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AN ANALYSIS OF ELECTRIC POWER INDUSTRY REFORM IN ALBERTA

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EXECUTIVE SUMMARY

The first step of the standard approach to reforming a regulated industry is to change the laws that govern its operation. Alberta Canada's provincial government has taken this step with the passage of a revised *Electric Energy Marketing Act*. The new legislation places Alberta's regulated utilities in a better position to respond to the long-term threats of a more competitive market for generation services by providing them with incentives to become cost efficient and more profitable over time. However, Alberta's government also expects that the revised law will launch a sustained downward trend in retail (regulated) electricity prices over the long term.

Alberta's government has not only taken a long-term approach to the reform of its electric power industry; it has chosen to move cautiously along the path to a more competitive generation market. By government fiat, nonutility generators cannot come between retail customers and regulated utilities because nonutility generators cannot compete with regulated utilities for old or new retail electric load. As long as this *ad hoc* restriction on the marketing activities of nonutility generators is continued, these companies cannot expect to acquire large shares of Alberta's generation market. Also by government fiat, Alberta's regulated utilities will retain their control over Alberta's transmission grid. Consequently, at present, neither a PoolCo nor an independent system operator is part of Alberta's long-term approach to the reform of its electric power industry, which means that Alberta's government wants its regulated utilities to remain vertically integrated.

Alberta's government has taken every opportunity not to disturb the existing prices for retail customers because these prices are low in comparison to retail electricity prices in other Canadian provinces. In addition to prohibiting retail competition and institutionalizing vertically integrated regulated utilities, the Government has made it very difficult for a nonutility generator to displace a

regulated utility in the markets for existing and new wholesale power loads. With respect to an existing load, the sufficient condition for its capture by a nonutility generator is that the average cost of the nonutility generator, which includes fixed and variable costs, is less than the average variable cost of the soon-to-be-displaced regulated utility. With respect to a new load, the same sufficient condition holds if and only if the regulated utility has excess capacity. Otherwise, a regulated utility and a nonutility generator have equal footing in competitions for new wholesale load. However, when there is equal footing, these competitions hold out strong promises of lower retail prices over time because stranded costs are not created and the company with the lowest average cost wins the right to serve the new wholesale load.

The purpose of this paper is to analyze the dominant features of Alberta's electricity reforms. An important aspect of this analysis is to predict the behavior of regulated and unregulated companies after industry reform. Vertically integrated regulated utilities are expected to expend a significant amount of money on implementing open access and service comparability. They also are expected to lower their generation costs by managing their resource portfolios efficiently. Nonutility generators are expected to compete aggressively for new wholesale load in service territories where the regulated utility does not have excess capacity. Large municipally owned utilities are expected to be on the top of the nonutility generators' marketing lists. Small municipally owned utilities are expected to organize themselves into cooperatives to increase their buyers' power in the wholesale market. Finally, municipalities without their own utilities, but with large-volume retail users, are expected to seek the station of wholesale customer in an effort to cash in on open access, service comparability, and wholesale competition.

Alberta's effort to capture the benefits of lower prices, lower costs, more products and services, and more innovation induces several other characteristic behaviors. Because the regulated utilities continue to be vertically integrated after industry reform, they are expected to engage in anticompetitive behavior when they

believe that they have to subsidize their generation services to ward off the competition for new wholesale load that is threatened by the nonutility generators. Municipalities with newly acquired wholesale customer status are expected to make bilateral trades to meet new short-term wholesale loads. The operation of Alberta's transmission grid is expected to be overseen by a regulated transmission administrator that is best described as a utility-dominated staff organization that is responsible for managing and operating the utility-owned transmission grid in conformity with the principles of economic dispatch.

Another important aspect of this analysis is to understand how Alberta's government has chosen to deal with the stranded-cost and transmission-pricing issues that arise during the reform of a regulated industry. The Government has dealt with the stranded-cost issue by proposing a system of reservation payments that the regulated utilities collect from the transmission administrator and distribution companies. These payments are structured to ensure that the utilities recover all of their annualized fixed costs, including the fixed costs of existing investments that are stranded by competition in the wholesale market. It has dealt with transmission-pricing issues by proposing postage-stamp transmission rates for existing wholesale loads and distance-sensitive transmission rates for new wholesale loads. To some extent, both of these decisions insert a measure of economic efficiency into Alberta's transmission market.

However, Alberta' reform effort conceivably can reduce the competitive forces operating in its wholesale market for electric power. Reservation payments make it more difficult for a nonutility generator to displace a utility that is serving existing wholesale load or has excess capacity. Distance-sensitive transmission rates are apt to make it more difficult for a nonutility generator to serve new wholesale load. Perhaps, these two rate structures exist because Alberta's government is uncertain about the reliability and availability of a large volume of electric power from nonutility generators. Still, Alberta's reform effort represents the cautious support of competition at the wholesale level.

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FOREWORD

This short study analyzes the dominant features of the Province of Alberta's reforms in the electric power sector. The analyst tries to predict the likely behavior of regulated and unregulated companies in the aftermath of reform. Much of the focus of this report is an examination of what aspects of reform point to greater competition in the sector and what aspects point away from it.

Given the great interest in regulatory restructuring, the treatment of stranded costs, and transmission pricing issues in the U.S. case, it is instructive how counterpart Canadian regulators are dealing with these important matters.

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INTRODUCTION

The reform of a regulated industry is a two-stage process. New laws pertaining to the industrial organization of the regulated industry are passed in the first stage. They may reflect a vision of the future of the affected regulated industry, or they may impose a particular structure on its regulation and operation. Two federal laws dealing with the reform of the United States' electric power industry have done both of these things. The *Public Utilities Regulatory Policy Act of 1978* installed the conservation of natural resources used to produce electric power and the innovative pricing of electricity sold to retail customers as legitimate reforms. The *Energy Policy Act of 1992* assured that competition is in the future of the generation sector of the United States' electric power industry.

The second stage of the process is the promulgation of regulatory rules that implement the legislatively endorsed industry reforms. In the United States, this stage of the reform process is controlled by the *Administrative Procedures Act of 1946*. This federal law codifies the procedures that prevent arbitrary and capricious rulemaking behavior by any government agency. State and federal agencies have to issue a notice of proposed rulemaking before they can approve a new rule change or a new rule. Furthermore, they have to allow interested parties to participate in their rulemaking by providing them with the opportunity to comment on the proposed rule or rule changes. In addition, they have to consider the views of these interested parties in a fair and impartial manner. Finally, after assimilating these views, they have to justify the adopted rule in writing.[1]

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[1] The foundation for the written justification is the record that is created by the participation of the parties interested in the rulemaking. The record can be created by direct testimony and cross examination, or it can be a compilation of written comments to the agency. In either instance, agency representatives and representatives of the interested parties are provided with an opportunity to review and digest the legal and public-policy positions that are held by others.

