

UNBUNDLING OF SMALL-CUSTOMER GAS SERVICES: NEW CHALLENGES FOR STATE PUBLIC UTILITY COMMISSIONS

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I. INTRODUCTION

The evolution of competition in the U.S. natural gas industry has followed a predictable course. Wellhead deregulation stimulated pipeline restructuring, which in turn has provoked a debate over gas-service restructuring at the retail level. Over the last several years, almost all local gas distribution companies (LDCs) in the U.S. have established stand-alone transportation service allowing industrial customers to purchase gas supplies in the open market. By all accounts, service unbundling to large retail customers has achieved significant cost savings to these customers.

The current focus in the retail gas sector is on small customers — namely, small commercial and residential customers. Increasingly, state public utility commissions (PUCs) are considering service unbundling to small customers. Although much of this activity is concentrated on commercial customers, a full-blown debate over service unbundling to residential customers will soon ensue.

To many observers, service unbundling to small customers, especially residential customers, is not as clear cut in terms of yielding economic benefits as it was for large customers.¹ For example, they question whether residential customers or their agents can procure gas supplies and interstate pipeline services at a lower cost than an LDC. They also argue that the transaction cost for small customers, in terms of per-unit of gas purchased, may be much greater than for large customers. Finally, they believe the high cost of unreliable service to small customers may preclude reliance on market forces and contracts, to assure these customers the high level of reliable service that they demand.

Taking everything into account, it cannot be said with certainty that service unbundling would benefit small customers. Although conveying a message of caution to state commissions, this message should in no way

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1. See Stephen L. Huntoon, "Restructuring LDCs for the Competitive Environment," presented at the 27th Annual Conference of the Institute of Public Utilities at Michigan State University, Williamsburg, Virginia, December 11, 1995; Stephen L. Huntoon, *636 to the Burnertip?* PUB. UTIL. FORT. (July 1, 1994): 22-25; and Stephen L. Huntoon, *Barbarians at the City Gate*, PUB. UTIL. FORT. (September 15, 1995): 54-57.

imply that service unbundling to small customers is a bad idea. Comprehensive service unbundling with the correct regulatory rules in place should further enhance competition in the natural gas industry. If past trends in the natural gas industry continue, service unbundling will ultimately be available to all retail customers.

This article examines the many regulatory-policy questions relating to the unbundling of services to small retail gas customers. It argues that widespread service unbundling is an inherent feature of a competitive natural gas industry and will likely benefit gas customers and society at large. We caution, however, that for these benefits to be realized, state PUCs must reshape their current rules and practices to accommodate the competition that service unbundling will engender.

II. SURVEY OF UNBUNDLING ACTIVITIES

The expansion of service unbundling to more customers is now evolving. Several gas utilities began pilot programs for small customers starting in the fall of 1996.² An increasing number of state commissions have begun to recognize that broad-based unbundling warrants serious consideration. In some provinces of Canada, residential unbundling has been in place for ten years. Several provincial energy boards are enacting new rulemakings which (a) further level the playing field for the merchants, and (b) permit the distributor as a merchant to provide various gas services.

Several state commissions are beginning to ask the question: *Why should only large customers have the right to choose among different gas suppliers?* If the fruits of competition are to be enjoyed by all gas consumers, they reason, those customers in addition to large commercial and industrial ones should have the same opportunity to play the market. Of course, this requires the unbundling of different gas services.

Table 1 shows activities in several states, as of November 1996, regarding residential and other small-customer unbundling.³ Two jurisdictions, California and Ontario, Canada, have had the longest-running programs. California was a leader in allowing small customers, including residential customers, to purchase gas from sellers other than the LDC. The original February 1991 California decision by the PUC approved of an experimental program. Since then, the Core Aggregation Transportation (CAT) program has become a permanent fixture. The California PUC has modified the program to protect non-participating customers and to minimize stranded costs. In a July 1995 order, the California PUC gave small customers yet more opportunities to benefit from service unbundling.⁴

2. Until now, a common pattern has been for a state to initially consider residential service unbundling as a pilot or experimental program. See, for example, California, Illinois, Iowa, Maryland, Massachusetts, Ohio, Pennsylvania, and Wisconsin.

3. "Small customers" refer to residential and small commercial customers.

4. See Miriam Swydan, *Significant State Commission Actions Regarding Unbundling and Deregulation of Local Distribution Company Services*, Gas Energy Review 3 (December 1995); and REED CONSULTING GROUP, *Highlights and Summaries of Core Aggregation Pilot Programs and Services Offered by LDCs in North America and Great Britain*, 4-6 (Lexington, MA: Reed Consulting

The California PUC will soon allow customers to choose among different pipelines. This starts in 1998 for Pacific Gas and Electric and in 1999 for Southern California Gas and San Diego Gas and Electric. These customers or their agents (for example, marketers) will have the opportunity to purchase interstate pipeline capacity in competitive markets. The California PUC estimated that small customers were paying, on average, about seventy percent more than large or non-core customers for interstate pipeline capacity because of their inability to take advantage of competitive opportunities in interstate transportation markets.⁵ The PUC rejected unbundled rates for core services such as meter reading, billing, and collections.

TABLE 1
SMALL-CUSTOMER SERVICE UNBUNDLING ACTIVITIES
BY JURISDICTION

Jurisdiction	Status
California	Adoption of Permanent Core Aggregation Transportation (CAT) program
Connecticut	Requirement of firm transport service to commercial customers (Docket No. 94-11-12)
Georgia	Proposal by AGL Resources to the state legislature for residential service unbundling
Illinois	Residential pilot program by Central Illinois Light starting in fall 1996
Indiana	Proposal by Northern Indiana Public Service for residential experimental program starting in 1997
Iowa	Rock Valley experiment
Maryland	Residential pilot programs starting in fall 1996 (Washington Gas, Columbia Gas) and fall 1997 (Baltimore Gas and Electric); small-commercial customer unbundling since 1995
Massachusetts	Bay State Gas residential pilot program starting in fall of 1996; proposed residential pilot program by Boston Gas to start in fall 1997
Michigan	Gas utilities allowed to file small-customer pilot programs starting in spring 1997
Minnesota	Proposed small-customer program (excludes residential customers) (Docket No. G-008/M-95-216) by Minnegasco
New Hampshire	Transportation for customers (individual or aggregated) who consume more than 10,000 therms for any one month
New Jersey	Proposed residential pilot program by New Jersey Natural Gas and Public Service Electric and Gas Requirement of firm transport service to commercial customers
New York	Requirement of core (commercial and residential) aggregation programs; filing of programs by individual gas utilities

Group, February 1996). A major part of the California PUC decision is the requirement that the large LDCs in the state unbundle their interstate transportation service and tariffs from the CAT service.

5. Conversation with California PUC staff in January 1996.

Ohio	Pilot program for residential and commercial customers by Columbia Gas starting in April 1997 Proposed experimental transportation service for residential customers (Cincinnati Gas and Electric) Experimental transportation service for small customers (East Ohio Gas) proposed for 1997
Pennsylvania	Residential pilot program by Columbia Gas and for borough of Pleasant Hills Formation of Global Issues Committee to study issues relating to small-customer unbundling
Rhode Island	Proposed commercial program by Providence Gas to start in March 1997
Washington	Notice of Inquiry investigation of procompetitive policies (Docket No. UG-940778)
Wisconsin	Residential pilot program by Wisconsin Gas starting in fall 1996
Wyoming	White Paper recommended opportunities for load aggregation of all customers Adoption of KN Energy's "Choice Gas Service" program
Alberta, British Columbia, Manitoba, Ontario, Quebec, Saskatchewan	Direct gas sales to core (commercial and residential) customers

Source: Various sources, 1995-1996.

Since 1987, the Ontario Energy Board (OEB) has allowed direct gas purchases by residential customers. The OEB determined that increasing competition in the retail gas market requires open access and unbundled services. Ontario's direct purchase market for residential customers was essentially free to operate without oversight from government regulators. Aggregators/brokers/merchants (ABMs) could use buy/sell or any other alternative in arranging transmission capacity.⁶ Significant savings were initially gained because spot wellhead prices were low compared to the price of the utility's portfolio of long-term, fixed-price supply; also, some ABMs made use of lower cost, short-term contracts for transmission capacity and storage. This lower cost lasted until 1993 when spot-wellhead prices rose above the utility's weighted average cost of gas (WACOG). As a consequence, some ABMs withdrew and shifted their customers back to the utility for service.⁷ The OEB held hearings and then issued a Code of Conduct for all merchants proposed by the Ontario Natural Gas Association, and a Code of Ethics drawn up by the Direct Purchase Industry Committee

6. A buy/sell arrangement is a means of procuring gas supply whereby ownership of the gas is transferred from the seller to the LDC for delivery to end users. The LDC normally bills the buy/sell customer at its tariffed rate for system gas. The seller rebates to the customer the difference in price between the gas distributor's weighted average cost of gas (WACOG) and the gas purchased on behalf of the customer, after subtracting for an agent fee.

7. Paul Woods of Ontario-Wide stated at a recent OEB hearing that less than one-half of one percent of all customers left their direct purchase service through this period of high spot-wellhead gas prices. Robert Callow of Municipal Gas Corporation claimed that no customer has been denied service or been financially disadvantaged by taking direct purchase service in Ontario. Yet, others argue that a large number of customers were shifted back to the utility's merchant service and that the utility's WACOG was forced up because of incremental purchases to serve these customers.

(DPIC). The OEB is currently in the midst of a new inquiry that could result in the mandated separation of the utility's merchant function from its distribution function. The utilities have focused on the benefits of offering different supply portfolios for which the OEB would show lighter price-regulatory oversight while allowing them to remain both merchant and distributor.⁸

III. THE ECONOMIC RATIONALE FOR BUNDLED SERVICE IN THE NATURAL GAS INDUSTRY

Prior to the mid-1980s, most LDCs did not offer unbundled services.⁹ They were constrained from doing so by the fact that pipelines were not common carriers. Therefore, retail customers were unable to directly purchase gas supplies and other gas services in the marketplace.¹⁰ With little hesitation, we can say that mandated bundled service imposed a cost on both gas consumers and society at large. What also seems quite certain is that LDCs, from a self-interest perspective, had good reasons to offer only bundled service.

