Before the New Mexico Public Utility Commission

NMPUC Case No. 2867

Application of Residential Electric Incorporated.

Prefiled Direct Testimony of Michael T. Maloney and Exhibits

Q: Please state your name and address.
A: My name is Michael T. Maloney. I live at 303 Edgewood Avenue, Clemson, South Carolina.

Q: What is your present occupation and educational background?
A: I am a Professor of Economics at Clemson University in South Carolina. I received a Ph.D. in economics from Louisiana State University in 1978. One of my fields of specialization is economic regulation. I came to Clemson University in 1974. I went to Emory University in 1981 and returned to Clemson in 1982. Also, I served as a Senior Financial Economist at the U.S. Securities and Exchange Commission during 1990. My vita is attached as Exhibit 1.

Q. What work have you done in economic regulation and in the electric utility field?


Q. Have you testified before in the matter of electricity restructuring?

A: Yes. I have testified before the Pennsylvania Senate, South Carolina House of Representatives, Louisiana House of Representatives, New Orleans City Council, Mississippi Senate, Mississippi Public Service Commission, and filed testimony before the United States Congress.

Q: Are you solely responsible for the testimony that you are presenting here?
A: Yes. This testimony has been prepared in conjunction with Professors Robert E. McCormick and Raymond D. Sauer, both of Clemson University, who are coauthors with me on other work examining the effects of electricity restructuring. Even so, I am solely responsible for the testimony.

INTRODUCTION

Q. Please summarize the issues your testimony will address regarding retail competition and regulation?

A: My testimony addresses the critical importance of replacing regulation of electricity with retail competition and the benefits which result. As my testimony will demonstrate, retail competition is in the public interest because it will:

1. Enhance public convenience and necessity.
2. Result in electricity rates that are more fair, just and reasonable than those that can be achieved through rate regulation.
3. Further the public interest by the use of competitive market forces.
4. Provide adequate and necessary public services without unnecessary duplication or economic waste.

The time has come to introduce competition into local markets and to enjoy the significant economic gains to be realized from competition. Maintenance of the current pattern of regulation denies the economy and the citizens of New Mexico large and significant gains in welfare. It is in the public interest to allow consumers to choose among competing electricity providers.
Q: Can you summarize the theory underlying your testimony?

A: Yes. Competition is now technically possible in the electric industry. Regulation is no longer necessary nor efficient and burdens the economy with substantial costs. By contrast, competition is efficient and affords the economy substantial gains in welfare. Therefore, it is now time to pass from regulation to competition in the electric power industry.

As was stated in the Federal Energy Regulatory Commission (FERC) Open Access Notice of Proposed Rule Making, “Technological advances in transmission have made possible the economic transmission of electric power over long distances at higher voltages”. These technological changes have made some aspects of electricity regulation unnecessary, and economic theory establishes the superiority of competition over regulation of the electricity industry.

Deregulation of the electric industry should proceed, given that it is feasible, because regulation is inefficient and does not served the public interest. There are several facts that demonstrate this point. For example, there is a regional hodge-podge of prices that defy economic theory and sense; many prices bear little or no relation to the underlying opportunity cost of production. There has been substantial over-investment in plant and capital equipment. There are inefficient price rigidities over the demand cycle.

Furthermore, deregulation of the electric industry should proceed because the gains from competition are substantial and significant. The facts overwhelming support the view that the gains are very large. There will be significant efficiencies created by competition, large price declines for all consumer classes, and significant increases in economic welfare from both static

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1 Promoting Wholesale Competition Through Open Access Non-discriminatory Transmission Services by Public Utilities. Recovery of Stranded Costs by Public Utilities and Transmitting Utilities. Dockets No. RM95-8-000 and 94-7-001, 70 FERC ¶61,357 p. 36 (mimeo) hereafter Open Access NOPR.
and dynamic perspectives.

Q: Why do you believe the current system of regulation can and should be replaced?