The first stage of the reform of Alberta Canada's electric power industry has been completed with the passage of a revised *Electric Energy Marketing Act*. This new legislation empowers regulatory authorities to promulgate regulatory rules that support fair and open competition.[2] The revised law's objective is to create a competitive generation market that places downward pressure on electricity prices over the long term.[3] This result is to be obtained by providing Alberta's regulated electric power companies with incentives to become more efficient and more cost conscious over time. Essentially then, the revision of the *Electric Energy Marketing Act* represents a structured effort on the part of Alberta's government to better position Alberta's regulated electric power companies in a more competitive generation market.

Four different generic approaches to industry reform were available to Alberta's planners, strategists, and government officials. Each generic approach caters to a particular set of public-policy objectives, and therefore, each one presents a different set of incentives to Alberta's regulated electric power companies. The purpose of this paper is to analyze the essential features of Alberta's reform effort. The organization of the paper is as follows. The four

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[2] The revision of the *Electric Energy Marketing Act* occurred with the support of all branches of Alberta's government. The Executive Branch supported the proposed reforms from the onset of the legislative process. The Alberta Department of Energy, with the support of the Executive Branch, convened a Mayors' Committee and a separate Steering Committee to discuss the reform of Alberta's electric power industry. The Mayors' Committee provided municipal leaders in Alberta with the opportunity to contribute to the rewriting of the law. The members of the Steering Committee were drawn from a cross-section of consumer and industry groups, and these individuals agreed to a consensus proposal for the reform of the electric power industry. Its proposal was circulated for review and comment in October of 1994. Legislation based on the consensus proposal was introduced on May 2, 1995. See: Rick Hyndman, Larry Charach, and Bryan DeNeve, "Restructuring the Alberta Electric Industry," Mimeo, presented by the Alberta Department of Energy at The Ninth Annual Regulatory Educational Conference, which was sponsored by The Canadian Association of Members of Public Utility Tribunals (CAMPUT) at The Rimrock Resort Hotel in Banff, Alberta Canada from May 7 through May 10, 1995, 9.

[3] Alberta's regulated electric power companies are not facing much competition at present because electricity prices currently are low in this Canadian province. In recognition of this fact, Alberta's industry reform does not have an immediate or rapid impact on existing electricity prices. See: Ibid.

generic approaches to the reform of an electric power industry are discussed in the next section. The analysis of Alberta's reform effort is presented in the following section. Conclusions are presented in the final section.

GENERIC APPROACHES TO THE REFORM OF THE ELECTRIC POWER INDUSTRY

A Working Group, which was convened in 1994 at the request of the California Public Utilities Commission, has identified four generic approaches that may be used to reform the generation sector of the electric power industry.[4] Each approach is examined below.

Exclusive Use of Bilateral Contracts

Bilateral contracts are legally enforceable agreements between pairs of buyers and sellers of goods and services. Their purpose is to describe and nail down the legally acceptable behavior between them. A buyer, for example a wholesale customer, and a seller, for example a nonutility generator, may enter into a bilateral generation contract that describes the terms and conditions for the production and purchase of a pre-specified amount of electric power.[5] Because this legal document only affects the behavior of the particular pair of buyers and sellers, the seller, in this instance a nonutility generator, would have to enter into a bilateral transmission contract with a transmission company to arrange for

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[4] Working Group Report, "Options for commission consideration," TMs, In Response to Decision 94-12-027 of the California Public Utilities Commission OIR. 94-04-031/OII. 94-04-032, 22 February 1995.

[5] A retail customer can act on his or her own to arrange for the purchase of electric power with its supplier of choice, or a retail customer can enter into a bilateral delivery contract with an energy marketer who, in turn, enters into bilateral generation contracts with its suppliers of choice.

transmission-access service.[6] Meanwhile, the buyer, in this instance a wholesale customer, would have to enter into a bilateral transmission contract with the transmission company for transmission service.[7]

Ideally, bilateral contracts represent commitments that obligate the pairs of contracting parties to behave in accordance with a standard that is higher than simply intending to honor their promises. The essence of an ideal bilateral contract is that neither contracting party ever considers breaching it when a better deal comes along.[8] However, it is well-known that no actual bilateral contract is a commitment in this sense.[9] As a result, an actual bilateral contract is enforced formally and informally through threats of future retaliation that are based in existing customs or contractual laws.

The reality of a bilateral contract is that it represents only a potential sequence of acts that govern the interaction between the signers. Of course, this sequence has a high continuation probability, which means that each prescribed act is likely to occur as expected. However, it is well-known that expectations often are disappointed for a plethora of reasons. It may be as simple as a better deal coming along, or it may be as complicated as a bankruptcy that prevents one of the pair of contracting parties from performing the expected acts.

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[6] Transmission-access service connects the nonutility generator, the seller, to the transmission company's transmission network. It is the transmission company's responsibility to make any necessary interconnections with the transmission grid.

[7] Transmission service brings pooled electric power that now is the responsibility of the transmission company to the buyer's gateway. Since the buyer is a wholesale customer in this case, the gateway typically is an entrance point to the wholesale customer's distribution system. When the buyer is a retail customer, the gateway is an entrance point to the distribution system of the retail customer's serving distribution company.

[8] Ken Binmore, *Playing Fair*, Game Theory and the Social Contract, vol. 1 (Cambridge, MA: The MIT Press, 1994).

[9] Thomas Schelling, *The Strategy of Conflict*, (Cambridge, MA: Harvard University Press, 1960).

Typically, punishment clauses are pressed into service as protection against breaches of contracts. Usually, these clauses spell out monetary punishments. However, money may not be enough to compensate a buyer for the adverse effects that may accompany the breach of contract for the production of electric power. A buyer needs assurances that he or she can obtain replacement power on a timely basis at reasonable prices. This need typically is not accounted for in the terms and conditions of a bilateral generation contract. Usually, it is satisfied through the operation of an efficient spot market for electric power. Because regulatory authorities may be viewed as having the obligation to ensure that buyers can obtain adequate, safe, and reliable electricity upon demand, they would seem to have the responsibility of assisting in the development of an efficient spot market. They also may be responsible for creating an environment that is favorable to the evolution of other market-based institutions providing insurance against the unexpected costs of contract breaches.[10]

However, regulatory authorities have responsibilities other than providing protection against breaches of contracts. An electricity market, which is comprised exclusively of bilateral generation contracts, cannot function adequately without a system operator to maintain system reliability, to manage emergencies, and to settle physical imbalances on the transmission grid.[11] Therefore, regulatory authorities have to promulgate regulatory rules that ensure the independence of the system operator from the influence of the regulated companies that own competitive generation companies or regulated distribution companies.