Bundling of services and products is a common phenomenon throughout economic systems. In the economics literature, bundling is regarded as a marketing strategy that largely arises for the following reasons: (1) cost economies; (2) technological interdependency; and (3) demand interdependency.¹¹

Cost economies, or what is commonly called "economies of scope," refer to cost savings attributable to one firm producing and selling different services together as a package. For example, an LDC may be able to provide retail gas service at a lower cost to consumers when it combines gas supplies, transportation, and storage into bundled sales service. By coordinating these services on its gas system, an LDC can realize cost savings that would not otherwise accrue.

8. The OEB's recent hearings carried the official headings "Where We Are" and "Where Should We Be Going." The hearings were a review of a decade of experience and an examination of the current market structure.

9. In the mid-1980s, local gas distributors commenced the offering of a bundled product; local companies manufactured natural gas, which was sold primarily for private and municipal lighting; regulatory concern focused on the protection of exclusive franchise areas. With the emergence of gas fields, long distance transportation, and more uses for gas, state regulation, influenced by the Granger movement, focused on gaining power over the rates and services of essentially private monopolistic enterprises. Regulation developed from wellhead to burnertip along with long-term contracts among producers to pipelines and pipelines to distributors; all were designed to provide the small consumers of natural gas with low rates absent any monopolistic profits. The issue of whether there were cost economies of the distributor being the sole merchant was assumed, never subject to analytical assessment.

10. The attractiveness of unbundled service was also hindered by the reality that all gas purchases to the city gate were regulated and transaction costs for individual choices were high, partly because of the lack of information technology.

11. See, for example, Roger Blair and David L. Kaserman, *ANTITRUST ECONOMICS*, ch. 15 (1985); and Dennis W. Carlton and Jeffrey M. Perloff, *MODERN INDUSTRIAL ORGANIZATION*, 841-43 (2d ed. 1994).

Empirical evidence of economies of scope at the distribution level is scant.¹² To the contrary, when transportation programs became available to industrial customers, most eligible customers opted for unbundled service. This suggests (although does not prove) that any lost economies that may have accrued were more than offset by cost reductions from competitive pressures. An LDC's bundled sales service could not successfully compete with unbundled services that became available. Simply, bundled sales service failed the market test; notwithstanding any economies of scope that may have existed, consumers found it beneficial to purchase gas-service components on an unbundled basis.¹³

A firm may also wish to offer only bundled services or products because of technological interdependency.¹⁴ In the case of natural gas, highly reliable retail gas service is crucial. Reliability depends upon the availability of upstream pipeline capacity, storage, gas supplies, and distribution. The value that retail gas consumers place on an LDC's overall service is, therefore, assembled from the value of individual components. LDCs may have felt that supplying those service components directly to retail consumers in the form of bundled service would best assure highly reliable and safe service.¹⁵ Unreliable or unsafe service could jeopardize both the goodwill and reputation of an LDC in the eyes of its consumers and regulators.

Experiences in service unbundling at the pipeline and retail levels so far have attested to the invalidity of this argument. Customers or their agents have the incentive and capability to contract for individual services with high reliability. Presumably, there is nothing inherently difficult about contracting for highly reliable gas services that only an LDC could perform. In other words, no reason exists for the LDC to be the most efficient and the only reliable intermediary of gas services. The more pertinent question is whether the transaction costs of purchasing and combining unbundled services exceed or fall short of the savings achieved by customers when allowed to purchase their own services in the marketplace. As mentioned above, gas consumers and their agents have benefited from purchasing and combining individual gas services.

12. Some evidence of economies of scope for LDCs is presented in Mary Lashley Barcella, *Natural Gas Distribution Costs and Efficiency: Implications for Regulation*, 15. (February 1993). But the author cautions that:

[T]he design of the study does not allow a clear test as to whether the source of natural monopoly [economies of scale and economies of scope] is in the gas distribution activities of LDCs, the gas purchase/sales activities, or a combination of the two. To the extent that economies of scale and scope are present in one function and not the other, it may be possible to unbundle gas distribution from gas purchase/sales without adverse effects.

13. It may be argued that unbundling could actually increase economies of scope and economies of scale by allowing large merchants, such as Enron, Tenneco, and AMOCO, to replace smaller LDCs in the provision of gas supplies and upstream pipeline services.

14. See, Blair and Kaserman, *supra* note 11, at 382-83.

15. Marion B. Stewart, Vice President of the National Economic Research Associates, offered this idea to one of the authors.

Firms also bundle services and products as a tool of price discrimination.¹⁶ By forcing the tying of complementary services, for example gas supplies and gas transportation, a firm has the ability to separate customers into groups with different demand characteristics. Economic theory shows that bundling allows a firm to extract more consumer surplus than it would under unbundling or uniform monopoly pricing.¹⁷ Most of these instances require that the demand for the individual services or products are interrelated. For example, assume that a firm rents carpet cleaners and requires the purchase of cleaning fluid. By selling the cleaning fluid above the competitive price, the firm, in effect, earns a higher rent on the carpet cleaner.¹⁸ Putting it another way, the firm would receive revenues on the carpet cleaner equal to the rental rate, plus the economic profit earned from selling the cleaning fluid. Consumers who use more cleaning fluid would in effect pay a higher rent for the carpet cleaner. Consistent with price discrimination, those who more intensively operate the carpet cleaner (thereby placing more value on the carpet cleaner) would pay a higher price.

In examining the incentives of LDCs to offer only bundled sales service, the influence of regulation cannot be ignored. State regulation limits the profits of LDCs largely by guarding against excessive price discrimination and overcharging of inputs (for example, gas supplies). This implies that an LDC could not recover excessive revenues from gas supplies to discriminate against higher gas-usage consumers.¹⁹ In theory, if regulation works as planned, an LDC could not use service unbundling as a form of price discrimination. In practice, however, largely because of information asymmetry, LDCs may be able to mark up the price of gas supplies.²⁰ Especially when an LDC purchases gas supplies from an affiliate, a regulator may find it difficult to prevent excessive payments by an LDC.²¹ This

16. Most economists would argue that price discrimination, rather than monopoly leveraging, is the more logical reason why most firms bundle their products or services. Accepting this argument, one cannot say deductively that all bundling is necessarily socially undesirable. In fact, some bundling motivated by price discrimination has undoubtedly increased economic welfare. See William James Adams and Janet L. Yellen, "Commodity Bundling and the Burden of Monopoly," *Quarterly Journal of Economics* 90 (1976).

17. See Carlton and Perloff, *supra* note 11, at 470-79.

18. This example follows the antitrust case where IBM was accused by the federal government of anticompetitive practices by requiring purchasers or renters of its tabulators to buy all of their tabulating cards from IBM. See *IBM v. United States*, 298 U.S. 131 (1936).

19. Assume, for example, that an LDC has the ability to price gas supplies above cost, or to earn above-normal profits for the parent company from an affiliate transaction. The return on distribution service earned from individual customers would then depend upon those customers' actual gas usage. Take, for example, two customers who pay the same demand charge, but one customer consumes more gas than the other. If the LDC prices gas supplies above cost, the higher-usage customer would in effect be contributing more toward distribution costs. This would be true even though "on the books" she would be paying the same amount for distribution as the other customer.

20. Information asymmetry refers to the fact that LDCs hold an advantage over their regulators in knowing whether or not they paid excessively for gas supplies.

21. The problem of affiliated transactions for regulators is examined in Mohammad Harunuzzaman and Kenneth W. Costello, *State Commission Regulation of Self-Dealing Power Transactions* (1996).

possibility was more likely in the past when a spot and futures market for gas did not exist. In that environment, it was difficult for a regulator to identify an appropriate reference price for evaluating individual gas purchases. Assuming that an LDC could mark up the price of affiliated gas supplies, it could then exploit service bundling as a price discrimination tool. The likelihood of this outcome is greatly enhanced when third-party gas suppliers are hampered in selling gas supplies directly to the retail market. Otherwise, the LDC would have an incentive to purchase the lowest-cost gas supplies or to make those sources of gas supplies available to retail consumers.

IV. GENERAL OVERVIEW OF SERVICE UNBUNDLING

Several points can be made here about the general effects of unbundling and the packaging of unbundled services. First, unbundling *per se* gives consumers more market choices. Consumers can always add up the prices of individual components and compare them with the price of a bundled service or any combination of bundled and unbundled services. Consumers would tend to select the alternative with the lowest aggregate price, assuming quality and other product attributes are the same. Unbundling should rarely harm consumers and almost always benefit them.²² If consumers could make the same choice as before, but now have additional choices, it is logical to conclude that they should be better off.²³

Second, wholesale service unbundling alone may fall short of maximizing benefits to retail customers. In the case of the natural gas industry, FERC Order 636 and previous FERC orders led to the unbundling of pipeline services. Currently, a major issue surrounding restructuring of energy (electricity and natural gas) utilities is: *To what extent do wholesale competition and wholesale service unbundling fall short, if at all, of maximizing benefits to retail consumers?* If one believes that additional benefits from retail service unbundling are small, then from an economic perspective it can be argued that it is unnecessary. An analogous debate existed in California between the "Poolco" advocates and the "Direct Access" advocates.²⁴

On the other hand, in line with experiences across different industries and with economic theory, retail service unbundling seems to be a prerequisite for a fully-competitive natural gas industry. The basic economic argument is that only retail consumers themselves, or their designated

22. Conceivably, the forced purchase of unbundled services could cause an industry's costs to rise because of lost scope economies, thereby increasing prices to consumers. As discussed elsewhere in this article, requiring small customers such as residential households to purchase all of their gas services on an unbundled basis would be ill-advised. Other potential adverse effects of unbundling of public utility services originate mainly from regulatory practices. For example, the fact that unbundling may cause cost shifting, with the consequence of higher prices for some customers, is essentially an equity issue arising largely because of cost-of-service regulation.

