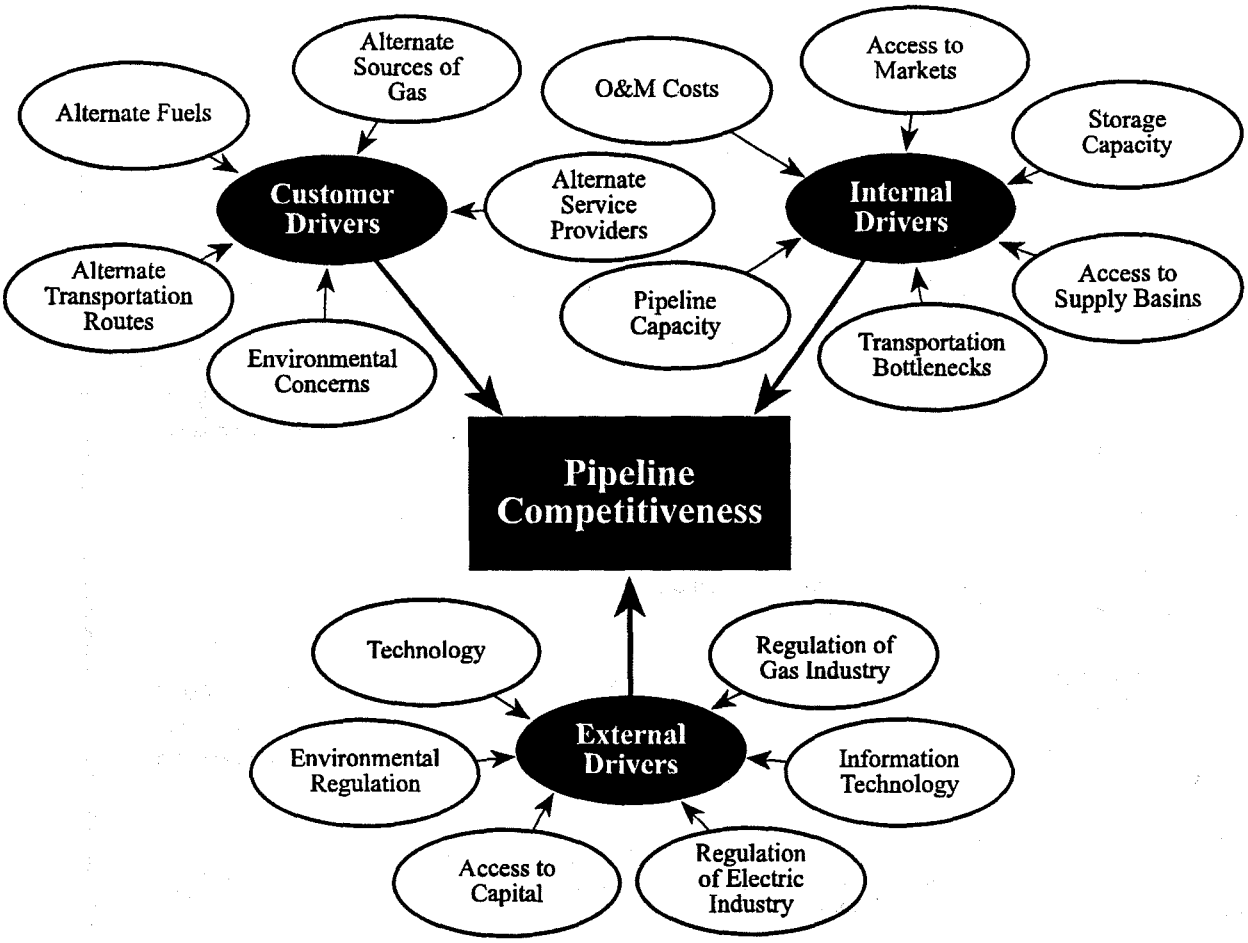
- ***Customer Drivers.*** The rapidly fragmenting customer base and the growing menu of energy and energy service options have moved "understanding the customer" from the realm of marketing slogan to a critical element of success.

Interview Comments

Some of the service offerings identified include:

- Btu contracts
- risk management services
- deal management
- balancing
- back-up supply
- nominations.

Figure 1-2
Competition: The New Landscape for Pipelines



- ***Internal Drivers.*** The significance to the pipeline industry of a market in which system expansions and operations decisions are driven by market dynamics, and not by regulatory constructs, is difficult to overestimate. It has already fundamentally altered who controls and pays for new pipeline capacity and the types of projects that are built.

- ***External Drivers.*** Pipeline operations, investment, and financing will continue to see fundamental changes as capacity transforms from its traditional status as a regulated fixed asset to a traded commodity.

The natural gas industry is responding to these forces by experimenting with a host of business strategies: aggressive efforts to reduce costs, corporate restructuring, creation of nonregulated marketing subsidiaries, strategic alliances, and consolidation through mergers and acquisitions.

Emerging from these changes is a more diversified and, above all, much more competitive industry. It is an industry that during the next several years could change from its recent role of providing a limited number of supply and transportation options to their customers to a more heterogeneous structure where gas is delivered to end-use customers under myriad new business and contractual arrangements.

THE CANADIAN EXPERIENCE

Background

Owing to differences in the Canadian institutional environment, Canada's experience in deregulation has not been entirely parallel to the United States. In particular, the extent of competition among pipelines is considerably less. TransCanada PipeLines (TCPL) is the only major gas pipeline that connects the Western Canadian Sedimentary Basin to eastern markets. Capacity on TCPL is currently constrained, leading to higher rates of pipeline utilization. The result is higher rates in the secondary market because there is less capacity to release.

Canadian restructuring policy can be traced to two 1985 intergovernmental accords:

- The Western Accord on Energy Pricing and Taxation
- The Agreement on Natural Gas Markets and Prices.

These agreements were intended to create the conditions for a market-responsive system characterized by new choices for buyers and sellers. They provided a framework for negotiated prices between buyers and sellers, and also permitted distributors some ability to ratchet down their wellhead contracts as customers shifted to direct purchase.

Since gas industry restructuring began in Canada, significant changes in both sales and transportation contracting practices have given market participants greater choice and flexibility in managing their natural gas supply and transportation portfolios. The result is a more competitive and integrated North American market.

Pipelines

The secondary market for natural gas transportation in Canada has evolved rapidly, raising some concerns about the way it is regulated. Consequently, over the past few years the rules governing trading of transportation services were reexamined by the National Energy Board (NEB) for the four major natural gas pipelines in Canada: Alberta Natural Gas Company Ltd. (ANG), Foothills PipeLines Ltd. (Foothills), TCPL, and Westcoast Energy, Inc. (WEI).

The emergence of an active secondary market resulted in tariff amendments by pipeline companies, which increased shippers' flexibility in choosing transportation services. The public policy goal is that the primary market should lead to the economic development of natural gas transportation infrastructures through commercial agreements, and the secondary market should ensure an optimal use of pipeline systems. This is to be achieved by the transfer of unneeded capacity from primary holders to willing buyers, which can reduce variances in demand and the need for pipeline expansions.

THE CANADIAN EXPERIENCE (cont.)

In Canada, virtually all industrial load has gone to the transportation service. In 1994, the capacity traded on the secondary market represented 5-10% of total capacity on the Canadian natural gas pipelines, including the NOVA system. Although these pipeline companies currently allow assignment of excess secondary capacity, the secondary market is not equally developed on all pipelines. Moreover, the current system is not completely transparent, since releasing shippers are not required to post their capacity, which can be traded informally. This means that not all shippers have equal access to information on released capacity.

In the secondary market in Canada, there are no price caps and no posting requirements. Until January 1, 1996, the excess revenue above the regulated rate for interruptible transportation was allocated back to the firm customers. After January 1, a four-year, performance-based, ratemaking-based settlement was implemented in which TCPL retains one-third of the revenue over $12 million, and a 50-50 sharing of cost savings between the pipeline and customers.

TCPL was active in developing its tariff to encourage the transfer of transportation rights on its system to third parties. In fact, TCPL was the first regulated pipeline to provide such provisions in its tariff.

Unlike TCPL, ANG is in the early stage of secondary capacity development because few shippers were on-stream before late 1993. The number of shippers on ANG increased from 3 to 40 as a result of the November 1993 expansion and the termination of the Alberta and Southern gas sales contract with PGT. Consequently, ANG implemented, effective November 1, 1993, a third party assignment policy that is more flexible. In 1994, ANG concluded more than 30 contracts for temporary reassignments of capacity.

In the case of WEI and Foothills, their tariffs only permit assignments with their approval. TCPL, WEI, NOVA, and Tennessee Gas Pipeline developed in 1994 an electronic trading system called the NrG Highway, through which transfers of capacity may be posted. It provides shippers with immediate access to information on available capacity and facilitates the trading of this capacity among shippers. The system has been in operation since December 1994.