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[10] For our purposes, an institution is a structured decisionmaking process that is supported by a belief that a well-regarded history exists concerning the appropriateness of past decisions. A commonly encountered institution is a regulatory rule defining acceptable behavior within a regulated environment. See: Gerald W. Brock, *Telecommunications Policy for the Information Age: From Monopoly to Competition* (Cambridge, MA: Harvard University Press, 1994).

[11] William W. Hogan, "Reshaping the electric industry," Mimeo, Center for Business and Government, John F. Kennedy School of Government, Harvard University, Cambridge, MA, 17 November 1994.

As an independent entity, the system operator is an impartial coordinator of pooled electric power, who, to the extent practicable, balances the electric loads on the transmission grid in a manner that is consistent with the terms and conditions of the myriad of bilateral transmission contracts that it has entered into with buyers and sellers of electric power. More specifically, this new addition to the organization of the electric power industry is responsible for doing only what is necessary to ensure that a transmission fault does not occur because the terms and conditions of the bilateral generation contracts are inconsistent with the physics and dynamics of the transmission grid. In other words, its job is to ensure that the physical dynamics of the transmission grid are satisfied without regard to the prices for the blocks of electric power that are necessary to achieve this objective. Because its duties are limited to the physical operation of the transmission grid, the independent system operator is not responsible for the economic coordination of pooled electric power. Furthermore, it is not responsible for keeping abreast of the offers to sell electric power on the spot market. Finally, it is not responsible for being a market maker for the spot market. Consequently, the independent system operator may find itself in the position of not substituting less-expensive, spot-market power for more-expensive contract power.

Because the independent system operator is not under any obligation to inform buyers that less-expensive electric power is available to them on the spot market, it is apparent that some other company has to take on the responsibility of being the market maker for the spot market, if bilateral contracting for generation services is to function smoothly. The market maker would find it profitable to keep abreast of the offers to sell electric power on the spot market, if it could add value to these offers. Perhaps, this second addition to the organization of the electric power industry could add value by sorting the spot-market offers by price and location to enable the independent system operator to choose the proper mix of spot-market power to correct physical imbalances that are created by the self-nomination aspects of bilateral generation contracts. In addition, this new company

might add value by providing an economic coordination function that would lower the overall cost of electric power to buyers.[12]

Clearly, bilateral contracting for generation services represents "free-wheeling" industry reform. Wholesale and retail customers are empowered to purchase electric power from any utility-owned generation company or nonutility generator that has the capacity to produce the desired levels of power. In addition, these customers are permitted to purchase directly the unbundled transmission and distribution services that are required to meet their particular needs. Meanwhile, regulatory authorities agree to assist in the development of institutions that preserve the competitiveness of the generation sector of the electric power industry by preventing predation, cross-subsidization, cost shifting, tying arrangements, or differentiated access to bottleneck and essential transmission and distribution facilities.

However, it is important to note that bilateral contracting for generation services does not prevent retail customers from buying bundled electricity services from their host local distribution companies.[13] Bundled retail electricity services are preserved under bilateral contracts because rural cooperatives, municipally owned utilities, and utility-owned local distribution companies can act as agents for the retail customers that still want to buy bundled services. These three types of distribution companies can enter into bilateral contracts with generation companies for the purchase of electric power at competitive wholesale prices.[14] Next, they

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[12] Economic coordination requires the market maker to inform buyers and sellers that less-expensive, spot-market power is being substituted for self-nominated power. In addition, the market maker's task is to manage the spot market in a manner that ensures the displaced sellers recover their fixed costs when less-expensive power is substituted for more-expensive power.

[13] A bundled electric service consists of the bundling of the unbundled generation, transmission, and distribution services that are sold directly to wholesale customers and those retail customers that do not desire bundled electricity services.

[14] These generation services may be purchased from a generation company that is owned by a utility, or they may be purchased from nonutility generators.

can enter into bilateral transmission contracts with the independent system operator to ensure that the purchased power reaches their locations. Finally, they can use their distribution systems to meet the needs of their retail customers that continue to buy bundled electricity services.

Community Access to Wholesale Power

A workable market for bilateral generation contracts relies on buyers and sellers that are comparable with respect to bargaining resources and negotiation skills. Typical wholesale customers and large industrial customers meet these criteria, but most commercial and residential customers do not. The smaller volume retail customers are not used to negotiating electricity prices. In addition, these end users cannot wield any buyers' power against generation companies. Community access to wholesale power helps to elevate the status of these weaker customer classes. Essentially, it is a mechanism to organize small-to-medium-use retail customers into effective customer-owned cooperatives.[15]

The cooperative's management is expected to purchase electric power in sufficient amounts from all types of producers to meet the expected needs of its membership. Next, its managers are expected to obtain transmission services from a regulated transmission company and distribution services from regulated local distribution companies. To function effectively at these three activities, they are expected to use the cooperative's buyers' power to negotiate lower overall prices for their members, as compared to the prices that their members could have obtained by acting alone. In effect then, cooperatives act as brokers between their

[15] Of course, customer-owned cooperatives are not the exclusive domain of the small-to-medium-use retail customers. Cooperatives can contain entire municipalities, entire counties, or entire water districts. Therefore, community access is a vehicle for municipalization as the market for generation services becomes more and more competitive.

members, the regulated transmission company, the regulated distribution companies, and the unregulated generation companies.

Community access is an aggressive type of industry reform. It introduces a new element into the organization of the electric power industry that acts as a substitute for the marketing functions of regulated distribution companies. These customer-owned cooperatives provide bundled electricity services to their retail customers. They set their own retail electricity rates for their members. However, they do not acquire distribution facilities or other physical assets to compete with the regulated distribution companies on a facilities basis.[16] Consequently, regulatory authorities require the distribution companies to provide them with distribution services on a nondiscriminatory basis.