23. Of course, *ex post*, consumers could be worse off when they make a choice that turned out to be wrong.

24. See, for example, Matthew C. Hoffman, *The Future of Electricity Provision*, 3 REGULATION 17, 55-62 (1994).

agents, can decide what is in their best interests. The wholesaler, or the LDC in the case of natural gas, just does not have a strong incentive or the ability to maximize the well-being of its customers. The principle, that what is good for firms is good for consumers, only holds under competitive conditions. So to argue that retail competition induced by service unbundling is not a necessary condition for maximizing consumer interests generally conflicts with market realities. To confirm this, just ask the rhetorical question: *Would the products and services we buy today be as cheap or as differentiated if retail outlets had exclusive rights to sell in a specific geographical area?*

Third, forcing a firm to unbundle all of its subservices may actually harm consumers. This could particularly hold true for small customers. These customers, for example, would tend to have higher transaction costs (say) per unit of gas services consumed. Therefore, requiring them to search out and negotiate with providers of different gas services may impose a high cost upon them. Of course, market facilitators, (for example aggregators, brokers and others), would try to lower those transaction costs. In any event, offering both bundled and unbundled service, at least during the start-up period, for small customers, would seem preferable to mandatory service unbundling. The major reasons for this are that some small customers may not want unbundled service because of high transaction costs or the perception that such service would be less than highly reliable.

Fourth, and not surprisingly, from an economic perspective, the optimum degree of unbundling has a limit. For example, technically one could purchase different parts of a car from the different vendors and have someone assemble the car. In effect, the person would be purchasing unbundled products and combining them to make a product from which the consumer directly benefits. Instead, for most products and services, consumers prefer to buy the "finished product" rather than a "kit." Time considerations, the cost associated with assembly, and other factors contribute to consumers frequently preferring the finished (bundled) product.

In the case of retail gas markets, two questions relating to the optimal degree of unbundling are particularly relevant: (1) For which customers would service unbundling be economical? and (2) How far should service unbundling behind the city-gate extend? Regarding the first question, service unbundling may be unattractive to some customers, especially small customers. But, as discussed above, so long as these customers have the right to choose between unbundled and bundled sales services, they are no worse off. Because some customers choosing unbundled service would be better off, overall net benefits should be positive.

With respect to the degree of unbundled behind-the-city-gate services, the concept of economies of scope comes into play. As discussed previously, economies of scope refer to the cost savings from the LDC, rather than different entities, providing a set of gas services demanded by consumers. This means, for example, that costs can be reduced when the LDC uses its physical assets to jointly provide distribution, on-system storage,

peaking, and balancing services. Economies of scope encompass what is sometimes called "economies of vertical integration" or "economies of coordination." One major factor of economies of scope is knowledge. Knowledge of one activity may promote the efficient production of others. Another factor is the complementary relationship between a firm's physical assets. For example, gas distribution and on-system storage may be less costly when provided together. A necessary condition for economies of scope is deployment of common inputs in the provision of two or more services. Economies of scope, however, do not necessarily imply that one entity should provide the different services. Separate entities operating under a contract could well achieve the same economies of scope as a single entity could. In other words, coordination of services using the same physical assets could be accomplished in the absence of single ownership.

Fifth, service unbundling could diminish certain economic problems associated with a regulated public utility. The major problems include productive and pricing inefficiencies. Service unbundling would place pressure on the LDC to eliminate any cross-subsidies that may currently exist and, in general, to price individual services on the basis of actual market conditions or economic costs. By allowing entry, service unbundling also places competitive pressures on the LDC to operate and plan more efficiently, or else risk losing sales and profits to more efficient service providers.

Table 2 lists the potential benefits from the unbundling of residential gas services. These benefits include the following:

- *Consumer preferences are better met.* Different customers have varying preferences for price and supply risks, quality of service, the freedom to choose, and so forth; producers' preferences also differ among themselves. When the distributor provides only one basic supply service, the terms and conditions underlying the distributor's portfolio may differ from what many consumers most prefer and also may leave many producers without the terms by which they gain greater value. Only free and total interchange of gas services will provide each party the ability to achieve maximum welfare. This simply cannot be met by the LDC's contracting decisions that are approved by the state regulator.

TABLE 2
BENEFITS ASSOCIATED WITH
RESIDENTIAL SERVICE UNBUNDLING

- Better price signals
- Lower regulatory costs
- Better principal-agent dealings
- Improved regulation
- Services better matched to consumer preferences
- Gains to all gas consumers from more competitive natural gas industry
- Better utilization of natural gas
- More efficient industry investments
- *Unbundled residential access resolves the contract portfolio issue.* Regulatory rules can interfere with gas producers and consumers gaining the

contract duration or price stability that they seek. Access gives each producer a larger number of parties with which to contract and, hence, the ability to negotiate the terms most preferred. Likewise, access gives each consumer a larger number of producers with which to contract and, hence, the ability to negotiate more favorable terms. Access removes any bias that LDCs or regulators can exert that would cause contracts to differ from that determined by market forces.

- *Unbundled residential access resolves any principal-agent divergence.* The regulated firm may face regulatory guidelines that contain few rewards for superior behavior but contain penalties for inferior performance. In this situation, the gas distributor may seek to minimize its exposure to risk rather than aggressively searching for the "best cost" service. For example, some state regulators have limited a distributor's incentive to use financial market derivatives by allocating gains to customers and allocating losses to shareholders. State regulatory agencies are not well equipped to judge sophisticated purchasing strategies; only market pressures can accomplish this satisfactorily.
- *The scope of state regulatory oversight is diminished.*²⁵ The state regulator would no longer need to judge the terms and conditions for the purchase or sale of (1) gas commodity, (2) transmission capacity, (3) storage, or (4) supplemental peaking supplies. It would also no longer be necessary to include those factors in the LDC's regulated rates. The market is too dynamic and is not well-suited for improved traditional or performance-based regulation. Thus, not only are regulatory costs reduced, but market-determined decisions result in more accurate price signals to consumers, distributors, and producers.
- *Cost shifting among customer classes is minimized.* When unbundled residential access is denied to some customers, it is possible to bifurcate the market. This may permit costs to be unduly shifted to one or more customer groups. Wellhead to burnertip access would diminish this ability to shift costs and, hence, would lessen inequality among customer classes.
- *Dynamic forces for improving regulation are created.* Unbundled residential access also affects the specific changes sought in the regulatory-legislative arena. At the federal level, the distributor's role becomes augmented by unregulated marketers. These marketers' profits are tied directly to serving customers best. As these marketers become more dominant, their presence will tend to alter the regulatory environment toward workably competitive markets.

Sixth, over the short term, service unbundling *per se* may not necessarily improve economic performance in the natural gas industry. Unbundling in one sense places more pressures on the industry to be efficient: the

25. At the federal level, nondiscriminatory access has enabled the FERC to end its oversight of prices paid for wellhead gas supplies and, in certain circumstances, its oversight over the price and conditions for storage services. At the state level even more substantial lessening of the regulatory oversight is feasible. Areas for the termination of state PUC oversight include gas costs via the purchased gas adjustment clause (PGA), costs of pipeline contracting, and local peaking supplies.

increased competition induced by unbundling requires service providers to focus more on economic-efficiency objectives and less on others. Over the short term, however, especially in an environment with long-standing "old" regulatory rules and transition problems, economic performance can actually worsen. Inefficient pricing of unbundled services, risk-allocation distortions,²⁶ high transaction costs, initial mistakes by consumers, transitory monopoly behavior, and outdated regulatory rules in general, can all contribute to declining economic performance.

These problems should diminish over time because of economic and political pressures. As in many real world situations, when regulatory and industry practices act contrary to market realities, change becomes inevitable. Interest groups and regulators themselves would find it beneficial to reassess current practices and search for new ones that are more in line with actual market conditions. Failure to act accordingly would sustain the new inefficiencies, translating into less wealth for certain interest groups and society at large.

The main point conveyed here is that for service unbundling to be economical it must function in a market and regulatory environment where efficiency and consumer responsiveness determine the success of different service providers. Outcomes induced by regulatory and market malfunctions violate this condition. These malfunctions may include entry barriers, rigid regulatory-pricing and obligation-to-serve rules, and discriminatory access to natural-monopoly facilities. Any of these could induce inefficient performance of the natural gas industry.

As a fundamental question, one may ask: *What benefits accrue to retail consumers when they purchase rebundled or "package" services (i.e., two or more unbundled services) from the LDC rather than the old bundled sales service?*²⁷ Would consumers not be essentially receiving the same gas service and, just as before, be paying one price?

Although the answer is "yes" to each of these questions, rebundling would be expected to benefit consumers. The simple reason is that consumers would have more choices under rebundling. In that world, consumers could choose among *different combinations* of gas services offered by available gas service providers. Because of these opportunities for consumers, competitive pressures should constrain the "total price" below what it would be in the old bundled-sales-service world. Throughout the economy, "package" services are often sold at a discount relative to individual components.²⁸ One could pose the following "thought experiment:" *How*

26. Risk-allocation distortions would result, for example, if the LDC continues to be the "supplier of last resort" without being adequately compensated. Any market risk that becomes external to the decisionmaker represents a risk-allocation distortion.

27. Rebundled service is a form of unbundling where one entity, such as an LDC, sells two or more unbundled services in a package.

28. As an example, if consumers had to purchase each component of an automobile, the total cost would be substantially higher than the cost of a packaged or finished automobile that virtually all consumers buy.

would the prices of the products and services we buy today change if unbundling was prohibited?

For example, assume that we are required to buy all of our personal computer needs from a single retailer who has exclusive territorial rights. Also assume that the retailer was unwilling to sell separate hardware and software components. In other words, a consumer would have to purchase a bundle of personal computer products to satisfy her needs. It is safe to say that, compared to today, consumers would pay more for personal computer services. When individual components can be sold by themselves or in a package with other components, the ability of the retailer to price discriminate or to set an excessive price lessens. By revealing the prices of individual components, unbundling imposes a tighter limit on the price charged for bundled or rebundled service. In effect, by giving consumers more market choices, unbundling diminishes the degree of price discrimination (though it does not eliminate it). For many products, the rebundled service sells for less than the sum of its components. It can be said that this discount reflects a form of discriminatory pricing that is good for consumers and society at large.