NEB Review

As a result of these developments in the secondary market, the NEB issued a discussion paper in July 1994. The paper questioned whether the NEB should ensure a transparent and open-access secondary transportation market.

In its discussion paper, the NEB proposed standardizing transportation services in the secondary market along two principles:

- All shippers should be given an equal opportunity to obtain capacity.
- Capacity should be traded so that the pipeline is fully optimized and shippers with the greatest need for capacity can obtain it.

The NEB asked parties whether ANG, Foothills, TCPL and WEI should be required to establish an electronic trading system on which all capacity transfers must be posted, and whether the current restriction on selling capacity on the secondary market at prices above the regulated price should be removed.

THE CANADIAN EXPERIENCE (cont.)

Intervenor Comments

More than 35 interested parties responded to the NEB's discussion paper. Most parties argued that the price cap should be removed to allow a fully competitive secondary market, but that shippers should not be forced to post their capacity on an electronic trading system. They also stated that there was no need for the NEB to specify a date to set up an electronic trading system.

NEB's Decision

The NEB's February 3, 1995, decision concluded that the secondary market has been working well without any regulatory oversight and that it should be allowed to continue to evolve according to the needs of its users. It declared that requiring the posting of all available capacity and the establishment of an electronic trading system by a specific date was not necessary. It also removed the price cap on selling rights to transportation at a price above the regulated toll in order to ensure that available capacity is allocated to shippers who value it highest.

The NEB concluded that the secondary market is working well and that the natural gas industry does not want regulations imposed on this market. Its decision reflected the industry's views regarding an unregulated secondary transportation market in Canada. The decision to remove the price cap on transactions will increase economic efficiency by allowing parties to signal the true value of the capacity. This decision should therefore promote a more competitive market.

Canadian LDCs

The province of Ontario became Canada's pioneer in retail access with a 1987 decision of the Ontario Energy Board to allow marketers direct access to residential markets free of substantial regulatory oversight. The principal mechanism enabling direct access became known as the "buy/sell" arrangement, in which an LDC takes title to a marketer's gas at the city gate, and bills the marketer's direct purchase customers in the same manner as traditional retail customers. The marketer then rebates its direct purchase customers the difference between the LDC's gas cost and the marketer's gas cost (less the marketer's fee). From the pipeline perspective, it is noteworthy that the marketers who entered this market in Ontario were not the established aggregators and brokers, but new entities who wanted to build niche services at the residential level.

In March 1995, the province of Alberta eliminated the last element of its "Core Market" policy, which was implemented after the deregulation of natural gas prices in 1985. The province will now permit core market consumers to purchase natural gas directly from producers or marketers.

The Alberta government's previous policy denied small customers the right to buy gas directly from producers or marketers, and permitted access to direct sales only to large industrial users. Alberta also used its removal permit system to prohibit direct sales by producers/marketers to core market customers outside Alberta.

THE CANADIAN EXPERIENCE (cont.)

Security of supply and the inability of small consumers to use alternative fuels were the main arguments put forward by the Alberta government to justify its policy. However, several parties believed that the policy was meant to maintain higher gas prices.

In 1991, the Alberta government decided to lift the restriction against direct sales to small volume industrial consumers. In September 1993, it also ended this restrictive policy for core consumers outside of the province. Following these amendments, only core market consumers inside Alberta were unable to purchase natural gas directly from producers and marketers. Instead, these consumers, who accounted for approximately 20% of all the natural gas consumed in the province in 1994, had to rely on LDCs for their supply requirements. This lasted until March 1995, when the government decided to permit direct gas sales to the core market consumers.

Not every province adopted a core market policy.

- Saskatchewan did not use its gas removal permit system to enforce any core market restrictions. Instead, it took advantage of Alberta's core market policy, and targeted the eastern Canada core market.
- British Columbia also benefited from Alberta's policy, since it did not impose its internal core market policy outside the province. In May 1993, the British Columbia Utilities Commission introduced new rules allowing core market customers, within the province, to buy their gas directly from producers or marketers.
- The province of Quebec followed Alberta's initiative by implementing a core market policy for its small consumers.

Impact

As a result of the decision to remove the core market policy, small users of natural gas in Alberta have the option of either continuing to be supplied by their local utility company, or of purchasing gas from another supplier. Customers who opt for the new option must ensure that their supply contracts, which must be for at least one year, will give them an adequately secure supply. Should they decide to return to the LDC for their natural gas supply, they must then remain with the utility for at least one year.

This change in Alberta's regulations may not be as attractive for small customers as it would have been in the past, since the price differential between LDC supply and the short-term contract price is currently very small.

THE CANADIAN EXPERIENCE (cont.)

Conclusion

The Canadians, particularly in Alberta, have moved further than the United States in unbundling retail gas sales. However, because there is a limited amount of capacity to release, the development of the secondary markets has progressed less quickly than in the United States. As capacity becomes less constrained, the liquidity will increase.

1.3 TRANSFORMATION OF TRANSPORTATION INTO A COMMODITY

Transmission capacity is going the way of natural gas itself — it too is being transformed into a traded commodity. Order 636 made it possible by unbundling and separately pricing pipeline services and establishing a secondary market in capacity. The closer that transport capacity becomes to a true commodity, the greater the chance that new gas markets will be unlocked by enhanced reliability and lower overall delivery cost. These changes, of course, will affect the core business of the pipeline companies themselves most directly.

The emerging market is placing greater emphasis on short-term rather than long-term contractual agreements. Such short-term contracts and capacity release facilitate constant matching of supply to demand. At the same time, the secondary market in transportation competes directly with pipeline interruptible transportation.

The expanded universe of sellers has resulted in surplus capacity being competitively bid into the new marketplace, depressing the price of transportation into most major market areas for much of the year. Surplus capacity will support a spot market for much of the year. Coupled with SFV, the incentives to avoid demand charges will only intensify.

Primary Firm Markets Are in Flux

What is currently competition in the interruptible markets is entering the firm market. Unbundling and deregulation behind the city gate are gaining momentum in state regulatory agencies. Many LDCs have adopted full unbundling as a corporate goal in advance of regulatory requirements. As a result, many LDCs are reexamining the way they purchase firm capacity.

This is already happening in California, where gas power plant divestiture will potentially strand electric utility contracts for long-term firm capacity. A portion of the revenue may be recovered in the release market, but probably not all.

Secondary Market

There are several types of capacity trading on the secondary markets — released, rebundled sales, and trades of interruptible transportation (IT) and short-term firm by the pipelines. There are several ways to trade capacity:

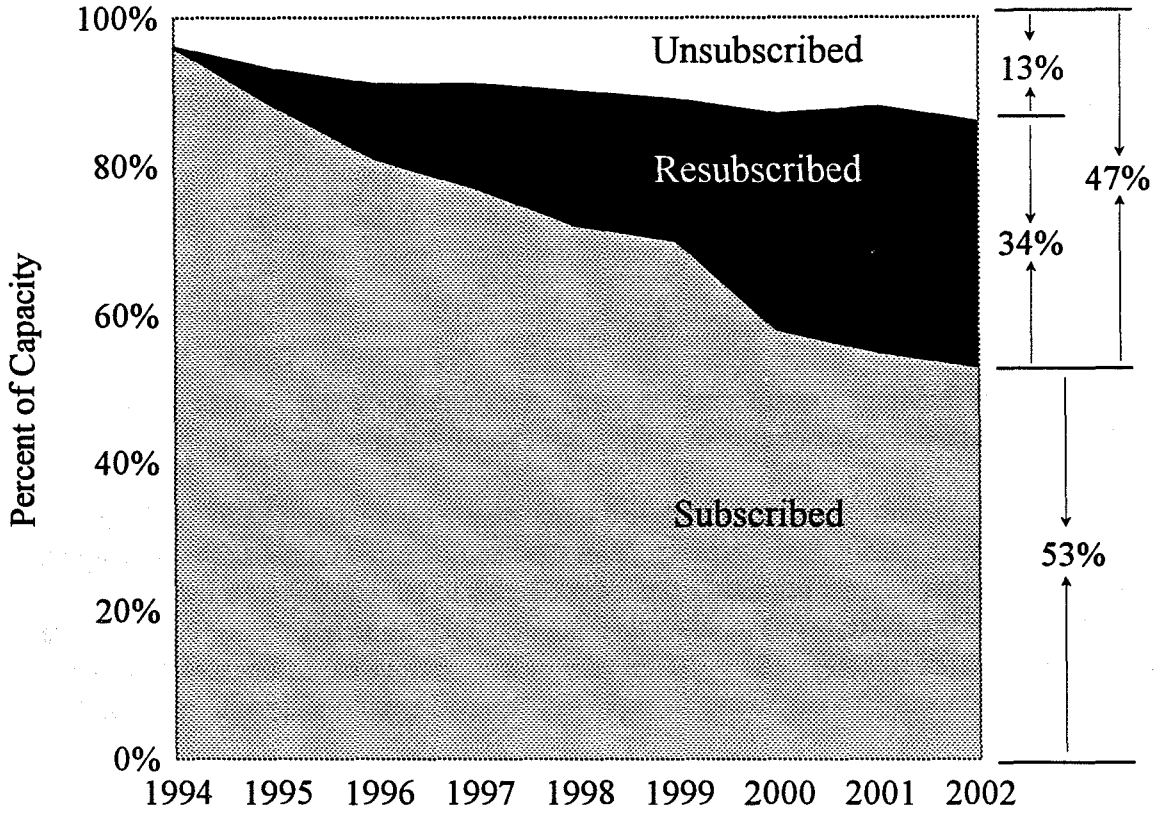
- Posting availability on pipeline electronic trading systems and accepting bids from interested parties via the trading systems.
- Finding a buyer privately and bringing the pipeline a "prearranged deal" that must be posted on the pipeline electronic trading systems after the deal is done.
- Obtaining capacity directly from the pipeline.
- Capacity holders bundling interstate capacity and gas supply for a specific customer. These "rebundled sales" are not currently subject to FERC regulation.