A: The regulation of the electricity industry is based on the assumption that each user requires a monopolist to generate or acquire power for delivery. Fortunately, as FERC has recognized by its issuance of FERC Order 888 and 888a, developments in technology and the integrated power grid render unnecessary the public oversight and guaranteed return once associated with investment in generation assets.² There is no longer any natural monopoly in generation of electricity, and competition among electricity generation facilities is now feasible. Technological and regulatory developments at the national level offer the possibility of introducing competition to local markets for electricity.

Given the integrated transmission network, it is now possible for many suppliers to generate and offer to deliver power to final customers. Current methods of regulation in the electric power market are outdated and in need of basic reform. Rate regulation, public oversight in utility investment, and monopoly service have failed to deliver on their promise of providing low cost power at just and reasonable rates to consumers. The existing system of regulation has created substantial underutilized capacity in the integrated power grid. This system creates wasteful redundancy and economic waste that does not serve the public interest, raises prices above competitive levels, and retards economic growth and prosperity.

It is well established in the economics literature that, when possible, open competition among alternative suppliers dominates any alternative in achieving efficient resource allocation.

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and maximum social welfare. Objections to the introduction of competition are self serving and lack merit. In the vast majority of cases where competition is feasible, it is in the public interest, and the market for electricity generation is no exception. Regulatory decisions at the state level are now required to take the final step of providing the benefits of competition to the public.

Q: Has fundamental change in the regulatory system already begun?

A: Yes. As was noted in FERC’s Open Access NOPR, the electric power system in the United States is undergoing major change. An industry regulated by local, state, and federal government for the best part of the past 75 years is switching to competition, at least at the generation stage of production.

“Well in a great while, the confluence of technical change and external factors causes something extraordinary—a revolution of sorts, a technologically driven discontinuity. . .

Advances in technology now (or soon to be available) will allow us to change for the first time in over a century the basic ways we generate, store, transmit, and use electricity, promoting efficiencies, expanded capabilities, and lower costs.”

There is now little doubt that some form of competition will come to the U.S. power market and provide substantial economic gains to the U.S. economy, which serves the public interest. Other countries around the world are also similarly engaged. This is a world wide phenomenon, and the U.S. cannot afford to go slow or remain stagnant.

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3 Open Access NOPR, Introduction, first sentence, page 3(mimeo): “The electric power industry is today an industry in transition.”

Q: Provide a brief overview of recent Federal regulatory events and describe how they impact open access.

A: It is important from the economists’ viewpoint to understand what changes have occurred that make the move to a competitive market possible. My comments are merely meant to show the background that sets the competitive stage. There have been three important Federal regulatory efforts over the past two decades that impact the market for electricity. These are the Public Utility Regulatory Policy Act PURPA (1978), the Energy Policy Act, EPAct, (1992) and the FERC non-discriminatory Open Access Transmission Tariff and related orders.

The most significant consequence of PURPA was to demonstrate that wheeling and competition was possible. The law spawned a new day in electricity production. Two new classes of generators were created, qualified facilities (“QFs”) and small power producers (“SPPs”) that put power on the grid. PURPA has come under attack because of certain state determined features of implementation that allow QFs to sell power at rates considerably above market prices. In spite of these problems, the extensive transactions of power executed under PURPA demonstrate that an independent, integrated power grid is technically feasible and workable. Today there are more than 1000 QFs and SPPs operating under the auspices of PURPA, with a substantial portion of the installed generating capacity in the United States.

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8 Some estimates put this capacity as high as ten percent of total system capacity.
§§211 and 212 of The Energy Policy Act (1992), EPAct, gave the FERC the authority to order, on application by “[a]ny electric utility, Federal power marketing agency or any other person generating electric energy for sale, that any “transmitting utility . . . provide transmission services” to the applicant, so long as the “order meets the requirements of section 212 and otherwise would be in the public interest”.