Economic Coordination of the Transmission Market

Bilateral contracting for generation services leaves the economic coordination of the generation market to an entrepreneur that adds value by lowering the buyers' costs. The PoolCo concept has been suggested for this purpose.[17] A PoolCo is the extension of the independent system operator. Whereas the independent system operator is responsible solely for the faultless coordination of the physical transmission grid, the PoolCo is responsible for the physical coordination of the grid and the economic coordination of the generation market. Operationally, the PoolCo economically dispatches all of the participating generation sources in a manner that is consistent with the physical limitations of the transmission grid that it oversees. Consequently, a seller's self nomination of a particular generation unit ensures only that the power from this unit is dispatched when it is economically correct to do so.

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[16] Working Group Report, "Options for commission consideration."

[17] William W. Hogan and Larry E. Ruff, "Reshaping the electricity industry: Competitive market structure and regulatory policy," Mimeo, prepared for the Wisconsin Electric Power Company, 1 November 1994.

The PoolCo concept surely furthers wholesale and retail competition when the PoolCo's management is separate from the managements of generation and distribution companies. This arrangement ensures that the PoolCo as an economic dispatcher does not have any conflicts of interests. There are two reasons why the absence of such conflicts is required for the emergence of an efficient market for bilateral generation contracts. First, the PoolCo is the only company that is empowered to transport electric power from generation sites to distribution gateways. As a result, conflicts of interests would cause the PoolCo to consider giving preferential transmission services to some buyers of electric power and preferential transmission-access services to some sellers. Second, the absence of any conflicts provides assurance to regulatory authorities that the market for electric power has the potential to be efficient because the PoolCo is in the position to provide transmission and transmission-access services in a nondiscriminatory manner.

However, the creation of a PoolCo does raise jurisdictional regulatory issues. It appears that the regulation of the PoolCo is beyond the reach of state regulatory authorities when bilateral contracting is restricted to wholesale electricity sales. Yet, the PoolCo apparently is regulated dually by state and federal authorities when retail customers sign bilateral generation contracts. Furthermore, the regulatory authorities in these two jurisdictions may be called upon to assist the PoolCo in finding ways to make the economic coordination of the generation market consistent with the terms and conditions of the bilateral contracts between buyers and sellers. Some regulatory effort is required in this regard, if regulatory authorities are to avoid mediating or arbitrating disputes between buyers, sellers, and the PoolCo when the PoolCo chooses not to dispatch the generation facilities that are nominated by the buyers and sellers in the bilateral generation contracts.

For example, regulatory authorities may be asked to adopt the rule that sellers enjoy the full gains and suffer the full loses of the PoolCo's economic dispatch. However, the survival of this rule will be determined by the magnitudes

of the gains and losses that the sellers experience when the PoolCo substitutes spot-market power for contract power. If the gains and losses are substantial over time, a rule of this type would not be satisfactory to anyone. Why? Stockholders will be unhappy about large losses, and buyers will be dissatisfied with their contracts when there are large gains. Alternatively, regulatory authorities may be asked to adopt a system of rebates and surcharges that equalizes the prices of economically dispatched electric power and the prices of contract power. The essence of this system is the equality of the *ex post* prices for contract and spot-market power, which shields the sellers from gains and losses and exposes the buyers to these risks.[18]

Another troublesome regulatory issue is that regulatory authorities may have to mandate that risk-avoiding sellers join the pool. It is certain that sellers wanting to avoid risks will support equalized prices. Also, it is certain that they voluntarily would rebate to buyers no more than the full variable costs that are associated with not producing the displaced power when the PoolCo substitutes low-priced spot-market power for high-priced contract power.[19] If the sellers rebated more than this amount to the buyers, they necessarily would rebate portions of their returns on their fixed costs to buyers.[20] No sellers voluntarily put themselves in this

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[18] If the price for spot-market power is lower than the buyer's price for contract power, then the seller receives a gain. However, the seller has to rebate this gain back to the buyer. Therefore, the buyer pays an *ex post* price that is less than the contract price. If the price for the spot-market power is higher than the contract price, then the seller has suffered a loss because the PoolCo charges the seller for the positive difference between the spot-market price and the price of the contract power. In this instance, the seller uses a surcharge to recover the PoolCo assessment from the buyer. Obviously, the buyer is not held harmless from the financial effects of substituting spot-market power for contract power.

[19] William J. Baumol and J. Gregory Sidak, *Toward Competition in Local Telephony* (Cambridge, MA: The MIT Press and Washington D.C.: The American Enterprise Institute for Public Policy Research, 1994.)

[20] To make this point as easily as possible, consider a seller that earns a competitive return on its fixed and variable costs. When the seller does not generate power, its avoided costs are the full variable costs that it does not incur and the return that it does not earn. If the seller was to rebate more than the unincurred variable costs including the return, it necessarily would rebate a portion of its returns to buyers.

situation. If told that their profitability would decline when the PoolCo substituted low-priced spot-market power for high-priced contract power, these sellers simply would not join the pool. Therefore, any rule requiring the sellers to rebate more than their avoided full variable costs has to be supported by a mandatory requirement that the sellers join the pool.

Still another troublesome aspect of a PoolCo is that this regulated company has to perform complex pricing functions in addition to its other responsibilities.[21] Consider what happens when the PoolCo sets up the spot market for electric power. The commodity for this market is power that has not been contracted for by any buyers. Let the PoolCo be responsible for setting the price for this power. Let the price be an hourly price. The hourly prices may be set as follows. Sellers offer hourly prices for uncommitted electric power that are equal to or greater than their marginal costs of producing electric power for that hour. The PoolCo necessarily receives different hourly offered prices for two reasons. Either the sellers' cost functions are different, or they face different demand conditions. In the latter instance, the hourly offered prices include monopoly rents, if these offered prices are higher than the sellers' average costs for these hours. Obviously, not every hourly offered price is accepted by the PoolCo. It rejects offered prices that exceed the highest offered price that is consistent with meeting the PoolCo's expected demand for that hour. The highest accepted offered price is the spot price for that hour of the next day. Obviously, the spot price may be high or low, depending on the demand for uncommitted power. Therefore, sellers with uncommitted power and offered prices below the spot price can do well in the spot market.

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[21] The PoolCo operates the transmission grid in four dimensions. It has to maintain system reliability. It has to balance production with consumption. It has to honor self- nomination arrangements on an hour-to-hour basis that are consistent with the physics and dynamics of transmission grid. It has to facilitate the supply of unbundled transmission services to wholesale or retail customers.