There are several problems with capacity release that are currently the focus of FERC reform efforts. Released capacity is usually for short periods of time and often contains clauses specifying "recall rights" that constrain the operational flexibility and rights to use the capacity by those acquiring the capacity. Payment terms have much flexibility (as long as sellers do not charge more than pipeline maximum tariff rates), but SFV can be very unattractive to LDCs because they have to commit to long-term capacity requirements to serve future customers' needs, which may not materialize.

"Shake-Out" of Capacity Holdings

As pipelines continue to have to increasingly compete with capacity in the secondary market, there will likely be a continued shake-out in capacity holdings. An INGAA survey of interstate pipelines estimates that the amount of primary firm capacity under long-term contracts will decline by 2002, as illustrated in Figure 1-3. The INGAA study found that about 96% of pipeline capacity was under firm contracts in 1994, which included 4% under short-term contracts. Contracts for nearly half of pipeline firm capacity will expire between 1995 and 2002. Almost three-fourths of this capacity is expected to be resubscribed under long-term arrangements. Between 1994 and 2002, the amount of contracted firm capacity is expected to decline from 96% to 87% of total capacity. Thus the amount of unsubscribed capacity is projected to increase from 4% to 13%. Long-term firm contracts will also be of shorter duration. Over half of the resubscribed capacity will be for contract terms of 4 years or less.

Figure 1-3
Cumulative National Firm Capacity Outlook



Source: INGAA Survey.

A movement away from traditional long-term firm contracts is consistent with recent changes in the gas transportation market. But pipelines, customers, and regulators will have to work together to develop innovative means for effectively dealing with the issues surrounding unsubscribed capacity. For instance, the appearance of shorter term contracts on the interstate grid will affect the pipelines' cost of long-term debt.

Producer netbacks will also be affected as producers and pipeline capacity holders compete for shares of the competitively determined city-gate price of gas.

CHAPTER 2
IMPACTS ON THE PIPELINE INDUSTRY

The development of more competitive markets for pipeline companies will have a fundamental impact on the future structure of the entire gas industry and on company strategies. As competition intensifies, it will have several critical strategic implications for the structure and functioning of the entire natural gas marketplace:

- ***Sources of Capacity Price Discovery.*** A new playing field for capacity price discovery has emerged where prices are reflected through two separate arenas.

- ***Constraints to a Mature Capacity Market.*** To increase the liquidity and trading effectiveness of the marketplace, several obstacles will have to be overcome.

- ***Investment and Financing.*** Low market prices for capacity and high demand charges are driving significant changes in the economics of new facilities construction.

2.1 SOURCES FOR CAPACITY PRICING DISCOVERY

The value of transmission capacity in the secondary market is currently determined through two separate arenas: implicitly by the difference in the market value for natural gas in separate locations — basis differentials — and explicitly by the secondary market for interstate capacity. It is important to note that, sweeping regulatory changes notwithstanding, most capacity will continue to be priced under regulated rates.

Secondary Market Trading. The more direct method of measuring the price of transmission capacity is through capacity release. Mandated by FERC Order 636, LDCs and other holders of pipeline capacity post the availability of capacity for auction, and recover a portion of or all of their demand payments to the interstate pipelines from replacement shippers.

Interview Comments

The term "basis differentials" was used to denote several different concepts by the interviewees. In this study, it is defined as follows:

Basis differentials are commonly defined as the difference between the NYMEX Henry Hub price and a specific pipeline index. Indeed, many gas purchase contracts express these basis differentials relative to the Henry Hub. There is also a growing derivative and swap market which links the future value of pipeline capacity to a Henry Hub price. The number of industry participants that are actively following the volatile basis differential market is increasing rapidly.

In the more liquid capacity markets such as into New York, Chicago, and California, and especially in the off-peak season, this marketplace has changed historical pricing relationships.

Neither basis differentials nor trading provides perfect information on the value of pipeline capacity: The former represents the relative price of the gas itself, and the latter reflects the price for the entitlement to transport services. In addition, the increasing prevalence of "gray market" transactions (bundled supply and transport service) means that the price/value of some deals goes undiscovered.

Currently, basis differentials provide the most responsive indicators of the short-term value of capacity, with daily price swings responding, often instantaneously, to short-term market conditions. Monthly and longer-term capacity trades generally respond to longer-term judgments of future market fundamentals and capacity availability. As a result, the spot market basis differentials and the quoted values for pipeline capacity can diverge, particularly in markets with limited spot market trading.

The proper price signals for pipeline capacity will do more than signal short-term opportunities in local markets: they will help restrain the growing risk exposure for traditional pipeline companies from the fundamental change in the valuation of capacity. In an environment where capacity values are increasingly determined in the secondary market, the importance of accurate and timely price signals will help guide system expansion and strategic planning decisions.

2.2 CONSTRAINTS TO A MORE MATURE CAPACITY MARKET

The divergence in the short-term and longer-term capacity pricing mechanisms is exacerbated by numerous impediments to capacity trading in the secondary market, such as restrictions on rolling over prearranged deals, the cap on traded prices, and inconsistent information about capacity values obtained from pipeline electronic trading systems.

Several major developments in the industry are likely to be required to increase the liquidity and trading effectiveness of this marketplace:

- ***Relaxation of Capacity Release Restrictions by the FERC.*** By setting the maximum capacity release price at the pipeline's maximum tariff rate, the FERC has encouraged capacity holders to consider alternatives to posting and bidding under FERC rules, such as growing "rebundled sales" markets.

- ***Improved Flexibility through Hubs and Market Centers.*** The addition of numerous hubs will add to the flexibility of the grid and the competitiveness of the capacity market.

- ***More Compatible and Comprehensive Information and Trading Systems.*** The standardization of information and transaction formats will help remove some unnecessary technical and operational barriers in the capacity marketplace.

- ***Overcome Financing Obstacles.*** The financial community will have to reassess the way they analyze pipeline companies to become more comfortable with financing pipeline projects without the benefit of long-term, tariff-based revenue streams.

Interview Comments

Several interviewees commented that the secondary market was already deregulated under certain circumstances — the so-called "gray market." In a capacity constrained market, the customers were forced to pay a supplier a price significantly above market for gas in order to use the supplier's firm capacity to move the gas to the customer. In effect, the supplier was able to capture the true value of the transportation service, or a rate in excess of the maximum transportation rate on the pipeline's system by shifting the premium from the transport rate to the cost of the gas.

- ***Regulatory Flexibility.*** The regulatory approval process for innovative market-based pricing must become more responsive to the individual circumstances of different pipelines and not continue to dictate "one size fits all" rules and procedures.

2.3 MARKETS MOVING TOWARD CONVERGENCE

As the secondary markets mature, transmission capacity in major supply corridors will become increasingly like a commodity, with basis differentials and pipeline capacity values converging.

Although basis differentials and the capacity values as reported on pipelines' electronic trading systems operate separately today, they will eventually converge as a result of increased competition.

- Improved reporting of capacity values will better pinpoint market signals about capacity availability or constraints, and will allow the industry overall to respond more quickly to changes in both supply and demand.

- Prices for interruptible transportation are no longer tied directly to costs; they are set on the secondary market as pipelines fight for customers.

The competitiveness of specific markets will be both driven and limited by market liquidity, with capacity in major transport corridors freely traded and reliably priced, and with values in less traveled corridors having more volatility and price differentiation. As a result, the pipeline business will look more and more like other capital-intensive businesses that experience volatile price changes for their products.