Orders 888 and 888a however opened the door to wholesale competition in electricity generation and provided the opportunity for the states to open retail competition by requiring that all public utilities file non-discriminatory open access tariffs. Orders 888 and 888a made access to the interstate transmission system open to any Eligible Customer. A more detailed discussion of the Open Access authority of FERC and its relationship to the New Mexico Public Service Commission’s authority to order wheeling is contained in the Application. The purpose of FERC’s Open Access orders is to “prohibit owners and operators of monopoly transmission facilities from denying transmission access, or offering only inferior access, to other power suppliers in order to favor the monopolists' own generation and increase monopoly profits—at the expense of the nation's electricity consumers and the economy as a whole.”

In my opinion, perhaps the most important features of EPAct and Orders 888 and 888a is to demonstrate the technical viability of competitive open access across the integrated power grid. The U.S. Department of Energy and NERC both seem confident that open access will not impair

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9 FERC Order 888a, FERC Stats and Regs ¶ 31,048, p 30,330.

10 Section 1.11 of the Order 888a Pro Forma Open Access Transmission Tariff states in part: “However, with respect to transmission service that the Commission is prohibited from ordering by Section 212(h) of the Federal Power Act, such entity is eligible only if the service is provided pursuant to a state requirement that the Transmission Provider offer the unbundled transmission service . . . ” [italics added]. As defined in Order 888a ¶ 1.11

11 FERC Order 888a, 76 FERC ¶ 61220 page 1 (mimeo).
system reliability and safety.\textsuperscript{12}

\textbf{Q: How did the interconnected power grid develop?}

A: As the monopoly system grew, more and more generating plants were built, connecting ever increasing numbers of end users. At the same time, connections \emph{between} plants and territories came into practice. The walls built around regions began to erode, and they were replaced with connecting transmission lines that effectively built pathways between separate geographic territories. It is apparent that a significant impetus for the passage of the Energy Policy Act of 1992 and the issuance of FERC Orders No. 888 and 888a, was the recognition that the United States now has a national interconnected electric transmission grid that needed to be opened to allow competition in wholesale generation. In fact the Introduction to Order 888a states:

\begin{quote}
The electric utility industry today is not the industry of ten years ago, or even five years ago. While historically it was assumed that local utilities would be the only ones to generate and transmit power for their customers, today there is a broad array of potential competitors to supply power and widespread transmission facilities that can carry power
\end{quote}

\textsuperscript{12} For instance, consult \textit{Reliability Assessment 1996-2005: The Reliability of Bulk Electric Systems in North America}, NERC, October 1996. NERC discusses a number of what it calls “challenges” and issues details of plans to cope with these. For instance, the reports says regarding transmission:

“The bulk transmission system will support reliable operations in the near term (three to five years) provided transmission additions are complete as planned. . . . The determination of available transfer capability must recognize the effects of all simultaneous transfers and parallel path flows and be made on a coordinated, wide-area basis recognizing how the transmission network is actually used.” (p. 20)

The Department of Energy adds:

“It appears that the reliability of the electric system can be maintained as the new structure of the industry evolves.” \textit{Performance Issues for a Changing Electric Power Industry},” DOE-EIA, January 1995, page viii.
Q: Why is a competitive market developing in the electric industry?

A: Based on the studies by FERC it is my opinion that the move to a competitive market in the electric industry is a result of the integration of the electricity transmission grid. Local generators may still serve the proximate community; however, if sufficient transmission capacity is available they can be freely replaced by generation providers farther removed. With this increased interchange of near and far suppliers, the market for electricity generation services becomes increasingly competitive. As transmission access becomes more open, generation suppliers lose traditional natural-monopoly advantages in serving any customer. Hence, the market for electricity generation can be opened to the free rein of competition.

Q: Why does an open power grid contribute to the public convenience?

A: The idea of an open power grid opens the door to new and innovative contracts between buyers and sellers that allow each to design arrangements that best suits its capabilities and needs.

Q: Describe the efficiency and public convenience of an open power grid.

A: Because of the new developments on the electricity front, it matters much less who supplies vast distances.

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13 FERC Order 888a, FERC Stats and Regs ¶ 31,048, p.30,175.

14 For there to be potential competition, there has to be some transmission capacity to bring power in from outside the local service region, but this does not mean that the transmission system has to be able to handle all the power that users desire internally, only that there be competition at the margin. There has to be a real threat of external power, but the power does not actually have to flow in to make competition work.