A workable spot market is essential to the success of the PoolCo concept. Consider a PoolCo that is coordinating the following types of bilateral generation contracts. First, it deals with contracts where the sellers and buyers agree to abide by a "contract for differences" rule for addressing the financial effects of substituting spot-market power for contract power. Contracts for differences is a real-time system of rebates and surcharges that is designed to allow the sellers to collect or refund the full difference between spot and contract prices.[22] Hence, spot prices are essential. Second, it deals with contracts where the PoolCo agrees to honor the self-nomination arrangements of the buyers and sellers whenever physically possible to do so. If these arrangements cannot be honored because of transmission limitations, then the buyer pays the spot price for the substitute power to the PoolCo. Meanwhile, the PoolCo pays the contract price to the seller. Therefore, the spot price is essential. If the arrangements cannot be honored because the seller did not produce the power, then the seller pays the PoolCo for the positive difference between the spot and contract prices. The buyer pays the contract price. Hence, the spot price is essential. If the difference between the spot and contract prices is negative, then the buyer pays only the lower spot price. Hence, the spot price is essential.

The PoolCo concept is a controlled type of industry reform that is consistent with vertically disintegrated electric power utilities, while it neatly provides transmission and transmission-access services through a pooling arrangement that captures the economic coordination aspects of a vertically integrated utility. The PoolCo is the only market-making mechanism for the generation market, and consequently, the wholesale and retail customers have no option but to conclude all

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[22] Larry E. Ruff, "Risks and Regulation in Competitive Electricity Markets" Mimeo, presented at the Twenty-first Annual Rate and Regulatory Symposium: Competitive Utility Services and the Changing Functions of Regulation, sponsored by the Kansas Corporation Commission, the Missouri Public Service Commission, the Oklahoma Corporation Commission, the University of Missouri at Columbia, University of Oklahoma, Utah State University, and in cooperation with the University of Missouri Extension Conference Office in St. Louis, Missouri, 15-17 May 1995.

of their business transactions with the PoolCo's assistance. In return for this clearing-house authority, the PoolCo has to ensure the smooth and seamless operation of the transmission grid at the physical and economic levels. It also has to ensure the physical delivery of electric power to the wholesale and retail customers, and whenever possible, it must operate the transmission grid in a manner that provides for the economically efficient transmission of electric power to wholesale and retail customers. Furthermore, it must make the necessary investments to guarantee the reliability and quality of its transmission network. In addition, it must address all of the public health and safety concerns that are associated with the transmission of electric power to the distribution gateways. Finally, the PoolCo must create, maintain, and operate a spot market for electric power.

Local Distribution Companies as Resource Portfolio Managers

The management of a portfolio of energy sources involves rural cooperatives, municipally owned utilities and utility-owned local distribution companies in the act of selecting the best combination of generation services given their needs.[23] In this context, best means minimizing the life-cycle costs of reliable energy systems for their collectives of customers. They can accomplish this objective through the optimal use of competitive procurement practices, targeted demand-side investments, and a mix of short-term and long-term contracts for purchased power. However, the same price information has to be available to all of the three different types of distribution companies, if the aforementioned options are to be used

[23] It is important to note that the vertical disintegration of investor-owned utilities is not necessary to make their distribution companies over into portfolio managers. These utilities may remain fully vertically integrated because the portfolio management function does not stop them from producing electric power using the full range of supply side technologies, purchasing electric power from the full range of contracts, and saving electricity using the full range of demand-side technologies. In addition, the optimal use of this cost-minimization tool requires the vertically integrated utility to consider seriously the benefits and costs of the bevy of competitive sellers.

optimally. Universal price information enables the distribution companies to determine individually the mixes of spot prices, contract prices, and demand-side-management prices that best suit their responsibilities to deliver electric power efficiently to their retail customers.

The word describing this industry reform is cautious because retail customers are not permitted to use the transmission grid directly to lower their costs. They remain wedded to their host local distribution companies. Consequently, this reform deals mostly with changing the procurement activities of distribution companies without significantly altering their responsibilities elsewhere.

Review of Alberta's Industry Reform

Alberta's investor-owned and municipally owned utilities comprise a centrally planned and interconnected system that provides for the generation, transmission and distribution of electric power throughout the province. To eliminate significant rate disparities among the smaller cities in Alberta, the costs of generation and transmission, since 1982, have been averaged province-wide, pursuant to provincial law, by authorizing positive or negative transfer payments to the local distribution companies operating in Alberta.[24]

The existing system seems to have performed well for the majority of Alberta's retail customers. The current province-wide embedded average cost of electric power is less than the per kilowatt-hour cost of new generation. However, it is not clear that the utilities currently comprising the interconnected system will be the least expensive sources in the future. Technological advances driving down the costs of combined-cycle gas turbines, joined with technological advances driving down the costs of exploring for natural gas reserves, may erode the economies of scale typically associated with coal-based plants. Because

[24] Rick Hyndman, et. al., "Restructuring Alberta."

nonregulated companies can gain access to competitive finance markets to obtain the funds that are necessary to build gas turbines, it is prudent for Alberta's government to investigate whether its existing interconnected system has to be repositioned for the oncoming threat of competition.

Analysis of Alberta's Industry Reform

Five features of Alberta's reform effort are analyzed in this section. They are: (1) the Government's prohibition against retail competition, (2) the Government's intention to preserve low prices for retail customers, (3) the Government's desire to limit the displacement of a regulated utility as the service provider, (4) the Government's attempt to manage the entry of nonutility generators into the wholesale market, and (5) the Government's decision to implement open access and comparability.[25] Each of these elements has a strong effect on the fortunes of nonutility generators, regulated utilities, and retail customers. For example, the prohibition against retail competition preserves the close business links between retail customers and regulated utilities. The preservation of low prices for retail customers points to the philosophical bent of Alberta's industry reform, which is that retail customers should not shoulder the financial burden of introducing competition into the wholesale market for electric power. The restricted entry of nonutility generators, in the sense that they only can compete realistically for new wholesale load, prevents the rapid depletion of the utilities' customer bases.

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[25] Alberta Department of Energy, "Enhancing the Alberta Advantage: A comprehensive approach to the electric industry" Mimeo, Calgary, October, 1994.

Prohibition Against Retail Competition

The restriction of competition to the wholesale market means that the ability of retail customers to take direct actions to lower their electricity costs has been curtailed. Consequently, retail customers remain captives of their host utilities. Regardless of their size, load characteristics, and power-supply options, these customers cannot enter into any legal relationships such as bilateral contracts or bilateral trades with nonutility generators or municipally owned utilities.[26] Instead, they must purchase bundled electricity from their host utilities.