Interview Comments

Several LDCs and large industrial customers expressed concerns about the potential for producers to exert considerably more market power in the future, comparable to the market power of the pipelines prior to restructuring. Formerly, pipelines exerted a significant amount of market power because they owned the physical facilities necessary to transport natural gas, and controlled the supplies through contractual arrangements. The concern from interviewees is that a similar level of market power could be amassed by producers/suppliers through contracts for capacity and supplies.

Although the pipelines continue to own the physical transportation facilities, the capacity is controlled through contractual arrangements by pipeline customers, mainly LDCs. The result is a delicate balance in power between:

- the pipelines who own the facilities
- the LDCs who control the facilities
- the producers, who control the supplies.

The conventional wisdom is that retail unbundling will result in LDCs relinquishing rights to capacity on upstream pipelines because they will be reluctant to commit to long term-firm capacity for customers they may no longer serve through a bundled service. If producers/marketers would sell gas to customers on the LDC's system, they would likely have to replace the LDCs as the holders of the upstream capacity. If this were to occur on a large scale, the producers/marketers could be in a similar position with regard to market power as the pipelines were prior to restructuring. The potential shift in market power is depicted below.

Potential Shift in Market Power

	Capacity	Supply
Pre-Restructuring	Owned and controlled by pipelines	Owned by producers Controlled by pipelines via contracts
Current	Owned by pipelines Controlled by LDCs & other contracts	Owned and controlled by producers
Potential	Owned by pipelines Controlled by producers via contracts	Owned and controlled by producers

2.4 DOWNWARD PRESSURE ON THE PRICE OF TRANSMISSION CAPACITY

The nature of the marketplace has changed from one in which a few sellers have incentives to keep the price high to one in which an expanding array of buyers and sellers has competitively bid prices down in all but the most capacity constrained market.

The declines in capacity prices have not occurred because of market weakness — indeed gas demand is at the highest level in nearly 20 years. Rather, the changes have occurred because the nature of the market has changed. With a much greater number of potential buyers and sellers, the market for capacity is increasingly behaving like markets for many other commodities, with rapid swings in prices, ongoing cycles, and a price playing field bounded by the market values of alternatives, rather than by the cost of providing the service.

The early activity in capacity trading has resulted in off-peak secondary market prices that range from only pennies above the variable transport rate (into the Midwest) to approximately 50% of the maximum allowed rate (into the Southeast), well below the current maximum pipeline rates through much of the transmission system. The expanding number of firm capacity sellers, and continuing competition from the interstate pipelines' interruptible transport, have increased downward pressure on off-peak transport rates.

As the markets for firm capacity develop more fully, the open market price of capacity on specific pipeline segments will drive customers' actual transport costs, and influence both burnertip prices and producer netbacks. The upper end of prices will be limited by the availability of alternatives to firm transportation such as storage, liquefied natural gas, and alternative fuels. The minimum value will fluctuate around the marginal fuel costs.

Interview Comments

Although the price of capacity has occasionally exceeded maximum allowed rates during the peak demand months into relatively constrained markets such as the Northeast and Mid-Atlantic states, annual average transport rates have declined sharply in most market areas. A recent FERC analysis concluded:

- Of the more than 30,000 capacity release awards tracked by FERC from June 1994 to June 1996, about 85% were at a discounted rate, with most of the discounts being applied to the reservation rate.
- The discounts have a clear seasonal pattern: 94% of awards were discounted in the summer months of June and July, and only 67% were discounted in the winter months of January and February.
- The discounts are quite deep. Replacement shippers paid an average of 27% of the maximum rate.

The original pipeline costs, currently the basis for pipeline ratemaking, are likely to play little or no role in determining the market-driven values in the future.

2.5 INVESTMENT AND FINANCING

The development of an active secondary market in pipeline capacity has altered the market environment for new pipeline construction. Although several projects are going forward, it is in general a much more difficult environment to get firm shipper commitments to large projects.

Interview Comments

- The low annual average value of pipeline capacity on the secondary market has made potential buyers much more cautious in committing to new pipeline construction.
- Regulatory changes at the state level, particularly unbundling LDC sales, have undercut the willingness of LDCs, the principal holders of long-term firm capacity, to commit to new projects.
- The costs of new storage, LNG, interruptible service, and alternate fuel capability are being compared not only to the cost of new construction, but also to the cost of maintaining existing low load factor long-haul pipeline capacity.

Low market prices for capacity and high demand charges are also driving changes in the economics of new facilities construction. The result is a much more market-oriented, and difficult, environment for new pipeline construction.

The end result is a market-based rationalization and better utilization of existing infrastructure. Increased sophistication in the capacity markets will isolate higher value pipeline segments and will attract construction designed to relieve specific bottlenecks rather than create new long-haul capacity.

With a more liquid and effective secondary market for capacity, the most valuable and least valuable segments of capacity will become more isolated. In many cases, the most valuable segments are around very specific bottlenecks. With the growing financial risk associated with holding long-haul pipeline capacity, many new construction projects are now focusing on relieving these specific bottlenecks. Where bottlenecks are only seasonal in nature, pipeline construction will compete with storage, fuel substitution, or other forms of peak period demand management.

2.5.1 New Participants in Pipeline Construction

One of the major obstacles to new pipeline construction is the general market reluctance to commit to capacity when the cost of the capacity is below current basis differentials. Yet basis differentials alone are unlikely to be the sole determinant of commitments to pay for capacity. Increasingly, investors are likely to be only those who need the capacity for more strategic purposes — producers and capacity merchants — where the overall project is profitable, even if the pipeline piece is not.

In the future, those who need capacity most, regardless of industry segment, will pay for expansion.

- Producers may pay to gain access to markets for increasing productive capacity and outlets for associated production.
- LDCs and end users are likely to remain the primary subscribers for segments downstream of market centers or storage.
- Marketers and capacity merchants are likely to control a growing share of natural gas pipeline capacity in North America.

CHAPTER 3
CUSTOMERS OF THE FUTURE

Understanding customer opportunities and needs is critical to developing the ability to provide "mass individualization" — the type of tailored product and service offerings customers reported in interviews they want from their energy providers. In creating solutions that customers value, the product development and marketing functions must be reinvented constantly, reflecting the fact that solutions do not have an absolute value, but a contextual value based on the customer's situation.

To understand the product and service offerings that customers want and need, and to enrich customers with solutions derived from commodity-type products, pipelines must build their understanding of the customers of the future:

- Who are they?
- What do they want?
- What affects their purchasing decisions?

3.1 WHO ARE THE CUSTOMERS OF THE FUTURE?

As the pipeline industry has evolved since the early 1980s, its customer profile has changed significantly: the number of customers has increased dramatically, and the type of customers has changed markedly. The evolution of the changes of pipeline customers is summarized in Table 3-1.

Although LDCs still hold more than two-thirds of firm capacity, there is considerable concern that retail unbundling of gas could vastly complicate the pipeline business. Pipelines will not only have to serve a growing and diverse set of new customers, but also compete directly with them for market share. Table 3-2 provides details on current holders of firm pipeline capacity.

The Fragmented Customer Base

In the post Order 636 environment, the pipeline customer base has become extremely fragmented as more customers are demanding services that fit their individual requirements. Even the old customer classifications of residential, commercial, and industrial are much too broad in today's environment. The fragmentation of pipeline customers is shown in Figure 3-1.

Table 3-1
Evolution of Pipeline Customers

Time Period	Market Description
Pre-1985	Limited number of customers ▸ LDCs ▸ Direct sales
Mid-1980s to Mid-1990s	Expanding number of customers ▸ LDCs ▸ Transportation customers ▫ Industrial and large commercial end users ▫ Aggregators — producers, marketers, gatherers
Mid-1990s to Late 1990s	Explosion of customers caused by LDCs unbundling ▸ Diminishing percentage of capacity held by LDCs as LDCs move toward transportation-only service ▸ Transportation customers ▫ Industrial and large commercial end users ▫ Smaller commercial and residential end users ▫ Aggregators — producers, marketers, gatherers
Late 1990s to Early 2000s	Diminishing number of customers ▸ Reduced capacity holdings by LDCs ▸ Aggregators consolidate groups of smaller commercial and residential customers ▸ Transportation customers ▫ Industrial and large commercial end users ▫ Aggregators — producers, marketers, gatherers