15 “The key to a competitive bulk power markets is opening up transmission services. Transmission is the vital link between sellers and buyers. To achieve the benefits of robust, competitive bulk power markets, all wholesale buyers and sellers must have equal access to the transmission grid.” Open Access NOPR p. 4 Mimeo.
power to the grid. Indeed any one user could simultaneously employ multiple generators to supply a portion of its load, or alternatively, one generator at one moment and another at a later point.

Q. Can you illustrate how the competitive wholesale market brings positive competitive pressures to prices charged to end-users?

A: Yes. As I mentioned above, competition currently exists in the electric industry at the wholesale level. Wholesale buyers are able to access a competitive market for electricity generation through what is called wholesale wheeling using the Open Access Tariffs that were required by FERC Orders 888 and 888a. While open access to the wholesale market remains unavailable to most end-use customers, many municipal power authorities have had the potential of tapping the benefits of the wholesale market for several years now. Wholesale wheeling has had a dramatic effect in lowering the cost of purchased power to many municipal power authorities, and is yielding significant price reductions to end-users in cities that have solicited competitive bids.\textsuperscript{16} The fact that municipal utilities that are unconstrained by the embedded costs of past investment decisions are able to buy bulk power on the wholesale market and pass substantial savings onto their citizen-customers speaks to the inefficiency and waste of the current system of regulation. The same regulated utilities that sell competitively priced power on the wholesale market, sell power to their retail customers at much higher rates creating waste, economic inefficiency, and inappropriate redistribution of income away from consumers.

\textsuperscript{16} Municipal power authorities own the distribution lines and poles within their cities. They buy power and then resell it to their customers. Municipal customers are typically residential and commercial customers with only a few industrials. The markup that they charge between the wholesale price of purchased power and retail price levied on their customers is determined by the cost of providing distribution services, administrative costs, and the political process acting to minimize these costs and pass the savings on to citizen-consumers.
Q: Are there any actual examples of how competition has created the benefits that you have discussed?

A: A case where this happened is in the City of Bristol, VA. Bristol runs a municipal power authority. Historically, it has purchased its power from the Tennessee Valley Authority (TVA), an entity that has long been known for low power prices. Just recently, Bristol ended its power purchasing arrangement with the TVA and is now preparing to buy its power from Cinergy, an Ohio based investor-owned utility (IOU). Cinergy beat the TVA price in the bidding process for the Bristol account. Similar events are happening all across the country. The price reductions to residential and commercial customers afforded by these competitively induced wholesale price declines is around 20 percent on average.

Q: Are there any other examples of competitive savings to end-users in the electric industry today?

A: Yes. There are several pilot projects in operation around the country that in a variety of ways are allowing end-use customers to meet their electricity demands through competitive sources of supply. The first pilot project to begin operation was that promoted by the Central Illinois Light Company (CILCO). In that project, CILCO reports that residential customers are enjoying savings in the range of 15 to 20 percent off of CILCO’s own rates, which are the lowest of any investor-owned utility in Illinois.

Q. Does the current regime of rate-regulation serve the public interest now and, if so, should it not be continued even if competition is possible?

A. No the current regime of rate-regulation does not serve the public interest now, and therefore
the Commission should carefully consider restructuring the electric industry to allow for retail
competition. The cumulative effect of past regulatory decisions is opposite to the public interest.
Regulatory oversight was meant to prevent imprudent and unwise investment. Regulatory
oversight was designed to deliver low and reasonable prices. Regulation has failed on both counts.
The root cause of failure is in the reliance upon a monopoly service provider in local service
territories.\textsuperscript{17} Despite the best intentions, regulation has failed to serve as an adequate substitute for
the discipline of market competition. Delay or denial of the proposal to create competition in
local electricity markets merely extends the material harm which consumers suffer under the
current system and is against the public interest. Fortunately, it is not difficult to address these
flaws. Introducing competition in local electricity markets will increase the public welfare, and it is
within the power of the Commission to make this possible.