V. INDIVIDUAL REGULATORY-POLICY ISSUES

Residential service unbundling will accelerate and broaden competition in the retail gas sector. As such, it requires regulators and LDCs to revisit prevailing practices and policies that were largely designed for a highly monopolistic environment. Residential service unbundling without accompanying changes in the scope and the fundamental tenets of regulation could create problems that would diminish the benefits. Regulatory reforms in pricing rules, obligation-to-serve requirements, planning guidelines, social-activities requirements, and corporate structure will be necessary if maximum benefits from residential service unbundling are to be realized.

Some policymakers may believe that unbundling can be initiated with only minor changes in current regulatory rules. According to this position, trying to "wait until all the pieces are in place" or to "fine-tune" change could excessively delay beneficial actions. Policymakers could always embark on the new activity and deal with specific problems as they arise.²⁹ It is highly likely that if residential service unbundling precedes necessary regulatory reforms, economic pressure would inevitably develop for such reforms. In their absence, the market would perform inefficiently and some interest groups would quickly demand regulatory changes. These changes would be geared toward accommodating competitive forces and enhancing the economic well-being of those interest groups. What this all says is that regulatory reforms would arrive sooner or later.

29. An emerging development in some states is to institute pilot or experimental programs designed to accumulate information on consumer acceptance and benefits to residential customers. Pilot programs can help to demonstrate the feasibility of unbundling, identify major problem areas, and educate consumers about the benefits and costs of unbundling.

This section examines several regulatory-policy issues associated with service unbundling, particularly with reference to residential customers. For the majority of them, no easy resolution exists. They will be debated at the state level, in some instances with interest groups taking highly divergent positions. A detailed discussion of the major issues follows.

A. Pricing Rules

The appropriate pricing rule for an unbundled service hinges on the actual market environment. Services with natural-monopoly features will continue to require some form of regulatory price control. Distribution delivery comes to mind as one LDC service, and perhaps one of only a few, that falls within this category. Regulatory pricing options for such monopoly services include performance-based regulation (PBR), fixed-variable or volumetric rate designs, embedded-cost prices, and bilateral-negotiated prices.³⁰ Time-of-use or real-time pricing would be economically justifiable under the condition that metering costs lie below the gross economic benefits from market-responsive pricing.³¹

For competitive services, where the LDC lacks the ability to set above-market prices for a sustained period, the LDC should be relieved of price regulation.³² The market can be relied upon to control prices.

Recently, certain PBR mechanisms have become increasingly popular. Their objective is to reward gas distributors either for minimizing the purchased gas costs or for maximizing resale of unused or underutilized city-gate gas supplies (commodity, pipeline, and storage capacity). From our perspective, PBR mechanisms for competitive services are inferior to the combination of unbundling the distributors' services and providing access to third-party merchants, as long as the transaction costs associated with customer choice are small.

The major task for the regulator is to align an unbundled service with the correct pricing rule. "Getting it right" is important for maximizing the economic performance of retail gas markets. Adhering to rigid pricing rules when markets are competitive can lead to uneconomic bypass and other sources of price-induced welfare losses.³³ On the other hand, flexible

30. PBR can be viewed as an alternative to unbundling or competitive markets. The authors take the position that PBR would be a poor substitute. Instead, PBR can be most valuable as a price-control mechanism for noncompetitive gas services, such as distribution.

31. Seasonal pricing, which requires no metering costs, is a less efficient variant of time-of-use pricing that should improve economic efficiency. *See, e.g.,* Ken Malloy, *The Holy Grail: Pursuing Complementary State/Federal Gas/Electric End-Use Policies to Optimize Gas*, 468-72, *Proceedings of the Third Annual DOE/NARUC Conference on Natural Gas Use* (Washington, D.C.: U.S. Department of Energy, 1995).

32. In a competitive market, prices would gravitate toward the marginal cost of the highest-cost provider of a service. Lower-cost providers are able to earn an economic profit.

33. Rigid pricing rules tend to be nonresponsive to the varying demand preferences of consumers. In other words, they fail to account for the value that consumers place on a particular service. In addition to creating a "triangular welfare loss" (from a price-marginal cost gap), rigid pricing can lead to uneconomic bypass (i.e., consumers buying from providers with the lowest prices, but not necessarily with the lowest economic costs).

pricing rules under monopolistic conditions may produce undue price discrimination and excessive prices to some customers.³⁴

B. LDC Planning and Operation

As mentioned repeatedly, service unbundling will cause LDCs to behave more like competitive firms. One consequence is that LDCs will place more emphasis on optimizing the utilization of their assets and on minimizing their capital costs.³⁵ For those LDCs that will no longer be in the gas merchant business, the primary focus will be on increasing throughput on their delivery system.³⁶ These LDCs will engage more in selected rate discounting and other strategic practices to maximize revenues from the provision of delivery services. Consistent with increasing throughput on their systems, LDCs will try to promote end-use demand for gas. Removed from the gas merchant business, these LDCs should be indifferent to the source of the gas that passes through their systems.³⁷

Another expected outcome of service unbundling is that the acceleration of competitive forces will limit the costs, whether capital or operating costs, incurred by LDCs to what consumers would be willing to pay for services. Under traditional ratemaking practices, a utility's actual or reported costs would determine prices. In contrast, in a competitive, service-unbundling environment, the utility would attempt first, to measure the value of individual services to customers, and second, to establish a cost ceiling for those services that would allow it to earn a minimum acceptable rate of return. In other words, under competitive conditions the value that consumers place on a product or service drives a firm's costs and prices.³⁸ In this circumstance, costs that consumers are unwilling to pay get absorbed by the firm.

Contrast this with a regulated world where the utility has monopoly status. Unless determined to be imprudent, the utility can normally pass its

34. When flexible pricing leads to lower revenues, relative to embedded-cost pricing under the assumption of constant usage, regulators must decide how these revenue losses should be allocated. Allocating them to price-inelastic consumers would drive up their prices. It would also require the regulator to more closely examine the merits of a lower price, since the risk of a revenue loss would fall on consumers. In cases where flexible pricing has resulted in revenue losses for electric utilities and LDCs, state regulators have allocated these losses to both shareholders and price-inelastic customers.

35. To many observers of the natural gas industry, an LDC's profitability in the future will largely depend on the ability to sustain high throughput and sales on its distribution system.

36. See Branko Terzic, *State Approaches to Natural Gas Re-Regulation*, presented at the 27th Annual Conference of the Institute of Public Utilities at Michigan State University, Williamsburg, Virginia, December 11, 1995.

37. Of course, if LDCs form marketing affiliates there is the danger that they would favor gas supplies from those entities. Two states, Wisconsin and New Jersey, have recently established guidelines for LDC marketing affiliates. See *Wisconsin Public Service Commission Adopts Rules for Conduct of LDCs and Affiliates and Will Address Other Capacity and Supply Management Issues*, Foster Report No. 2065, 19-22 (February 1, 1996); and *New Jersey BPU Adopts Guidelines for LDC Relations with Marketing Affiliates*, Foster Report No. 2062, 17-19 (January 4, 1996). The FERC has articulated its position on pipeline marketing affiliates in Order 497.

38. The management expert Peter Drucker refers to this outcome as "price-led costing." See Peter F. Drucker, *The Information Executives Truly Need*, 54 HARV. BUS. REV. 1995.

actual costs to consumers. Under traditional planning practices, the utility's objective is to minimize costs subject to meeting its peak-day load and a required reserve target.³⁹ In a more competitive environment the LDC would be under greater pressure to both control cost and incur costs only when they add value to services offered in the marketplace.

In sum, comprehensive retail-service unbundling would transform an LDC's planning and operation activities from a "top down" approach to a "bottom up" approach. Under the latter, the LDC would start with consumer information respecting the market value of individual services to guide planning and operation decisions and associated costs.

C. *New Costs*

There is considerable divergence of opinion on the costs to serve residential customers through unbundled services. Some observers of the industry perceive that high costs will limit the viability of this option. Still others note the absence of merchants clamoring for this option. On the other hand, the higher costs incurred to serve residential customers may provide greater opportunity and challenges for new merchants. Some state PUCs may believe that the market can provide this answer; yet, unless regulators take a proactive stand in creating a fair basis on which all service providers could effectively enter and compete, the market may malfunction.

Several comparisons may be at issue. Plainly, the third-party merchants may have higher costs in providing residential service than in providing industrial service. These higher costs in maintaining service for low load-factor customers, however, already exist for the distributor in providing this service. The question is whether a third-party merchant would have lower or higher costs than comparable service provided by the distributor. The following discussion identifies five cost components.

1. *Billing Costs*

The issue here is whether new costs associated with billing customers for their gas usage arise once residential customers use the distributor for only transmission from the city gate to the burnertip. Until now, many customers selecting unbundled transportation from the distributor have been required to pay additional charges for time-of-use meters and, in some instances, for a dedicated telephone line.⁴⁰ These additional billing charges have made unbundled service uneconomical to customers with smaller usage.

The elements embedded in billing costs include: (1) the type of meter required and its reading; (2) the cost of changing a customer's account from

39. For a discussion of LDC planning practices, see CHARLES GOLDMAN ET AL., *PRIMER ON GAS INTEGRATED RESOURCE PLANNING* (1993).

40. Often, these customers are large commercial and industrial end users. The charges have been defended as compensation for monitoring whether a customer's usage during capacity-constrained periods is diminished when the customer takes interruptible service or whether the customer's peak-day usage lies within the bounds of the nomination entitlement.

one merchant to another; (3) the cost of determining each customer's historical monthly gas requirements; and (4) the cost of aggregating these requirements by merchant to obtain each merchant's monthly required deliveries.⁴¹

The calculation of monthly nominations by a residential customer is more difficult than calling the energy manager of a large industrial firm who has analyzed the firm's energy usage in detail. Yet, once the residential customer's usage is calculated (distributors have models that make these projections), residential nominations have small variations. On the other hand, the industrial firm's demand hinges upon economic activity and specific industry, firm, and product characteristics that not even the industrial firm always predicts well.