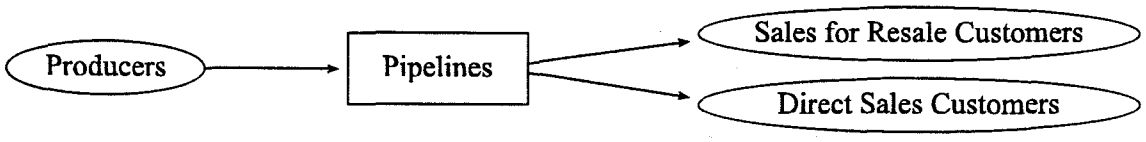
Table 3-2
April 1996 Pipeline Index of Customers by Type of Customer

Customer Type	Total MDQ (Mcf/d)	Percent of Capacity
Total LDCs	74,755,115	67.5%
Investor-Owned LDCs	69,196,990	62.5%
Municipals	5,558,125	5.0%
Marketers	15,783,184	14.3%
Pipelines	8,697,131	7.9%
End Users	7,873,034	7.1%
Producers	3,621,701	3.3%
Total	110,730,165	100.0%

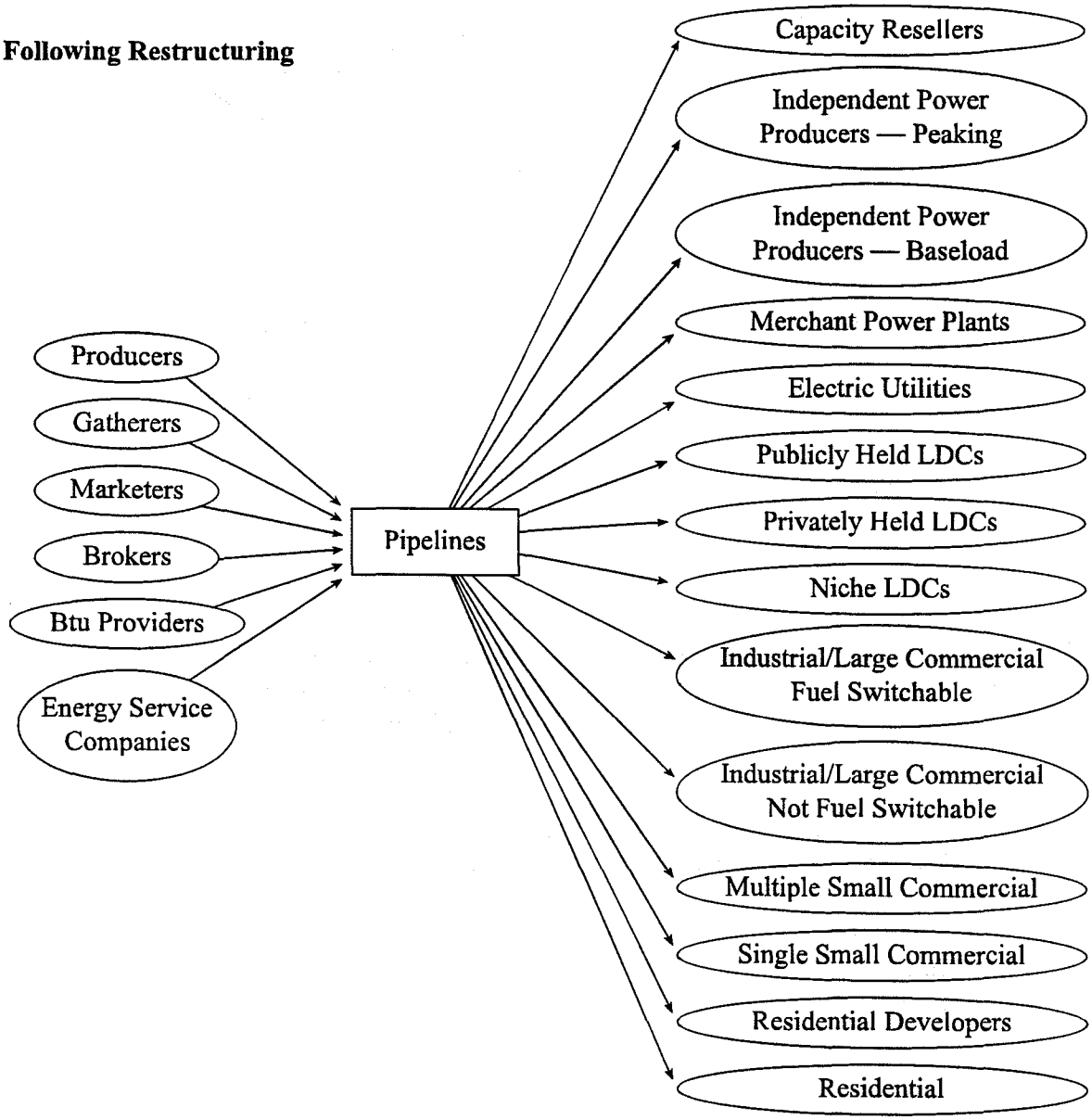
Source: Pipeline filings with FERC and TransCapacity.

Figure 3-1
Pipelines' Fragmentation of the Customer Base

Before Restructuring



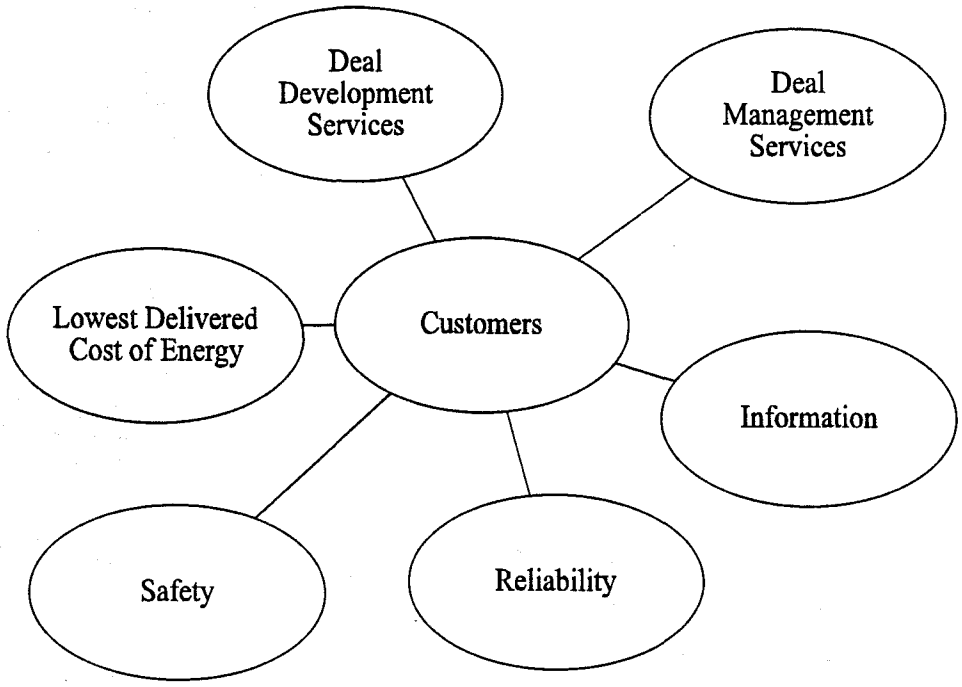
Following Restructuring



3.2 WHAT DO CUSTOMERS WANT?

When asked what services customers value in pipelines, the respondents' answers fell generally into six categories. These categories are shown in Figure 3-2 and detailed below.

Figure 3-2
What Do Customers Value?



- ***Deal Development Services.*** Customers want assistance in putting together energy and energy service packages that address their individual circumstances. In many cases, customers don't feel they have the expertise to design and implement the most cost-effective energy plan.

  - Those bringing buyers and sellers together.
  - Those that expedite the process of closing a deal:

    — financing
    — certification
    — connection
    — accurate metering data
    — services to evaluate contract economics.

- ***Deal Management Services.*** Customers want services that help them manage their energy needs, particularly in reducing the transactions costs associated with understanding the many supply options.

  - Those that keep supplies balanced with demand.

  - Real time knowledge of what is, and is not, flowing and what end users are burning is critical to a successful energy service provider.

  - Services pipelines can provide to customers:

    — balancing
    — back-up service
    — transaction management
    — gas flow data.

- ***Information.*** Many customers regard access to information on their pipelines as critical to success. Operational information on pipelines is becoming increasingly important, particularly for customers where profits and/or cost savings are closely tied to short-term changes in the gas markets.

  - The issue of real-time, integrated information is probably the biggest challenge for the industry.

  - Communication and information technologies are critical to customers.

  - Integrated sources of information support deal development and deal management services.

  - The Gas Industry Standards Board (GISB) was set up to address the barriers to information flow around the industry created by the unique requirements of each pipeline.

Interview Comments

The need for additional pipeline operational information was expressed, in varying degrees of forcefulness, by almost all interviewees. Some innovations are beginning to appear in the industry. For instance, TCPL is providing real-time access to certain operational information on their system to its customers through a dial-up facility, much as Federal Express allows its customers to track the status of a package through an online system. The TCPL information system includes data such as pipeline pressures, maintenance schedules, and other operational information valuable to shippers who need to understand the near-term outlook for secondary capacity. This information access has proven to be extremely popular with customers.