\textbf{Q: In the past, was there an academic basis for regulation of the industry?}

\textbf{A:} Yes. Electric utilities have been regulated in the United States virtually from their inception.\textsuperscript{18}
The economic theory of natural monopoly was the intellectual basis for the regulation of electric
utilities. A natural monopolist is a firm that enjoys falling average cost as it expands output. By
virtue of declining average cost, one firm can produce any given level of output more cheaply
than any other number of firms. This line of argument dictates that the free market will fail.

The theory of natural monopoly argues that as one firm grows to take advantage of

\begin{itemize}
\item \textsuperscript{17} The term “service territories” is not meant to imply \textit{de jure} monopoly service areas but merely \textit{de facto} monopolies. The NMPUC has stated: “...the Commission has no authority to grant a ‘service territory’ per se. To the extent that any prior order purports to grant a ‘service territory’, we hereby interpret such order to grant only a certificate to construct or operate utility plant.” Final Order 2754 In the Matter of the Application by New Mexico Utilities for Authority to Construct and Operate Additional Distribution Facilities.
\end{itemize}
declining average cost, it loses its competitors, and consumers do not reap the rewards of economies of scale. In the theory of natural monopoly, because of the economies of scale (within the firm) and given the limits to the size of the market, one firm can supply the entire output desired more cheaply than several, smaller firms; more than one firm cannot exploit the economies of scale (within the firm).

While the underlying cost of production can be lower with one firm, it does not automatically follow that the price to the consumers is lower. The monopoly power gained by the overwhelming cost advantage allows the monopoly firm to charge a price that is above cost. This creates excess profits and destroys any benefits to the consumer of the lower cost.

The underlying social problem of natural monopoly centers on two opposing facts. If one large firm can produce more cheaply than a set of smaller firms, then the public is served by the gathering of resources under the roof of one seller. However, this collection of resources erases the potential for rivalry, and hence, firms are not motivated to operate efficiently and if there are cost savings these cost savings are not necessarily passed on to the customers because the public is not served by the invisible hand of competition.

Q: How was this underlying problem of natural monopoly dealt with?
A: Regulation of price was the outcome of these opposing forces. Early on, the public interest theory of regulation was developed. In such a regime, regulators control investment and pricing decisions by natural monopoly electric utilities. The public utility regulators attempt to capture the gains of decreasing average cost and prevent the welfare losses of monopoly. In a perfect world, regulators set price equal to average cost. The economy enjoys the benefits of economies of scale, electric utilities are compensated for their costs of production, and something akin to economic
efficiency attains.

However, public utility commissions confronted the nearly impossible task of assessing the true average cost of production and resorted to rate-of-return regulation. Under this system, regulated companies are allowed to make capital investments and charge prices that recover operating costs plus a “fair-rate-of return” on these investments. The outcome is inefficient from virtually any perspective, and no longer serves the public interest.

Q: Have changes in the structure of the electricity market rendered the application of natural monopoly theory obsolete?

A: Yes. The problem of connecting each consumer with a proximate electricity generator has now been effectively erased by the creation, over the past 30 years, of a complex, interconnected power grid. Most consumers today are ultimately linked to many sources of electricity generation in stark contrast to the industry of 75 years ago. The public interest is no longer served by forcing each buyer to purchase generation from a nearby seller when so many competitors are available. More importantly, there is no evidence to suggest that the electricity industry is a natural monopoly now.

INEFFICIENCIES OF REGULATION

Q: Does rate regulation serve the public interest with fair and reasonable prices?

A: No. The reason is because rate-regulation has failed to emulate competition. Many utilities, not having the competitive motivation of the market place, have built too many over-priced facilities and failed to control expenses. Thus, prices paid in one jurisdiction regularly bear no resemblance
to prices in nearby areas. The old system allows sellers to charge prices for power much higher than necessary when compared with power available from external sources on the wholesale market. The old system has created many closed regional markets with a hodge-podge of prices and rates that defy economic logic and destroy the gains from specialization and trade between regions that competition would bring.