The additional billing costs of a residential customer choosing unbundled service is quite small. The information on the customer's selection can be electronically transmitted by the new merchant to the distributor. The distributor must perform a one-time electronic check against the customer's past usage pattern and have a computer program that inserts the merchant's name and prices when printing the traditional monthly bill.⁴²

A merchant serving customers in a new residential subdivision, for example, would rely upon the same monthly projected gas usage that the distributor currently projects if it was providing the merchant service. There is no new cost in making this determination. Likewise, the distributor currently bills and reads the meter. In addition, other activities would not need to change under unbundling unless the state commission wishes to expand the range of unbundled services.

How incremental costs should be allocated hinges upon the judgment of which customer service came first. If residential customers are assumed to have choice, their prior bundled rates already incorporate a distribution fee, an access fee to a merchant, and a merchant fee. There are no new costs associated with shifting to another merchant. The access fee is still paid; all that changes is that the access fee links the customer to a different merchant. The costs associated with the merchant fee simply go to another merchant. The total billing costs do not change, only their allocation changes. This is quite similar to the access fee that became part of all telephone customers' monthly bills with the breakup of AT&T and customer choice of their long-distance carrier.

2. Monitoring Costs — Integrity of the Physical System

The distributor must ensure that each third-party merchant serving residential customers is in balance between nominations and deliveries on

41. The determination of whether existing residential customers who take service from a particular third-party merchant have a different load pattern than other residential customers and, hence, should be charged differently, should not be considered as a cost of unbundling or access. Plainly, differences in load patterns among these residential customers have been ignored in establishing prior rates.

42. Under this arrangement, the LDC would issue two bills and act as a collection agency for the merchant.

a daily and monthly basis, just as the distributor must ensure that its own merchant service is in balance. If costs associated with imbalances arise, then penalties must be assigned to encourage better planning and to provide sufficient compensation to make the distributor financially whole.

Staff time is absorbed in the gas supply operation to perform this monitoring. A charge for this must be levied, but this charge should not exceed what is currently being charged an industrial transportation customer.⁴³ Once spread over several or many thousands of smaller customers, the fee paid by each third-party merchant should be insignificant for the individual residential customer.⁴⁴ This monitoring should be easier than for an industrial or large commercial customer given that the distributor is comparing actual deliveries with computer projected residential usage, rather than actual meter readings and reporting. Penalties are easier to assign.

The monthly charge of a third-party merchant providing firm service should be less than that of an ABM providing (say) interruptible service to industrial firms. The reason for this is that the distributor does not need to be assured that residential customers exit the system at capacity peak periods.

3. Stranded Costs

In capacity surplus regions, as more residential customers select unbundled service, the distribution utility's merchant service may become exposed to entitlements to gas supply from producers or to pipeline capacity and storage from interstate transmission companies that are no longer required for the remaining customers. Further, if the distributor also provides local storage and supplemental peaking facilities, and residential unbundling provides choice, these services may also become exposed to lower utilization. Thus, the likelihood of significant stranded costs can be a real issue.

The magnitude of these stranded costs may be decreasing as more distributors have included one-year and three-year contracts for pipeline and storage capacity in their portfolios and a secondary market exists in which they can resell additional entitlements on capacity.⁴⁵ Some distributors

43. Contradicting this statement requires the demonstration that the cost to monitor aggregated small-customer gas flows exceeds the cost to monitor equivalent flows for a large customer.

44. Assume a monitoring charge of \$2,000 per month for each third-party merchant. If the merchant has 40,000 customers, then the added cost amounts to \$.05 per month per customer. It should be noted that once one residential customer is added, there is virtually no cost for that customer's aggregators to add another residential customer. The incremental cost to extend service for 30 percent rather than 15 percent of a residential market is negligible, particularly when the number of third-party merchants changes only slightly.

45. The magnitude of stranded costs can be minimized by the following three conditions: (1) the distributor's portfolio of gas commodity contracts and purchased capacity entitlements to multiple pipelines and storage facilities and local supplemental supplies represents a best-cost service; (2) the distributor's portfolio of contracts has market-out termination and renegotiation provisions. These provisions can allow the distributor to quickly exit from the merchant service if warranted by market conditions; and, (3) at the same time that unbundling occurs, the distributor's merchant affiliate is permitted to repackage its portfolios in a way that matches the diverse preferences of its customers.

may have already built into their capacity contracts ratchet-down or *force majeure* provisions that automatically permit ratchet-down entitlements related to customers selecting third-party merchants. Most distributors' portfolios of gas supply contracts include spot and one-year contracts. These trends indicate that the magnitude of stranded costs will likely be small given the adjustments distributors have made in reducing their gas purchasing and upstream transportation costs over the last several years.

4. Low Load-Factor Costs

The fact that customers with smaller gas use typically have low load factors implies their service will be more costly than service to a 100 percent load-factor industrial customer. This fact says nothing, however, with respect to whether a third-party merchant will be more cost effective than the distributor in providing service. Actually, it requires more management skill in obtaining cost-effective service to the low load-factor customer. Hence, permitting competition and market-driven incentives is likely to show greater improvement in reducing costs for the residential sector than for the industrial sector.

There is also the question of achieving the greatest level of firmness required by customers who make small use of gas, for whom it is costly to relight or make sure that their pilot lights are relit, and who do not possess alternative fuel capability. Yet, it can be argued that reliability provided by the distributor through firm contracts can also be achieved by third-party merchants through some combination of long-term contracts and willingness to pay market prices as needed. Peak and back-stop capacity and commodity can be bid away from others or may involve exchanges and backhauls. Reliability in this unbundled service environment may result in an enlarged role for supplementals, as well as knowledge of the price at which other customers will switch to other fuels.

5. System Planning Costs

Does not the uncertainty of whether small (core) customers will actually stay with system sales service in the future, or whether those who had left for another third-party competitor will actually want to come back for system sales, raise the planning cost of the gas distributor? The answer is "yes and no." Competition produces additional risk on system planning. Hence, the LDC incurs additional costs that it must recover. On the other hand, the risks associated with these potential costs pressure the firm to make better management decisions that will tend to reduce the wastes below those of a firm that has a monopoly position. On net, the uncertainty could lower total costs.

D. Funding Subsidized Services

Over the last decade, LDCs, in addition to other regulated public utilities, have had to broaden their corporate responsibilities as part of serving the public interest. For example, LDCs have instituted what are commonly

called demand-side management (DSM) programs, arrearage programs, winter moratorium rules, economic-development programs, general rate subsidies, and low-income programs. These activities generally fall into the category of subsidies, where the benefits accruing to some customers are funded by a broader group of customers. Whether these activities should continue in a comprehensive service-unbundling environment falls beyond the scope of this article. Instead, the following will address whether in a competitive environment LDCs will have the ability to fund social activities either from customers as a group or from shareholder profits. If they do, then the question becomes, *How can it be done in a way that minimizes economic distortions?*

For financial necessity, most nonregulated firms try to minimize their costs and to offer marketable services and products. This implies several characteristics of a firm's behavior.

First, the firm would incur costs only when they add value to the product or service being offered. Other costs, which can be classified as wastes, tend to lower a firm's profits: additional revenues would tend to fall short of additional expenses. Consequently, a firm would normally want to avoid those costs.

Second, a firm would attempt to maximize its revenues given the costs incurred. It would, for example, differentiate its customers on the basis of their demand preferences in order to charge nonuniform prices (that is, to price discriminate) for identical services. Consumers experience this constantly in the products and services they buy. The ability of a firm to price discriminate depends upon its market power. A firm with market power can earn above-normal profits for a sustainable period. Price discrimination represents one way in which a firm does this.

Third, the firm could only temporarily sell a product or service at a financial loss. When the market has a supply surplus, prices would tend to be driven down toward short-run marginal cost. At other times, prices would be driven up, never exceeding the value that consumers placed on the product or service. Selling below cost or subsidizing certain products or services is rarely seen in nonregulated markets. A firm without market power simply cannot remain in business for too long a period if subsidies are embedded in its prices.

An LDC operating in a competitive marketplace will behave more like the firms just described. Its ability to offer subsidized services, although not completely erased, becomes greatly diminished. Imposing surcharges on competitive services to pay for subsidies becomes especially difficult to enforce. The LDC assumes a less enviable position in the marketplace if it is required to pay for certain social activities while its competitors are not. Such payments are inevitably unsustainable, as market constraints would tend to prevent the LDC from earning a normal profit in the long term.

On the other hand, at least for the foreseeable future, the LDC will not be selling all of its services in competitive markets. For example, even in a highly developed service-unbundling environment, the LDC would most likely still have market power in its distribution function. For services

still subject to price regulation, the LDC would have the opportunity to earn normal profits for these services as a whole. Nevertheless, the LDC could not simply attach a surcharge to regulated services in order to fund subsidized services and then expect to earn a normal profit. Some gas customers, such as interruptible customers and customers with viable bypass opportunities, could evade these subsidies by leaving the LDC's system entirely. Because all distribution customers do not have these options, with the approval of regulators the LDC could always use its market power to extract funds from core customers to pay for subsidies.⁴⁶ Even here the LDC has limitations as other alternatives (for example, electricity, and energy conservation) become more attractive with distribution charges escalating to pay for subsidies.

Another funding source for subsidies can originate from the LDC's shareholders. If, for example, a commission allows PBR, the LDC would have the opportunity to earn above-normal profits. These profits could arise from the provision of new and different services, cost reductions, and the execution of flexible and market-based pricing. The LDC could reallocate a portion of these profits to funding the subsidies.⁴⁷ In this instance, the regulator could set a performance target for specified social objectives (for example, a ten percent or less service cut-off rate for low-income households), permit PBR along with competitive-pricing flexibility, and observe after-the-fact the LDC's performance. If the LDC fails to meet the target, the commission could impose a penalty.⁴⁸

The major advantage of this approach over the straight surcharge method is that discretion is left to the LDC on how it wants to satisfy the specified social-objective target. By giving the LDC more degrees of freedom, the target is likely to be reached at a lower cost to the LDC and to gas customers as a whole. The outcome may be similar to the previous outcome — namely, price-inelastic customers funding the subsidy. It is likely, however, that the LDC would search out cost-reducing opportunities that would partially pay for the subsidies. Under a PBR plan, the LDC would have some incentive to do just that.⁴⁹

In sum, the accelerated competition induced by service unbundling would make it more difficult for commissions or legislatures to require LDCs to undertake nonmarket social activities. But as long as the LDC is

46. The same argument, as applied to electric utilities, is contained in Robert J. Graniere, *Post-Reform Continuation of Social Goals* (The National Regulatory Research Institute, January 1996).