- ***Reliability.*** For many customers, the definition of reliability has changed. It used to mean the pipeline ensured that every customer received their full requirement of supply. Today it means keeping scheduled and accidental downtime to a minimum.
  - Responsibility has shifted to marketers and others who assemble physical assets to maintain a required level of service.
  - Reliability is no longer delivered uniformly to all, but tailored to the specific needs of each customer through special contractual arrangements.
- ***Safety.*** Customers regard safety and the integrity of the gas transportation system as a vital and uncompromisable component of pipeline service. Operating safely and monitoring pipe integrity will continue to occupy significant pipeline resources.
- ***Lowest Delivered Cost of Energy.*** Most customers still regard delivered gas price as one of the most important criteria used in evaluating competing supply options.

3.3 WHAT AFFECTS CUSTOMERS' PURCHASING DECISIONS?

Equally important to understanding what services customers value is understanding what factors affect customer's purchase decisions of energy products and services. These factors, which differentiate the pipeline customer segments of the future, are shown in Figure 3-3 and detailed in Table 3-3.

Key Future Customers

The following are three key customer groups that could provide valuable insights into how customers will purchase gas, and the market mechanisms that will become central to serving them.

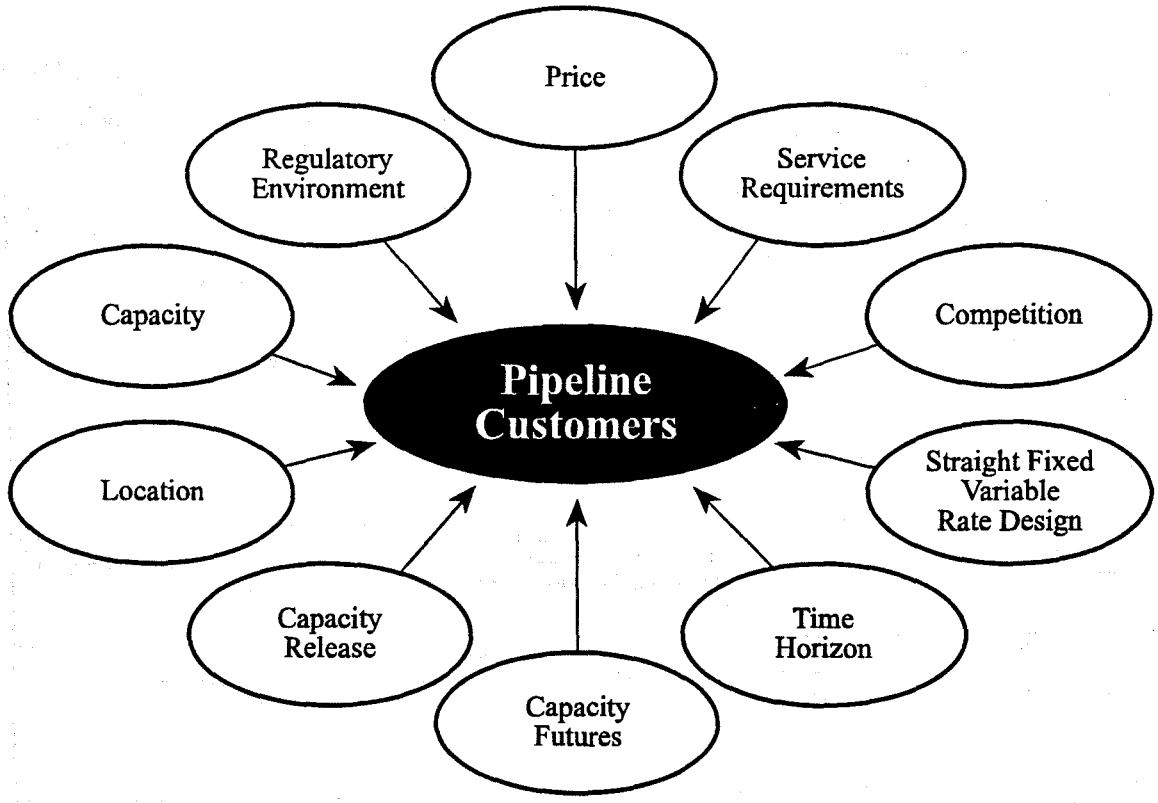
- ***Residential.*** May be supplied by niche marketers, as in Canada today.
  - Regional presence will be vital.
  - Strong brand equity will be required to expand customer base.

Interview Comments

Almost all pipeline customers that were interviewed expressed negative feelings about the quality of service they have received from their pipeline companies. Generally, their complaints fell into three categories:

- Lack of responsiveness to customer needs and fear of reduced choice in the future for smaller markets.
- Cost allocation — large customers with market options have the ability to reduce their costs, leaving smaller customers with an increasing burden of pipeline costs.
- Perceived laissez-faire attitude — "What do they care about who the customers are as long as the pipes are full?"

Figure 3-3
Factors Affecting Customers' Decisions



- ***Capacity Merchants.*** Resellers who try to match large volumes of capacity on several pipelines to exploit regional market differentials.
  - Strategic alliances could be the key to success.
- ***Energy Marketers.*** The convergence of gas and electric marketers.
  - Sophisticated marketers who have the ability to arbitrate difference in gas and electric markets will require extremely responsive and flexible service.

Table 3-3
Factors Affecting Customers' Purchasing Decisions

Factors	Capacity Resellers	Small Producers/Gatherers	Large Producers/Marketers	Independent Power Producers Peaking Units
Regulatory Environment	Unregulated, competitive environment.	Unregulated, competitive environment.	Unregulated, competitive environment.	May be comfortable with more flexible regulatory environment for transportation.
Price	Moderate price sensitivity. More concern on ability to price according to market.	Price sensitive. However, market for gas dictates ability to choose transportation alternatives. May sell into pool without arranging any transportation.	Very price sensitive. Profit motivated. Can move supplies on various pipelines to many locations.	Very price sensitive. Profit motivated. If have multiple plants, may be capable of moving supplies on multiple pipelines. Supplies usually connected to pipeline serving plant.
Service Requirements	Would act as marketers of pipeline capacity. Would likely out-source administrative and billing services.	Many sell into pools.	Sophisticated purchasers. Want unbundled transportation and storage services tied to individual customer's requirements.	Require large quantities of gas on short notice.
Pipeline Capacity	Would purchase a mix of firm and interruptible transportation and supply capacity.	If not selling into a pool, utilize firm & interruptible transmission and storage capacity, depending on their own requirements.	Utilize firm & interruptible transmission and storage capacity, depending on their requirements.	Need firm capacity for peaking units. May utilize interruptible capacity during non-peak periods.
Location	Would have multiple pipeline capacities and be able to market to suppliers and end-users.	Wells are location specific, but customers can be many locations. Need aggregation to overcome this.	Many customers in various locations on many different pipeline and LDC systems.	Each plant is location specific. However, some plants located near multiple pipelines.
Capacity Release	Would actively participate in capacity release market.	Most do not hold capacity on pipelines. May participate to package with supply for city gate delivered pricing.	Participate as sellers and purchasers of capacity release.	Units located near population areas so may participate in capacity release.
Capacity Futures	Would actively participate in capacity futures market.	May participate to hedge against price spikes.	Might participate in trading capacity futures on different pipeline and LDC systems. Might consider storage futures.	Capacity futures as hedging device may be attractive. IPPs with multiple plants might also participate.
Straight Fixed Variable Rate Design	Would act as bridge or hedge between SFV and market based pricing.	Will resist abandoning SFV because bulk of costs (fixed costs) now being carried by LDCs.	Will resist abandoning SFV because bulk of costs (fixed costs) now being carried by LDCs.	Mixed regarding SFV depending on whether using firm or interruptible capacity and financing source.
Competitive Environment	Very competitive. Capacity versus capacity competition. Aggregate capacity on pipelines, LDCs, and gathering systems.	Very competitive environment. No regulation, many gas suppliers.	Gas on gas competition is very keen. Many gas suppliers. Some customers and target customers (power generators) have alternate fuel capabilities.	Mixed. Many have fixed contracts with electric utilities. As electric utilities restructure some will be non-competitive.
Time Horizon	Short term pricing, but long term operating arrangements, with futures and capacity release participation.	Very short. Comfortable with 30 day pricing provisions.	Time horizon short. Comfortable with 30 day pricing provisions and short term (1 year and less) contracts.	Long time horizon. Prefer long term fixed price transportation contracts for financing reasons.