Although the prohibition of retail competition prevents any change in the status of retail customers *vis-a-vis* the regulated utility, it does not follow that large-volume retail customers are not able to take any actions that might result in lower retail prices for electric power. First, large-volume customers might threaten to leave the service territories of their host utilities. If these threats are credible in the sense that there are reasonable expectations that these customers profitably could leave their hosts' service territories, then these customers may be able to extract discounts from their host utilities. The host utilities might justify these discounts as actions that are necessary to preserve the economic development of their service territories. Of course, the electric power loads of the threatening customers must be very large indeed for such a justification to carry much water. Alternatively, the host utilities might argue that the discounts are justified to prevent an increase in the prices of electric power for its less-mobile customers. This justification often carries a lot of water when the less-mobile customers are small-volume residential customers.

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[26] Bilateral trading refers to wholesale power that currently is under contract to a local distribution company. The local distribution company does not need the full amount of power that it has under contract, and therefore, it wants to off load this power in some fashion. Bilateral trading allows the local distribution company to sell its excess wholesale power to retail customers. Presumably, the retail customers would pay less than the energy portions of their current rates. However in return for the lower energy costs, the retail customers cannot bypass the distribution facilities of their host utilities.

Second, large-volume customers may threaten to substitute self generation for the electric power that they currently receive from their host utilities. Self generation is the bypass of the utility's electric power system, and therefore, threats to engage in self generation are equivalent to threats to leave the affected service territories. As usual, these threats have to be credible to elicit any responses from the utilities. But if these threats are credible, and if the electric power loads of the retail customers threatening self generation are large enough, then the utilities might offer discounts to prevent these customers from bypassing their systems. Rates that include such discounts are called bypass rates, which typically are justified in the name of preventing rate increases for small-volume residential customers.

Preservation of Low Prices for Everyone

The average embedded costs of electric power generated by Alberta's utilities are lower than the average embedded costs of electric power that is generated by nonutility generators.[27] In addition, the utilities' actual average costs of production are appreciably less than the actual average costs of the nonutility generators.[28] Because Alberta's electricity prices are based on the average costs of production, these observations suggest that the current electricity prices in Alberta may be relatively low as compared to the prices in other Canadian provinces. Not surprisingly, Alberta's government does not want these low prices for everyone to slip away as a result of competition for existing wholesale load. Therefore, in a very real sense, the Government has a very good reason for making it difficult for nonutility generators to compete immediately with regulated utilities for the right to serve this load.

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[27] Alberta Department of Energy, "Enhancing the Alberta Advantage."

[28] Rick Hyndman et. al, "Restructuring Alberta."

The following example shows how competition for existing wholesale load can raise the prices of electric power for the utility's retail customers and remaining wholesale customers. Suppose that an existing utility is the service provider for a municipality in Alberta that owns distribution facilities. Suppose further that nonutility generators can compete for this wholesale load. In addition, suppose that the prices that are offered to this municipality by the nonutility generators are lower than the regulated price that the municipality pays to the regulated utility. Finally, suppose that the utility's marginal cost of production is lower than any of the prices that are offered by the nonutility generators. Under these conditions, the utility would petition Alberta's regulatory authorities for the right to offer a price discount to the municipality in an effort to keep this wholesale customer on its system and to prevent increases in the wholesale or retail rates for other customers on its system.

However, under rate-of-return regulation, a price discount that is justified on the basis of avoiding large rate increases for the remaining customers still results in smaller rate increases for these customers. Therefore, successful competition by nonutility generators for existing wholesale load results in higher prices for the utility's other customers. Obviously, such an outcome is not consistent with the desire of Alberta's government to keep prices low for everyone. Neither is such an outcome consistent with the Government's apparent desire to reform its electric power industry. Few governments and regulatory authorities want to be pointed out to the general public as the cause of increasing prices. No one seriously believes that the road to success in policy making is to foster the expectation of rising prices in the name of improving economic efficiency. Equity considerations simply are too weighty for this strategy.

Capture of Existing Wholesale Load by Nonutility Generators

Alberta's government has made it difficult for nonutility generators to compete for existing wholesale load. This subsection describes why this is so

through the example of how the Alberta government intends to allow its regulated utilities to recover the fixed costs of existing generation. For simplicity, fixed costs are defined as those costs that do not vary in the short run when electricity production is either increased or decreased. Typically, fixed costs are associated with plant and facilities; however, they also describe the salaries of members of top management and some essential staff and production workers.

Fixed costs are found in regulated and unregulated companies. To the extent that regulated industries are more capital intensive than unregulated industries, it would follow that regulated companies are likely to have a higher percentage of fixed costs than unregulated companies. To the extent that there is an incentive to substitute capital for labor in a regulated industry that does not exist in an unregulated industry, it would follow that regulated firms are likely to have more fixed costs than unregulated firms. However, these possibilities are either a fact of production or a speculation about regulation that does not affect the recovery of fixed costs. They simply suggest that the recovery of fixed costs by a regulated company is not a trivial matter.

Typically, fixed costs are recovered by regulated and unregulated companies through a combination of depreciation rates and annual rates of return on investment. Every year, either type of company books a specific amount of money in a depreciation account, and the same amount is subtracted from the original value of the asset. A rate of return on the undepreciated portion of the investment is earned by either firm. This money is reflected in the companies' net income statements. This process continues until the investment is fully depreciated or until the asset becomes obsolete, whichever comes first. If an asset becomes obsolete before it is fully depreciated, then the companies, in principle, should stop earning a rate of return on it.

Regulation makes a difference with respect to the income-producing potential of an obsolete investment that has not been fully depreciated by the regulated firm. Whereas an unregulated company would stop earning a rate of return on an asset

as soon as that asset became obsolete and was replaced, a rate-of-return-regulated company continues to earn a rate of return forever on the undepreciated portion of the obsolete asset. This anomaly arises because the regulated company's depreciation reserve is part of its rate base, and the undepreciated portion of an obsolete asset remains in the depreciation reserve forever. Therefore, assets are never really unaccounted for by a rate-of-return-regulated firm. The company may not be depreciating them anymore, but it continues to earn a rate of return on them as along as they are not fully depreciated.

Alberta's government has decided to modify the preceding cost-recovery anomaly and then apply it to the recovery of the fixed costs of its utilities in the post-reform industry. The modification is that assets that are unused because of public-policy decisions continue to be depreciated and earn a rate of return until they are fully depreciated. Meanwhile, premature economic and technological obsolescence continue to affect the utilities's ratebases and depreciation reserves as they did before. That is, regulated utilities do not fully depreciate these assets, but they continue to earn rates of return on them indefinitely.