47. For a symmetrical PBR plan, however, the LDC could just as easily earn below-normal profits. In this case, no funds would be available for subsidies.

48. A similar approach has been proposed for telephone local exchange companies (LECs). The proposal, called "the minimum subscribership plan," would allow an LEC more pricing flexibility and, at the same time, provide it with an incentive to maintain the social goal of universal service. See Larry Blank, *Balancing Seemingly Conflicting Goals through a Minimum Subscribership Plan: Economic Efficiency and the Risks Borne by Regulators*, presented at the 27th Annual Conference of the Institute of Public Utilities at Michigan State University, Williamsburg, Virginia, December 12, 1995.

49. To the extent that the profits would be reallocated to fund the subsidies, the LDC would gain less from cost-reducing activities. Therefore, its incentives to engage in such activities would diminish.

able to earn above-normal profits for some of its services, or from a certain group of its customers, funding sources for subsidies may be found.

E. Comparability Conditions for Unbundled Residential Access

Successful unbundled-residential access requires that merchants have nondiscriminatory access to the essential facilities and confront the same rules as LDCs. It is far less critical what the specific rules are than that the rules are applied equally.

At the same time, the efficiency gains resulting from unbundled residential access are enhanced with greater breadth in the number of facilities and services unbundled and with more proactive rules that foster a contestable market for the merchant service.

The state regulator will want to focus on establishing a level playing field in which there is customer choice among merchants who operate under comparable rules and opportunities. Salient factors are listed in Table 3. The following discussion of comparability is broken into two parts, namely: (1) issues surrounding essential facilities; and (2) the evaluation of merchants.

1. Comparable Treatment of Essential Facilities

All third-party merchants initially must be provided access to essential facilities which are necessary to provide delivered natural gas service. At the outset, essential facilities associated with natural gas procurement refer to: (1) pipeline capacity or off-system storage which is under contract to the distributor; or (2) storage and supplemental peaking supplies provided by the distributor. At the same time, all merchants must have the right to refuse the *pro rata* offer to acquire their own contractual entitlement to these facilities.⁵⁰ State regulators can incorporate these provisions in their residential unbundling programs. This issue hinges upon the fact that nearly all firm interstate pipeline and storage capacity to serve residential customers is currently under contract to the distributor and, given embedded cost-of-service ratemaking, the prices for these services do not reflect market values (some may be too high, others too low). Local facilities owned by the distributor may also carry rates that differ from their market value. Thus, in some regions, third-party merchants may not be able to provide comparable service without access to these facilities on the same terms as the current distributor. In other regions the third-party merchants may not be able to identify new efficiencies in procurement without contracting from a different mix of supply and capacity providers.

50. This assumes that the resultant stranded costs would be small in relationship to the benefits to consumers for whom the merchant is purchasing gas services.

TABLE 3
COMPARABILITY NEEDED FOR RESIDENTIAL SERVICE
UNBUNDLING

- All merchants have access to all essential facilities
- Distributor treats all merchants equally in regulating gas flows
 - all customers pay same annual access fee
 - each procurement service pays same monthly aggregation charge
- All merchants are evaluated on their efficiency as merchant, not tied linkages to monopolized components of delivered gas
 - utility divests its merchant service, or
 - affiliated entity rules apply to utility's merchant service
- Code of Ethics/Conduct for all merchants (with regulatory oversight)
 - merchants should truthfully represent their service to customers
 - merchants held accountable for potential costs
 - consumers can switch among merchants with certain minimum notification requirements

2. Soundness of the Merchants

Merchants should not misrepresent or mislead their service offerings. Merchants should ensure that no losses will be shifted to the LDC or other parties because of their inability to perform as promised. Clearly, the distributor should not be liable for the costs incurred. Customers knowingly selecting merchants who truthfully revealed the risks should be liable for any unanticipated outcome.

Third-party merchants that provide unbundled residential service require at the outset equal access to pipeline transmission capacity and storage capacity. In regions where pipeline capacity is constrained and under contract to the distributors, third-party merchants require the distributor to release capacity, which it contracted for to serve these residential customers, to the third-party merchant to commence service. Probably, there is little difficulty with this conveyance. Further, this transfer reduces any stranded cost problem to the distributor or pipeline.⁵¹ This requires state regulators to mandate that the utility releases capacity to the residential customer's third-party merchant. On the other hand, in regions that experience surplus pipeline and storage capacity and when multiple pipelines exist, third-party merchants may not want entitlement to the capacity contracts that the distributor was using to serve these residential customers. This situation relieves the state regulator from mandating reassignment of the distributor-pipeline contracts, but raises the issue of stranded costs and their allocation.

In some regions, numerous parties provide storage. The FERC has, in fact, granted certificates to several storage facilities with deregulated terms when a sufficient level of competition exists. Some new storage fields are being developed which provide more economical injection and withdrawal terms. Notwithstanding these developments, the state regulator must

51. The difficulty may arise when the third-party merchant seeks less than a one-to-one reassignment of capacity because it may perceive a more economical option to meet residential load.

actively establish rules permitting reassignment of entitlements to local and purchased storage among alternative merchants. These entitlements may permit the distributor's merchant to possess a comparative advantage and to capture rents in the event the merchant function becomes unregulated. Without such rules, the distributor-affiliated merchant could have an advantage not based upon efficiency.

A state commission will need to address the comparability between the distributor's merchant services and those of other entities competing behind the city gate. The FERC addressed a similar issue at the pipeline level. The FERC resolution, however, may not apply to the issue of comparability among merchants for firm burnertip service behind the distributor's city gate. Most merchants for unbundled residential service will use firm transmission capacity, some of which will be contracted directly, purchased on the secondary market, held by the producer and, at least initially, obtained from the utility's capacity entitlement. With unbundled residential access, the third-party merchant can only compete if the state regulator ensures that these merchants can initially gain access on the same terms as that held by the utility's merchant. Because the third-party merchant is a competitor, this access to capacity whether transmission or storage cannot be assumed to arise through private negotiations with the utility.

F. Eligibility of Customers and Merchants

An often-heard caution of residential service unbundling is whether residential customers have sufficient information to make intelligent choices, and whether eligibility should not be limited since these customers lack the ability to use alternative fuels in the event of a supply disruption. The question arises as to whether the state regulator should establish a high hurdle for a third-party merchant who serves residential customers.

1. Customer Eligibility

Reliability concerns do not necessitate that an alternative fuel is available; gas merchant or gas supply portfolios can provide this reliability. Reliability should be gained through the marketplace, not through some subsidy. The industry is quickly learning that the price mechanism can play an allocating role in providing adequate security to customers. Reliability concerns should therefore not be an obstacle to acquiring unbundled service.

Questions revolve around the knowledge of the residential customer to evaluate different supply portfolios. We do observe consumer preferences for different portfolios. For example, consumers are able to differentiate among different bond and equity portfolios, and different demand deposits. These portfolios contain dissimilar current and future rewards and risks.

Concerning the availability of competitors, residential customers are often viewed as too costly to serve relative to the profit potential on the merchant service. Some industry observers believe there will not be suffi-

cient competition among merchants to serve those residential customers with low gas usage. Both confusion and misunderstanding surround these concerns.

The confusion here relates to the perception that: (1) each customer must have a meter that can be read daily; (2) individual billing costs will be associated with the third-party merchant but not the traditional merchant; (3) a relatively large per-customer access fee will be charged by the distributor; and (4) the high costs associated with serving customers with low load factors will be associated uniquely with the third-party merchant.

First, the usage of a firm residential customer can be statistically estimated based upon past patterns and, hence, be billed as accurately as it is today. Knowing the usage of residential customers who take firm service is easier and cheaper than, for example, knowing the usage of an industrial customer who takes interruptible service.

Second, the current cost to bill the residential customer is relatively high given low usage. This cost does not vanish, but the additional cost imposed upon the utility for city-gate delivery is negligible. The only significant cost is keeping track of aggregated flows in and out on a daily and monthly basis. Yet, these costs are again minor when divided by the total number of residential customers in the aggregator's pool. Thus, there should be no new large fee assigned to residential customers under an unbundled access program.

Third, low load factors are more costly to contract for irrespective of whether services are unbundled or not. The availability of competition among merchants in the provision of this contracting may provide greater opportunity to lower these costs, rather than to drive them higher. Customers will not select this alternative if higher costs result.

2. Merchant Eligibility

If private contracts are not enforceable or if the transaction costs are too high for some entities, then an argument can be made for regulatory intervention. One regulatory action would be to require all merchants to post a bond such that customers would be protected from malfeasant behavior. The regulator must exercise concern that the magnitude of the bonding does not act as a barrier to entry. As one idea, basing the size of the bond on the amount of natural gas being delivered to the customers being served may alleviate this concern. At the same time, the merchant service is likely to have a number of competing merchants, each of whom seeks new customers from others who are themselves not malfeasant. Because contracts will turn over frequently, for a merchant to maintain its customer base it must be responsible and cost effective.

G. The Obligation To Serve

State public utility laws have mandated that local gas distributors accept an "obligation to serve" as part of their obtaining a certificate of public convenience and necessity. This obligation stems from the distribu-

tor's natural monopoly position in the delivery of natural gas. When this legislation was enacted, and for seventy years or so afterwards, delivered natural gas was one packaged product. Within the past decade, this characterization of delivered natural gas has been fundamentally altered by both technological and federal regulatory changes.⁵² Regulators of twenty-years ago, let alone the original legislators, would not recognize today's vibrant natural gas industry with market hubs, independent marketers, third-party providers of storage, electronic bulletin boards (EBBs) providing instantaneous information, futures markets, diverse contract terms, and distributors with multiple pipeline interconnections. Currently, some components that comprise delivered natural gas are still characterized as a natural monopoly; others are best characterized as fully competitive.