Table 3-3 (cont.)
Factors Affecting Customers' Purchasing Decisions

Factors	Independent Power Producers Base Load Units	Merchant Power Plant	Electric Utilities	Privately-Held LDC
Regulatory Environment	May be comfortable with a more flexible regulatory environment for transportation.	May be comfortable with a more flexible regulatory environment for transportation.	Operate in regulated environment. Many uncomfortable about industry restructuring.	Traditional LDC regulatory environment. Unbundling commodity from transportation to larger customers.
Price	Very price sensitive. Profit motivated. If have multiple plants, may be capable of moving supplies on multiple pipelines. Supplies usually connected to pipeline serving plant.	Very price sensitive. If have multiple plants, may be capable of moving supplies on multiple pipelines. Supplies usually connected to pipeline serving plant.	Sophisticated purchasers. Price sensitive. Many plants have dual fuel capability.	Price conscience. Concerned about reliability.
Service Requirements	Base load units require large quantities of gas on a more constant basis.	Base load units require large quantities of gas on a more constant basis.	Require large quantities of gas on short notice for peaking units. May consider gas for environmental reasons.	Depending on size, sophisticated purchaser. Will manage own supplies and capacity. Not interested in paying for bundled service if there is a premium.
Pipeline Capacity	Need firm capacity because units are base loaded.	Need firm capacity because units are base loaded.	Firm capacity for peaking units. May utilize interruptible capacity during non-peak periods.	Need firm capacity for its residential & commercial customers. Can utilize interruptible capacity for larger industrial customers.
Location	Each plant is location specific. However, some plants located near multiple pipelines.	Each plant is location specific. However, some plants located near multiple pipelines.	Each plant is location specific. Many, if not most, plants located on LDC systems, not pipelines.	Very specific. Strong concept of service territory.
Capacity Release	Units located near population areas so may participate in capacity release.	Units located near population areas so may participate in capacity release.	With plants located on LDC systems, and firm capacity required, would likely participate.	Rebundled sales may be offered by LDC anywhere along pipelines where it has contracts. Also sells into other markets through affiliates.
Capacity Futures	Capacity futures as hedging device may be attractive. IPPs with multiple plants might also participate.	Capacity futures as hedging device may be attractive. Merchant generators with multiple plants might also participate.	Capacity futures as a hedging device may be attractive. Firm capacity requirements and non-peak periods provide opportunity to sell capacity futures.	Because of state requirements, not likely to be a player in a capacity futures market. Some with multiple pipeline access may participate.
Straight Fixed Variable Rate Design	Likely using firm service and would support alternatives to SFV.	Likely using firm service and would support alternatives to SFV.	May support alternatives to SFV if it would reduce the fixed costs associated with firm capacity.	Consider seeking alternatives to SFV because they are carrying the burden of fixed costs.
Competitive Environment	Many have fixed contracts with electric utilities. As electric utilities restructure some will be non-competitive.	Support competitive environment. Would provide competition to electric utilities own generating units and qualifying IPPs.	Environment is becoming increasingly competitive. Competition will hit the generation portion of the business initially. Increase the pressure to reduce fuel prices. Alternate fuels will affect gas and transportation prices.	Susceptible to bypass. Alternative fuels including electricity, propane, wood, solar. Larger customers may threaten to move. Supply competition moving toward small commercials and residentials.
Time Horizon	Long time horizon. Prefer long term fixed price supply and transportation contracts for financing reasons.	Prefer long term, but comfortable with shorter term than IPPs because not likely project financed.	Long time horizon which will shorten as competition intensifies.	Time horizon is becoming shorter. More comfortable with shorter-term (3 years & less) contracts for capacity & supply.

Table 3-3 (cont.)
Factors Affecting Customers' Purchasing Decisions

Factors	Municipal LDC	Niche LDC	Industrial/Large Commercial Fuel Switchable	Industrial/Large Commercial Not Fuel Switchable
Regulatory Environment	Traditional LDC regulatory environment. Uncomfortable with industry restructuring. Rely on security of tariffs.	Operate in traditional LDC regulatory environment but not necessarily embrace it or familiar with it.	Initial proponent of unbundling supply & transportation.	Proponent of unbundling supply & transportation.
Price	Price conscience. But not profit motivated.	Price conscience and profit motivated. Mostly concerned with cost of alternative heating fuels such as electric and propane.	Very price sensitive. Profit motivated. Alternative fuels will impact purchasing decisions.	Very price sensitive. Profit motivated.
Service Requirements	Tend toward city-gate delivered prices, with least amount of hassle. Will pay extra for bundled service because lack resources to diligently manage capacity and supply options.	Tend toward city-gate delivered price, with least amount of hassle. Will pay extra for bundled service because lack resources to diligently manage capacity and supply options.	Depending on size, sophisticated purchaser. Capable of managing own supplies & capacity. Moderately willing to pay small premium for bundled service.	Depending on size, sophisticated purchaser. Capable of managing own supplies & capacity. Moderately willing to pay small premium for bundled service.
Pipeline Capacity	Need firm capacity for its residential & commercial customers. Can utilize interruptible capacity for larger industrial customers.	Need firm capacity for residential and small commercial heating loads.	Because alternate fuels could be used, probably willing to use interruptible service. Interruptions could only be for short durations.	Depending on fuel use, may be capable of utilizing interruptible capacity. Interruptions could only be for short durations.
Location	Very specific. Strong concept of service territory.	Location specific. Many have to transport across LDC system.	Each plant is location specific. However, may have multiple plants using multiple pipelines & LDCs.	Each plant is location specific. However, may have multiple plants using multiple pipelines & LDCs.
Capacity Release	Participation in capacity release markets limited by load characteristics.	Very limited capacity release opportunities because of type of market (small, heating load markets). Not in summer.	Might participate depending on price and availability of alternative fuel.	Likely to participate.
Capacity Futures	Because transportation requirements are very location specific, likely not a player in a capacity futures market.	Because transportation requirements are very location specific, likely not a player in a capacity futures market.	Capacity futures as hedging device may be attractive. Industrials with multiple plants might also participate.	Capacity futures as hedging device may be attractive. Industrials with multiple plants might also participate.
Straight Fixed Variable Rate Design	May consider alternatives to SFV because they are carrying the burden of fixed costs.	May support alternatives to SFV because they are carrying burden of fixed costs.	Most interruptible because of alternate fuel capability and would likely oppose any change from SFV.	Most firm because of lack of alternate fuel capability and would likely support alternatives to SFV.
Competitive Environment	Susceptible to bypass. Alternative fuels including electricity, propane, wood, solar. Larger customers may threaten to move. Niche LDCs compete at edges of service territory. Supply competition moving toward small commercials and residentials.	Competition is usually limited to other LDCs. Alternate fuels such as propane and electricity are greatest concern.	Operate in a competitive environment and energy is usually a significant cost. With multiple plants, may move production to lower cost areas.	Operate in a competitive environment and energy is usually a significant cost. Those with multiple plants can consider moving production to lower cost areas.
Time Horizon	Time horizon becoming shorter, but not as comfortable with time frames as short as larger LDCs.	Most comfortable with slightly longer time horizons because of financing requirements.	Comfortable with shorter time frame on pricing provisions for capacity but like long supply commitments.	Comfortable with shorter time frame on pricing provisions but like long supply commitment.

Table 3-3 (cont.)
Factors Affecting Customers' Purchasing Decisions

Factors	Multiple Small Commercial	Single Small Commercial	Residential Developers	Residential
Regulatory Environment	Becoming more comfortable with competitive nature of supplies.	Becoming more comfortable with competitive nature of supplies.	Have not yet participated in regulatory environment.	Have not yet participated in regulatory environment.
Price	Price sensitive. Profit motivated.	Price sensitive. Profit motivated.	Somewhat price sensitive. Would use as a selling point for houses. Supply security more important.	Somewhat price sensitive. Supply security more important.
Service Requirements	Heating load usually requiring firm supplies. Willing to pay premium for bundled service. Don't want to manage supplies and capacity.	Heating load usually requiring firm supplies. Willing to pay premium for bundled service. Don't want to manage supplies and capacity.	Heating load usually requiring firm supplies. Want bundled service. Don't want to manage supplies and capacity. Supply & capacity security most important concern.	Heating load usually requiring firm supplies. Want bundled service. Don't want to manage supplies and capacity. Supply & capacity security most important concern.
Pipeline Capacity	Heating load usually requiring firm capacity.	Heating load usually requiring firm capacity.	Heating load requiring firm capacity.	Heating load requiring firm capacity.
Location	Each facility is very location specific. May have many facilities on different LDC and different pipelines (e.g., Safeway)	Very location specific. Capable of using only one LDC.	Each development is very location specific. Capable of using only one LDC. However, each development may use different LDC.	Very location specific. Usually capable of using only one LDC.
Capacity Release	Because of nature of requirements would not likely participate.	Because of nature of requirements would not likely participate.	Because of nature of requirements would not likely participate.	Because of nature of requirements would not likely participate.
Capacity Futures	Although may have multiple locations, on multiple pipelines, nature of requirements probably limits participation.	Because transportation requirements are very location specific, likely not a player in a capacity futures market.	Because transportation requirements are very location specific, likely not a player in a capacity futures market.	Because transportation requirements are very location specific, likely not a player in a capacity futures market.
Straight Fixed Variable Rate Design	Most firm and would likely support alternatives to SFV.	Most firm and would likely support alternatives to SFV.	Firm requirements and would likely support alternatives to SFV.	Firm requirements and would likely support alternatives to SFV.
Competitive Environment	Transportation on pipeline may be competitive.	Transportation on pipeline may be competitive.	Transportation on pipeline may be competitive.	Transportation on pipeline may be competitive.
Time Horizon	With LDC as safety net, probably comfortable with short term supply & pricing.	With LDC as safety net, probably comfortable with short term supply & pricing.	With LDC as safety net, probably comfortable with short term supply & pricing.	With LDC as safety net, probably comfortable with short term supply & pricing.