Alberta's government has assured the preceding outcomes by proposing a system of reservation payments to the regulated utilities by the transmission administrator and distribution companies for the purpose of securing rights to the utility-owned transmission facilities.[29] These payments are unavoidable in the sense that distribution companies continue to make them even if they purchase all of their electric power from nonutility generators. However, they are avoidable for an individual distribution company in the sense that a single distribution company does not have to pay them if that company leaves Alberta or builds its own transmission network to deliver its wholesale power purchases to its distribution

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[29] The transmission administrator is neither an independent system operator nor a PoolCo as defined in the United States. Instead, it has an affiliate relationship with the utilities. First of all, its staff is drawn from the utilities. Second of all, this staff oversees the operation of plant and equipment that is legally owned and bound to the utilities.

gateway. But, if events like these were to transpire, then the distribution companies that do not leave Alberta, or do not have their own transmission networks, would pick up the slack until they too decided to build their own distribution networks or leave Alberta. In any event, the sum of these reservation payments covers all of the utilities' annual fixed costs of all existing generation, which includes a rate of return on economically and technologically obsolete investments, and depreciation and a rate of return on stranded investments. Obviously then, these payments ensure the recovery of the utilities' existing annual fixed costs, thereby insulating their existing investments from the effects of competition.

Surely, the structure of the reservation payments is a disincentive for many distribution companies to purchase electric power from nonutility generators. However to be fair, this disincentive does not overwhelm every opportunity that a nonutility generator may have to displace the utility as the service provider for wholesale customers. A nonutility generator can displace the utility if its average cost per kilowatt-hour is less than the utility's average variable cost per kilowatt-hour. In this case, the sum of the reservation payment and the nonutility generator's average cost is less than the sum of the reservation payment and the utility's average variable cost. Consequently, distribution companies can lower their costs in some instances by substituting electric power from nonutility generators for electric power that is produced by the utilities.

Although it is possible that a nonutility generator may win out over a utility when it comes to serving existing wholesale load, it is not very probable that such an event will occur under the operating circumstances that are expected to accompany Alberta's industry reform. To see why, suppose that a nonutility generator can earn a competitive rate of return on its investment by selling its electric power at 5 cents per kilowatt-hour. A rational distribution company would substitute electric power from the nonutility generator only if the utility's generation company was producing electric power at a variable cost of above 5 cents per

kilowatt-hour. However, most coal-based generation plants in Alberta have average variable costs of approximately 2 cents per kilowatt-hour.[30]

The emphasis that Alberta's government has placed on the comparison of the average costs of the nonutility generators and the average variable costs of the utilities is consistent with the adoption of an implementation strategy that takes every opportunity to keep existing generation on line. Another aspect of Alberta's implementation strategy that works toward keeping existing generation on line is the rate structure for system-access service. System access is the service that utilities and nonutility generators use to transport their electric power from the site of generation to the distribution gateway. Alberta's industry reform applies two different ratemaking standards for this service, depending on whether the electric power is generated from an existing source or a new source. A postage-stamp ratemaking standard is used for the system-access service that is available for existing generation, while a location-based rate is the ratemaking standard for the system-access service that is available for new generation.[31] To the extent that the distance sensitivity in the transmission rates increases the costs of the nonutility generators relative to the costs of the utilities, the nonutility generators find it more difficult to displace the regulated utilities.

Capture of New Wholesale Load by Nonutility Generators

If nonutility generators are not expected to capture the existing wholesale load that is served currently by utilities, then, if this reform is to be successful, the Alberta government must expect that the nonutility generators can compete effectively for new wholesale load. How reasonable is this expectation? The

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[30] Ibid.

[31] Ibid.

competitive environment that is encountered by nonutility generators when they seek to serve this new load is described to help answer this question.

The first important characteristic of Alberta's competitive environment for the sale of electric power at wholesale prices is that the regulated utilities are not required to divest themselves of any of their assets. Consequently, they continue to be vertically integrated companies with all of the separation of functionalities occurring through the application of cost-allocation techniques. Separation by cost allocations raises the possibility of anticompetitive behavior by these regulated companies, especially if they believe that they have to subsidize their generation services to ward off the competition for new wholesale load that is threatened by the nonutility generators. The second important characteristic is that the utilities and the nonutility generators may have to pay distance-sensitive transmission rates to the transmission administrator when they compete for the right to serve new wholesale load.

In recognition of the fact that the utilities are vertically integrated, it appears that the efficacy of Alberta's reform rests on the assumption that Alberta's regulatory authorities can prevent cross-subsidization, tie-ins, and other anticompetitive practices that may cause utility-owned distribution companies to favor utility-supplied generation services. Assuming this to be the case, the degree of competitiveness of the wholesale market is driven first by the distance sensitivity of the transmission rates, and second by the average costs of the nonutility generators per kilowatt-hour versus the average variable costs of the regulated utility per kilowatt-hour. Several relationships among these parameters are examined to see why this is so.

The first relationship has the regulated utility and a competing nonutility generator paying the same price for transmission service, while the average cost of the nonutility generator is less than the utility's average variable cost. Under these conditions, the utility-owned and municipally owned distribution companies reject the utility's offer to serve their new wholesale electric load, and they accept the

nonutility generator's offer to serve this load. The second relationship has the utility and the nonutility generator paying the same transmission price, while the nonutility generator's average cost exceeds the utility's average variable cost. These conditions imply that the utility serves the new wholesale load.

The third and subsequent relationships are characterized by unequal transmission prices for the utility and the nonutility generator.[32] In the third relationship, the nonutility generator has a competitive advantage in generation, but its price for transmission service is higher than the transmission price that is paid by the utility. These conditions benefit and harm the nonutility generator's ability to compete with the utility. Consequently, it is not clear whether the utility or the nonutility generator will serve the new wholesale load. If the nonutility generator's generation advantage outweighs its transmission disadvantage, then the nonutility generator serves the load. If the nonutility generator cannot overcome its transmission disadvantage, then the utility wins the right to serve the new wholesale load. The fourth relationship depicts a utility that has the competitive advantage in generation and the competitive disadvantage in transmission. The analysis of this relationship is the mirror image of the preceding analysis with the roles of the winners and losers reversed. The fifth relationship describes a utility that has the competitive advantage in generation and distribution. Not surprisingly, the utility serves the new wholesale load. The sixth relationship portrays the nonutility generator as possessing both competitive advantages. Obviously, the nonutility generator gets the nod to serve the new wholesale load.