The obligation to serve was imposed as a restraint on monopoly power. Because monopoly power no longer exists over the contracting and sale of gas supplies to most consumers of natural gas, both regulators and legislators may want to redefine the distributor's obligation to serve. In those functions for which the distributor still has a natural-monopoly position, such as provision of the grid of pipes, compressors, meters, and the control of gas flows through these pipes, the obligation to serve should remain. In those functions for which the distributor is only one of many who could perform the service, the obligation to serve should be removed from the distributor. Alternatively stated, for any activity under which efficiency-inducing competition can occur, state policy could remove the distributor as a regulated supplier of that activity.

There are two approaches that state regulators can initiate to gain this de-obligation. First, state policy can simply announce a new regulatory framework at some point in the future, and allow the distributor and other parties time to reposition themselves. Second, state policy may allow customers to exercise choice. Thus, customers would voluntarily determine the speed and timing of this transition. The second policy, however, may disadvantage the distributor as a merchant versus its new competitors since it would still incur costs to satisfy the service obligation of those customers who choose to remain. Further, this policy may create artificial distinctions and restrictions that limit the choices available to some customer classes.

To better clarify the dimensions to eliminating the current obligation to serve, four frequently heard statements are identified:

1. *The obligation to serve is still needed for customers making small use of natural gas.* Although in agreement with the views of many state regulators, this assertion has little merit.⁵³

52. Further, customers have experienced lower-priced service when purchasing unbundled service; this observation refutes any validity to the natural monopoly argument that only one firm should exist so that economies of scale or economies of scope can be realized. Yet, as open access evolves, competition among merchants may reveal economies of scale that are achieved by serving national markets.

53. See the earlier discussion on customer eligibility.

2. *The obligation to serve is still needed for customers with a bad credit record.* This is a social issue that should be addressed separately.⁵⁴
3. *The obligation to serve is still needed so that customers wishing to return to the utility can do so.* This begs the question, Why does the customer seek to return to the utility if the utility is selling natural gas as a market-priced service? If market-priced, there will always be others also providing the same service. Mandating an obligation to serve is therefore not necessary.
4. *The obligation to serve is still needed for emergencies.* This has some validity. In the current natural gas industry, price allocates natural gas among alternative users and affects the amount of natural gas produced and taken from storage. No-notice service can be priced and provided by more firms than just the local gas distributor. The provision of no-notice service is similar to load balancing, namely, the distributor as the controller of gas flow is a natural entity to provide these services, but others may also be capable.

The argument here is that the short-term control of gas flows may require some balancing and no-notice service by the distributor. The customer should pay the required price plus some penalty. The regulator must be concerned that the reason other firms have not stepped in may be related to: (1) the specification of an ill-defined service against which they would compete; (2) the fear that they would become regulated; and (3) the nonprovision of timely information needed to enter the marketplace.

The regulator should not eliminate the distributor's obligation to provide backup service for short periods.⁵⁵ This service should be priced at cost plus a penalty. Thus, any event in which wells freeze, supply is not forthcoming, or a financially distressed merchant is no longer in business becomes mitigated. The utility must maintain the integrity of its system. But the utility must also provide timely information such that customers and their agents can voluntarily seek alternatives. By doing so, this "supply-of-last-resort" obligation becomes less crucial, as the market transaction costs for customers seeking other backup suppliers would be reduced.

H. Marketers/Brokers and Unregulated Utility Affiliates

Unbundling residential service requires a sufficient number of merchants or the potential entry of merchants to motivate existing merchants (even if this is only one) to offer the best menu of services at the best price. Without this workably competitive environment, greater deference to market forces cannot be relied upon to foster just and reasonable terms of service. The natural gas market offers many alternatives to the contracting and pricing of delivered natural gas. The merchant for the residential customer would need to constantly exploit these alternatives. The regulator would no longer be making "prudence" determinations on the

54. See the earlier discussion on subsidized services.

55. This implies that an LDC would be required to provide backup service, just as it would be required to provide distribution service. It is assumed that this is an essential component of gas service that, at least for a time, would not be provided in a competitive marketplace.

multitude of individual decisions required. As noted earlier, instead the regulator's effort should foster an environment in which entry and exit⁵⁶ of merchants can occur with ease, while ensuring that residential customers are able to make informed choices on the marketer/broker and the quality of service.

Customers must be able to experience choice in who their merchant is and in the portfolio of terms associated with delivered natural gas. Customers should confront, among other things, alternative prices and alternative price-risk tradeoffs. Many customers place much trust in their current distributor's service; this trust should be continued, but only in an environment in which the distributor's affiliate demonstrates its own superiority as a merchant. Thus, an integral part of residential unbundling is the separation of the distributor's merchant function into its own stand-alone, operationally separate business unit.

1. Affiliated Entity Rules

Unbundling residential services forces a review of the current activities of the local gas distributor. Further, experience suggests that the regulator's ability to establish comparability of service between those merchants tied to other services and third-party merchants is costly and difficult without some separation. Judge Greene's decision to unbundle telephone services entailed the divestiture into separate units; the FERC's unbundling of natural gas interstate pipelines entailed the formation of affiliated entities. State commissions face these same issues with regard to their gas distributors. There is a comfort factor to both the regulator and to a number of consumers in seeking affiliate relationships rather than total divestiture.

The unbundling history at the FERC may be instructive. The FERC initially permitted the pipeline to continue as both transporter and merchant. The FERC issued Order 497, which set forth affiliated entity rules such that pipelines were less able to transfer their monopoly power over transmission to their marketing affiliate via (1) restricted access; or (2) distorted prices. This was followed by Order 636, which required pipelines to exit the merchant function but permitted these activities to be transferred to an unregulated marketing affiliate. Order 636 again relied upon principles in Order 497, which established arms'-length transactions, separate staff, separate location and facilities; but Order 636 also set forth stiffer reporting requirements. For example, discounts from a pipeline to its marketing affiliate must be immediately posted on the pipeline's EBB, whereas this was not required between the pipeline and third-party merchants.

56. The regulator who raises the cost of a merchant exiting, for example by indemnifying its customers from any costs resulting from the merchant's decisions, raises the cost of entry. By acting as a barrier to entry, existing merchants could earn excessive returns or provide portfolios with higher costs than what would otherwise exist. This highlights the problem posed — how to ensure the benefits of competition while, at the same time, avoiding any undue harm.

2. Necessary Rules For Efficient Service

Socially desirable regulatory policy should be directed toward creating a level playing field for the merchants servicing residential customers. It should also create an institutional setting such that this competition generates the greatest benefits and the most efficient levels of service. Unbundled service cannot be efficient without comparability, which was discussed earlier, but comparability *per se* is not sufficient: efficiency depends also upon several additional factors. These are shown in Table 4.

a. Extent of Unbundling and Rules on Contracting

Customers should be able to choose among merchants who not only procure the commodity but also arrange transmission capacity, storage facilities, local peaking service, and perhaps the provision of back-up supplies and load balancing. The degree of efficiency improvement increases with the greater number of services available for the merchants to arrange.

State regulators must also determine if the market for each service is contestable. This determination is not based simply on the number of merchants serving residential customers but whether entry would occur that would discipline and drive prices to competitive levels. Contestability hinges on the ease of potential entry and exit for each of these services, not upon the number of alternative merchants currently providing these services. For those services which are contestable, the state regulator may want to defer to the market for the determination of just and reasonable rates and the variety of portfolios offered.⁵⁷ Once the market is judged contestable, fewer regulatory constraints can be placed upon the provision of multiple services by the distributor's affiliate merchants. Thus, the affiliated merchant need not be hamstrung by offering only one gas procurement package; rather a portfolio of packages can be offered to meet the variety of preferences of the residential consumers.

TABLE 4
NECESSARY RULES FOR EFFICIENT SERVICE

- Competitive services should be unbundled.
- All merchants can contract for commodity, transmission and storage capacity in whatever manner they deem best.
- For contestable services, all merchants can charge market-based prices and provide multiple services.
- Information on gas flow balances is easily obtained.
- Information on alternative prices charged by various merchants is also easily obtained.

57. State regulators may have greater ability to defer to market prices when the market is deemed more competitive than often alleged. For example, the Economic Regulatory Administration was charged by Congress to make just and reasonable determinations on the importation of natural gas supplies into the United States. The Energy Regulatory Administration ruled in the 1980s that the market for importing natural gas into the United States was competitive; thus, voluntary contracts for this importation must by definition meet the regulatory requirement of being just and reasonable. The courts have upheld this reasoning.

- Administrative fees charged for a merchant's service are minimized, fees for nominations and balances are by aggregated pool, and trading is permitted among aggregated pools to lessen imbalances.
- Penalties for imbalances do not act as an undue barrier to entry.

b. Administration Costs Minimized

State regulatory policy should not establish conditions that would make unbundled services prohibitively expensive and preclude the entry of any third-party.

c. Market-Based Rates for Unbundled Competitive Services

Market-based rates will reflect the current marginal value and the cost of the service provided. These latter linkages should result in the greatest social welfare by encouraging physical and allocative efficiencies. Market-based rates are governed by privately negotiated terms and are often entirely flexible and adjust immediately to changing conditions.

d. Charges Associated with Unbundled Services

To minimize the barriers to entry, administrative fees should apply to all residential customers including those taking service from the merchant affiliate of the distribution utility. All customers taking the same service from the same merchant should be treated as part of one aggregated pool.

Penalties on imbalances should discipline merchant behavior and exceed cost of service. They should not, however, exceed costs at which these penalties start to act as a barrier to entry.

e. Information Sharing

Better decisions result when the cost of acquiring information declines. Thus, in permitting unbundled residential service, state regulators should try to seek an institutional environment in which: (1) the distributor gains revenue when more efficient throughput is achieved; and (2) customers can more easily determine which merchant best provides the service they seek. If the state regulator establishes the right incentives, information sharing may result naturally, that is, without mandates by the regulator.