CHAPTER 4
INDUSTRY RESPONSES

The interstate natural gas pipeline industry completed the shift to unbundled services in 1994, with the issuance of Order 636. Since that time, the overall size and composition of the transportation market have changed substantially. Furthermore, the industry continues on the trend toward separating more services that were previously not provided, or provided as part of a bundled transportation or sales service.

4.1 RECENT TRENDS

Pipelines have been reorganizing in response to industry restructuring:

- consolidations and the development of megapipeline systems
- transfer or sale of gathering services
- continued expansion into unregulated business areas where growth opportunities are significant.

LDCs and intrastate pipelines are also reforming their business organizations in reaction to the changing transportation market:

- A number of mergers have taken place on the intrastate level.
- Many companies have set up marketing affiliates and developed unregulated services.
- Some pipeline companies and LDCs have diversified into other energy services, rather than focusing exclusively on natural gas.

4.2 PIPELINE RESPONSES

Pipelines are forming strategic alliances to capitalize on opportunities that could not be realized by the individual companies. Such alliances provide additional flexibility and allow companies to offer more services to serve new customers. In addition, marketing partnerships allow pipelines to reach new markets.

Interstate pipelines have two strategic responses they can follow:

- The first is to focus on maximizing profitability using the current market and regulatory situation, which is likely to preserve an adequate rate of return in the near future.

- The second is to develop a set of network services responsive to market needs; this response carries more risk and may reduce profitability in the short term, but also has the potential to increase profitability in the long term relative to the first approach.

These two responses are not necessarily mutually exclusive. It might be possible, for example, to pursue different approaches in different regional markets. To pursue these approaches simultaneously in the same market, however, risks a high expenditure of resources and confusion of the company's mission and image in the marketplace.

4.2.1 Using the Current Regulatory Situation

A response that focuses on maximizing profitability in the current market views a pipeline as a collection of physical assets, providing transportations services much like a trucking company provides more customized point-to-point service than a rail supplier. These pipelines will:

- focus their resources on obtaining maximum rates on firm transportation as long as possible, while generally preserving current regulatory conditions

- turn the management of imbalances into a profit center.

Although this strategy will preserve a rate of return for the pipelines, these companies rely on market stability. Other pipelines (or entities in the gas transmission business who have developed successful innovations in service) are likely to capture market share, leaving the core service providers with a shrinking market base.

Again, to choose this approach relies on a careful assessment of the timing of new development service, which, by itself, requires a considerable market intelligence effort.

4.2.2 Develop a Network of Services

The development of network services leverages the pipeline's unique capability to link the regional end user to gas supply. In terms of bulk supply, this allows pipelines to offer services in:

- customer portfolio balancing
- operational information transfer (pipeline to producer/marketer, hub operator, end user)
- customized volatility management through load aggregation and line pack.

In terms of network services, pipelines will have to evaluate an array of services that will have widely varying value to the diverse entities under its service umbrella.

Depending on the core capabilities residing within each pipeline (the operating side, the marketing side, or the administrative side) and the makeup of its regional market, each of these services will have differing priorities. In addition, the pipeline may find that strategic alliances or joint ventures with complementary entities provide a better way to offer these services than to attempt to offer them through the pipeline alone

However, compared to selling capacity, many services may be of marginal profitability, but even as loss leaders they may become critical to customer retention and development.

- access rights
- balancing, storage, and parking
- no-notice transportation and storage.

To become a network, a pipeline must:

- spend an enormous amount of time understanding who its new unregulated customers are today and will be three years from now, finding out in detail what these shippers want, and offering different services that are based on endless repackaging and tailoring of its core competencies.

- gain insight into how the deregulation of the gas and electricity distribution industries will change its business life.

Interview Comments

The types of services mentioned most included:

- accurate and rapid information on, e.g., access points, market prices
- customized services
- tailored pricing
- regional or national integrated invoicing
- billing information that can be used as a management and competitive tool
- continuity of customer representative relationships
- balancing services that range from daily to annual
- the ability to transport from producer to burnertip using a minimum number of agents
- insurance services
- forward pricing for capacity, for varying time periods or times of year, as well as option pricing for these services
- trade financing to match variability in cash flows or lags in receipts and payments of shippers.

- develop new information gathering, billing, and capacity pricing systems
- create a web of alliances with its most creative shippers such as the emerging new unregulated retail gas merchants; multilocation industrial companies; the evolving, large, unregulated regional and national power generation companies; and the new electricity.

4.3 PIPELINE SERVICES

Regionally well-placed pipeline companies will have a core transmission business with an adequate rate of return. They will experience limited pipe-to-pipe competition, and a high priority will be placed on those activities that help them maintain their position, including:

- customer retention
- containing costs and increasing efficiency and pipeline rehabilitation will be a priority over new capital projects
- reducing competition by building customer loyalty — deal management concepts will be increasingly important
- emphasizing information technology — more flexible and timely transaction management information systems.

Several pipelines will build energy service companies and anchor businesses at either end of their pipeline by creating alliances upstream with producers and downstream with storage operators and end users. To secure pipeline profitability, they will also invest in end-use markets, such as:

- distributed electric power generation
- natural gas vehicles
- increased retail market penetration, i.e., traditional markets without current access to gas.

Such pipelines will also reflect the integration of multiple fuels and related risk management services.

Other companies will export their knowledge and technologies to other regions of the world where the gas infrastructure is not as well developed. In these companies, investments outside of the United States and Canada will be the priority.

4.4 REINTEGRATION

The continued competitive restructuring of natural gas business raises fundamental strategic questions about how services will be delivered to customers.

In other industries that have undergone similar regulatory transitions, leading companies have prospered by developing new "reintegration" strategies to provide enhanced customer value. For example, in the oil and telecommunications industries, the initial phase of market-driven disintegration and commodity competition was followed by a period of reintegration, in which nonprice service attributes became increasingly important sources of competitive advantage.

Interview Comments

Some of the technical and operations knowledge that will be valuable in a world market include:

- deep water pipeline engineering, construction, and operation
- operation of high pressure mainlines through densely populated areas
- refurbishing existing systems and increasing efficiency of system operations.

Providers of natural gas services will have to develop new techniques for "mass customization" of service packages, incorporating features such as innovative pricing, delivery, billing, and financial risk management. This will require giving the customers what they need — not a plethora of choices.

4.4.1 Technological Integration

Technological integration will be a central task for companies providing new reintegrated packages of gas and energy services. As the transmission and distribution system is permeated with real-time price information, the optimal technical solutions for the customer will become increasingly site-specific and time-dependent. In response to these challenges, a new class of "super marketers" may emerge, with the capability to leverage technical skills across large geographic and sectorial market segments.

Interview Comments

Although some pipeline owners believe that "commoditization" of natural gas will diminish their role in providing customer services, others are committed to developing new ways of delivering highly integrated service packages in a more competitive environment.

4.5 CONCLUSIONS

- Transmission capacity is being rapidly transformed into a traded commodity.
- Regulatory changes are needed to increase the liquidity and trading effectiveness of the capacity market.
- The increased uncertainty and risk in the pipeline industry will likely drive up the cost of capital.
- The pipeline business will look more and more like other capital intensive businesses that experience volatile price changes for their products.
- Pipeline success will hinge on complementing firm transportation with the diverse flexible and cost-reducing service alternatives requested by customers.
- Full-service pipelines will have to gain access to a complete set of competencies through a combination of internal development and/or strategic alliances that establish market presence from the wellhead to the burnertip.
- Others may wish to remain niche-market rate-of-return players in the pure transportation market.