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[32] Historical development is the reason why these prices may be different. The utility's history might have put it in the position to site its new generation plants closer to the transmission gateway when compared to the plant sites that are available to the nonutility generator. Is there any reason to believe that such a history exists in Alberta? The transmission network has been and will continue to be expanded and maintained by the utilities or its agent. Consequently, the standard state of affairs would seem to be that the utility and a competing nonutility generator could face different prices for transmission service.

Attainment of Open Access and Comparability

Pricing concerns are not the only concerns that occupy the minds and time of the affected parties during industry reform. The structural issues of access and service comparability always seem to accompany any transition of a monopolistic regulated market to competition. In the past, service comparability and access have dominated regulatory proceedings pertaining to the reforms of the telecommunications and natural gas industries. Equal access dominated regulatory proceedings after Judge Greene accepted the Modified Final Judgment and AT&T divested its operating companies. Equal access, loosely defined, is identical services, to the extent practicable, for all long-distance carriers at equal per unit prices for these services. The equal-access qualifier introduces the comparability issue. Access and comparability issues also lie at the heart of the Federal Communications Commission's open network architecture initiative.[33] The deregulation of the price of natural gas at the wellhead and the subsequent decisions by the Federal Energy Regulatory Commission to allow wholesale and retail customers to contract directly with producers for supplies of natural gas combined to generate a series of access issues pertaining to interstate pipelines. These access issues tended to focus on the operational concerns that are associated with balancing natural gas flows, delivering natural gas to specified locations at specified times, storing inventoried natural gas, and reselling natural gas that had to be transported to distant locations. Each of these transmission functions had to be provided on a comparable basis to all direct purchasers of natural gas to ensure the continuation of a competitive market for natural gas.

Transmission issues are at the center of the reform of Alberta's electric power industry. Nonutility generators are the competitors of vertically integrated

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[33] Robert J. Graniere, *Implementation of Open Network Architecture: Development, Tensions, and Strategies* (Columbus, Ohio: The National Regulatory Research Institute, 1989).

utilities. Consequently, nonutility generators need open access and comparable transmission services, if they are to compete effectively with these utilities. Loosely defined, open access means that all nonutility generators are endowed with the capability to connect to the transmission grid in a nondiscriminatory manner. Loosely defined, service comparability means that the transmission service that is provided to the nonutility generators is roughly the same as the transmission service that is provided to the regulated utility. Furthermore, comparability implies that the prices for comparable transmission services are roughly equivalent. These conditions provide assurances that the operation of a competitive wholesale market, which matches the needs of producers and wholesale customers, is not impaired by market power that is traceable to the utility's control over transmission facilities.

Alberta's implementation of open access and service comparability should have only marginal effects on the transmission services that are currently in place to transport electric power. Consider that Alberta's utilities remain vertically integrated, which means that nonstructurally separated, utility-owned generation companies continue to be connected to a transmission grid that is owned by the nonstructurally separated, utility-owned transmission companies, as they were before the reform. Also consider that the operation and maintenance of Alberta's transmission grid is overseen by a utility-dominated transmission administrator that dispatches electric power economically. Consequently, the addition of a new generation site that is owned by a nonutility generator is functionally equivalent to the addition of a newly constructed, utility-owned generation plant. Therefore, the newly constructed generation facilities of the nonutility generators and the utilities can be connected to the transmission grid in an identical fashion, which means that open access and service comparability virtually are assured for nonutility generators as they compete primarily for new wholesale load.

SUMMARY AND CONCLUSIONS

The Alberta government's effort to capture the benefits of lower prices, lower costs, more products and services, and more innovation through industry reform has been conducted very cautiously. It has limited the reform of this industry to changing the operation of the wholesale market. It implicitly has limited the use of bilateral trades to meeting short-term variations in the demand for electric power by wholesale customers. It has decided to retain the vertical integration of the existing regulated utilities, which is a decision that minimizes the administrative and procedural costs of its industry reform. Finally, it has created a regulated transmission administrator that is best described as a utility-dominated staff organization that is responsible for managing and operating the utility-owned transmission grid in conformity with the principles of economic dispatch. This creation represents virtually no change in the way that transmission services currently are offered in Alberta.

Alberta's industry reform addresses the stranded cost issue by instituting reservation payments that are assessed against the transmission administrator and distribution companies. These payments are structured to ensure that the utilities recover all of their annualized fixed costs, including the fixed costs of existing investments that are stranded by competition in the wholesale market. These reservation payments virtually are unavoidable as long as these companies remain in Alberta, and it is very unlikely that they will leave Alberta.

Alberta's government dealt with the transmission issues by instituting the structural reforms of open access and service comparability, and the pricing reform of distance-sensitive transmission rates for new generation. Open access and service comparability for nonutility generators are assured because it is not difficult to connect the nonutility generators and the utilities to the transmission grid in the same manner, as long as they are competing for new wholesale electric loads.

Distance-sensitive rates for transmission services, which are applicable to new generation that usually serves new wholesale load, insert a measure of economic efficiency into Alberta's transmission market. It is well-known that the costs of providing transmission service vary with the distances from the transmission and distribution gateways.

However, the structure of the reservation payments and the structure for the system-access rates conceivably can reduce the competitive forces operating in Alberta's wholesale market for electric power. Reservation payments make it more difficult for a nonutility generator to displace a utility in the area of serving existing wholesale load. Distance-sensitive, system-access rates are apt to make it more difficult for a nonutility generator to serve new wholesale load. Perhaps, these two rate structures exist because Alberta's government is uncertain about the reliability and availability of a large volume of electric power from nonutility generators. In short then, Alberta's industry reform represents the cautious support of competition at the wholesale level.

The actual act of reform always challenges the creativity of reformers. Alberta's government met this challenge. It devised a well-integrated reform for its wholesale market to meet its purposes. The key to its success is the strict adherence to one guiding principle-cautious gradualism. Alberta's government retained most of the existing industrial organization of its electric power industry. For example, existing pooling arrangements are used to transport electric power from the generation sites to the distribution gateways. It did not make it easy for a competing nonutility generator to displace the opposing utility as service provider with respect to existing wholesale loads. Instead, it chose to restrict most of the competition between these different types of companies to new wholesale loads in areas where the regulated utilities do not have excess capacity. Finally, it did not permit Alberta's retail customers to purchase electric power from nonutility generators. Therefore, Alberta's distribution companies continue on as their sole sources of electricity.