Experiences with interstate gas transmission demonstrate that EBBs along with capacity release facilitate greater utilization of the pipelines by those who place the highest value on natural gas. For example, UGI, a Pennsylvania distributor, used its leased storage in 1996 for very short-term off-system sales and considered purchasing peaking capacity from other LDCs.⁵⁸ During the cold snaps of January-February 1996, EBBs and capacity release assisted some customers, who could shift to alternative fuels, to assign their gas supply and capacity to others, presumably with

58. Burgess Consulting, Inc., *Stratified Management Audit of UGI*, Pennsylvania Department of Public Utilities, 1997.

higher value.⁵⁹ That is, greater physical and allocative efficiency has resulted from the EBBs and capacity release.

Extending the EBBs and capacity release at the distributor level may also be desirable.⁶⁰ If the utility provides a distribution function as a stand-alone service and if the distributor's profit hinges on the throughput, the distributor has its own internal incentive to make lower-cost information available to potential users. The distributor in an unbundled service environment may seek to provide its own EBB service. Further, the utility's merchant would be one customer seeking to make use of this service. The distributor would maintain the EBB; it would develop a format code to facilitate customer switching among merchants and the aggregation of the prior uses and projected future use.

Consumers also require ease of gaining information on likely differences in costs among different merchants. In most markets, current price differentials can be observed by calling suppliers and reading informational advertisements. Periodically, newspapers and other private entities publish the prices and terms of different merchants. There is no reason to suspect that such reporting cannot occur for residential gas service, even if the state regulator shows total benign neglect. The state regulator could, without getting into regulating the merchant service, seek to have alternative prices for different portfolios of each merchant become reported to the commission and publish summary information on an annual basis. Greater access to this information would help drive the unregulated prices to competitive levels.

VI. GUIDING PRINCIPLES

The acceptability of residential service unbundling hinges largely on its compatibility with prevailing regulatory objectives. The fundamental argument in support of such unbundling is that it would expand market opportunities for all retail gas customers. In achieving this outcome in a way that promotes regulatory objectives, certain conditions need to be met. Unbundling *per se* in the absence of certain regulatory changes can, on net, cause more harm than good.

As previously discussed, changes in obligation-to-serve rules, pricing methods, and the regulatory ratemaking paradigm itself will be needed to assure that unbundling improves the economic performance of the retail gas sector. Guidelines for residential service unbundling require a set of principles from which policy directives can be formed. Eight major principles, consistent with the previous discussion in this article, include:

1. *The more service choices available to customers, the better off these customers generally are.* Service unbundling allows customers to choose

59. Brian White, *System Operations During the 1995-96 Winter Heating Season: A Report of the Gas Transportation and Supply Operations Task Force*, GAS ENERGY REV., (July 1996).

60. Atlanta Gas and Light has proposed to unbundle and to provide open access and customer choice. This proposal includes EBBs within the distributor's grid and rights to resell capacity. See Edwin Overcast, *A Framework for Georgia Regulation of Natural Gas Delivery Service*, delivered before the Georgia Legislative Study Committees (October 1996).

among different gas services and providers in a way that enhances their economic welfare. As a general rule, customers prefer to have more choices in the products and services they consume. Repackaging of unbundled services should be an integral part of any policy to give customers more choices.

2. *At least temporarily, LDCs should offer bundled sales service as an option (for example, a "recourse service") for residential customers.* Some residential customers may believe that cost savings from switching gas supplies are minimal and that the highly reliable service they demand can only be provided by bundled sales service. Bundled service represents one alternative that some customers, for different reasons, may prefer. At least during the initial years of residential service unbundling, customers should have the opportunity to stay with bundled sales service offered by the LDC if so desired.
3. *Any party providing services shall be highly dependable.* Since the cost of interruptible service to most residential customers is extremely high, third-party gas providers should demonstrate their ability and willingness to serve those customers on demand. Some residential customers may be willing, however, to accept less reliable service. For those customers, the market would allow them to pay a lower price for gas service.
4. *The LDC should be compensated for any costs imposed upon it by a third party (for example, an aggregator or marketer).* Additional costs and risks forced upon the LDC should be paid for by those directly benefiting from service unbundling. Externalizing risks, for example, represents a form of cost shifting that conveys a false signal to customers assessing the benefits and costs of unbundled services.
5. *The LDCs' obligation to serve as the supplier of last resort should be compatible with the compensation received for the provision of these services.* If the LDC is required to provide backup and other "insurance" services to assure customers high reliability, it should receive adequate compensation. Backup service or any service made available by the LDC should be compensatory in that revenues, at a minimum, cover costs.⁶¹
6. *The LDC should be required to unbundle as many services as deemed consistent with improving the economic well-being of retail customers.* In theory, service unbundling can be excessive. It is likely, however, that many individual services beyond the city gate can be sold competitively and priced separately.
7. *The LDC and competing gas service providers should have equal opportunity to sell in the retail market.* When equal opportunities fail to exist, it becomes difficult to ascertain whether those supplying gas services are actually the lowest-cost providers. As a basic requirement for efficient markets, all suppliers should be subject to the same rules.
8. *Regulatory rules should correspond to the degree of competition induced by service unbundling.* As markets become more competitive, regulators should lighten their control over a firm's prices. Tight regulation of services subject to competition can jeopardize the regulated firm's market position as well as the benefits to customers.

These eight principles should help to maximize the benefits of service unbundling to both customers and society at large. They would achieve this by endorsing the general premise that customers benefit when they have more service options and society gains when risks become internalized to the decisionmaking party. Further, the principles presume that

61. As noted earlier, a penalty may also be attached to discourage merchants from excessively relying on backup service.

most residential customers will continue to demand highly reliable service, irrespective of the service provider.

Lying behind some of the above principles is the need for the proverbial "level playing field." From an economic perspective, this condition will guarantee that those service providers with the lowest costs will prevail over their competitors. Achieving this efficient outcome requires the following state of affairs: (1) sufficient pricing flexibility for all potential gas-service providers; (2) availability of both bundled and unbundled services; (3) market-accommodating regulatory rules; (4) no government-induced costs (for example, low-income assistance) unevenly spread across the different service providers; (5) nondiscriminatory access to essential facilities by all service providers; (6) the elimination of cross-subsidies or cost-shifting that would favorably position the regulated entity in relation to its competitors; and (7) compensatory pricing of services provided by the LDC for the benefit of unbundling customers or their agents.

It is expected that the different service providers would expend considerable resources in making sure that the playing field is tilted in their favor. Marketers, for example, would want to be charged the lowest price for complementary services provided by the LDC and to have favorable access terms to essential facilities. Consumers would want choice and lower prices, which means that they would prefer a world where unbundled services and bundled services coexist. The LDC would want the opportunity to compete, to earn higher profits in competitive or quasi-competitive markets, and to be relieved of what they consider to be burdensome regulatory obligations (for example, social activities and traditional service obligations). Finally, regulators would want an "everyone wins" outcome where no stakeholder loses and to be perceived as advocates of procompetition in light of prevailing political and market pressures.

Overall, three general conditions are required for a "level playing field" or, to put it similarly, a competitive environment that guarantees economic efficiency. They are: consumer choice of different service providers, no regulatory price or entry barriers, and nondiscriminatory access to essential facilities. When these conditions exist, in most situations competition is both robust and socially beneficial.

VII. CONCLUSION

When all is said and done, the fundamental question for regulators comes down to whether residential service unbundling would benefit residential customers more than other policy alternatives. If state PUCs believe that all retail gas consumers should directly benefit from competition by having market choices, then residential service unbundling will be viewed as an attractive policy. Service unbundling allows consumers the ability to search out the best deals and select among different service providers so that they can maximize their economic well being. As shown with the experiences in other, previously heavily monopolistic industries, service unbundling in addition to reflecting the symptoms of a competitive marketplace is a driving force for accelerating competition in an industry.

Few observers would contest the benefits from service unbundling that have already accrued in the natural gas industry, both in the pipeline sector and for large retail consumers. A greater number would question, however, whether service unbundling for small retail consumers would be good public policy as well. A common view is that small consumers would really not want to make choices because of high transaction costs, and would demand highly reliable service that only bundled sales service could provide. This article questions the validity of these perceptions. For example, load aggregation by marketers should significantly reduce transaction costs for individual consumers, and the combination of contracts and regulation should maintain reliable service to those residential consumers who take unbundled service.

Compared to large customers, it is likely that more small customers would want to retain bundled sales service. From a public-policy perspective, this implies that residential customers should have the right to choose between unbundled and bundled service. Forcing all residential customers to take unbundled service would restrict their choices, with some customers expected to be worse off as a result.

One major issue currently before state PUCs is how small gas customers can benefit more from competition in the natural gas industry. In some states, the discussion has shifted from how to protect small customers to how to give these customers the same market opportunities as large customers. In other states, preventing small customers from paying higher rates because of competition in large-customer markets has become the dominant policy. For these states, performance-based regulation and allocation of revenue credits earned in noncore markets to core markets represent possible ways to protect small gas customers. If a commission wants to go beyond "protecting small customers," service unbundling seems to be the logical and most meaningful alternative.

Expanding the scope of service unbundling should accelerate competitive pressures in the retail gas sector. If done correctly, residential service unbundling should improve economic efficiency in the natural gas industry. It will induce both regulators and LDCs to terminate existing cross-subsidies and inefficient rate designs, encourage the entry of cost-efficient service providers, allow customers more choices of service providers, and impel LDCs to be more cost conscious and customer responsive.

For these benefits to happen, however, regulatory rules will need to change. As noted earlier in this article, existing rules are premised on a highly monopolistic retail gas market. Expanded service unbundling will engender strong competitive pressures in the retail gas market. Leaving existing regulatory rules in place will likely produce transitory distortions that would seriously undermine or greatly diminish the societal benefits that service unbundling can offer. This article outlines a set of general and specific guidelines that public utility commissions can apply to mitigate these distortions and, in the process, maximize the societal benefits from service unbundling.