**Q: In what ways is the existing regulatory system inefficient?**

**A:** The old system of rate-regulation denies the economic realities of today. It has created inefficient cross-subsidies, economically inefficient production, a failure to control costs and inefficient high prices. Thus, regulation has not provided the proper incentives for producers to minimize costs. It allows firms that make imprudent or over-priced investments to recover their investments when comparably situated competitive firms would have had to suffer the consequences of poor managerial decisions. For instance, rate-regulation does not properly punish firms that build power plants that are too costly to operate or firms that fail to control operating expenses. Furthermore, efficient firms that build cheap plants are not allowed to pass these cost savings on to retail consumers outside their territorial boundaries. Rate-regulation makes the consumer not the producer bear the risk of mistakes in judgement and bad investment decisions. This risk shifting artificially reduces the firm’s cost of capital over stimulating investment and creating idle physical capital. The end result is that the system of rate-regulation does not punish firms that fail to control expenses or fail to prudently invest capital.

**Q: You say that regulation creates incentives to over invest and create idle physical capital in the electricity system. Can you provide additional details?**
A: Yes. Under the old, rate-of-return regulation system, any investment made by a generation firm and approved by the appropriate state regulators generally was deemed prudent at the outset. However, some plants that were given a certificate of convenience and necessity have in certain situations subsequently been determined to be imprudent or not used and useful. State regulatory commissions -- in contrast to the market-place -- have not usually been able to second guess utilities on the question of investments. Moreover, cost-plus regulation does not motivate utilities to seek the lowest cost, best investment but actually has motivated over construction or high cost facilities. Generally, policies that assure an allowed rate-of-return create at least two basic inefficiencies that ultimately are opposite to the interest of consumers.

Q: What are these two basic inefficiencies that harm consumers?
A: Consumers are inefficiently forced to bear the risk of investment, and utilities are motivated to over invest in plant and equipment.

Q: How does the old system handle the risk of investment incorrectly?
A: Under rate-regulation the risk of investment is spread over the wrong people. Consumers bear an inefficient portion of the chance of change caused by any unanticipated event. If a power plant malfunctions, has excessive capital costs, costs too much to operate, is inefficiently operated, or runs below projected costs, all these events feed back to customers in changing rates. Customers are in a uniquely unqualified position to estimate or manage this risk.

Q: Why can consumers not manage this risk appropriately?
A: Since consumers cannot diversify supply in order to diversify this risk, consumers would have
to hedge the risk by purchasing exotic financial securities. Naturally, this ability varies from consumer to consumer and requires some sophistication and expertise, not to mention sufficient financial wealth to enter the appropriate markets. Transactions costs make it difficult and expensive for electricity consumers to hold the appropriate asset portfolio if they are forced to bear this risk unless they have far greater financial wealth than commonly possessed by the majority of rate payers. On the other hand, if all of the risk is concentrated on the production side of the market, investors in utility stocks and bonds can purchase asset portfolios with ease to diminish the impact of a firm specific shock or event. A fully diversified portfolio of stocks and bonds wipes out all of the firm specific risk involved in utility investments. In sum, sophisticated investors with full access to the entire broad array of financial assets are best qualified to bear and manage the risk of variability in the value of utility investments. In general, electricity consumers, particularly residential consumers and small businesses, are not.

**Q:** To help understand how the system of risk bearing under regulation is inefficient, describe how risk would be handled under a competitive regime.

**A:** The risk of changes in electric utility asset values can be efficiently borne by capital investors by holding shares of stocks and bonds in publicly traded investor owned utilities as well as other financial assets. Investors have the access to the financial markets to make the appropriate diversifying investments that reduce the risk of a single investment to the level of the overall market. Moreover, sophisticated capital investors have superior information about the ways to diversify that are, in general, expensive and difficult to communicate to the small electric power user. Efficient risk management dictates that the risk of capital investments be borne by financial market participants because they have access to the technology of diversification. In the modern
theory of finance, one of the purposes of the firm is to manage and distribute risk to the parties
who have a comparative advantage at bearing and managing risk. In this framework financial
assets, stocks and bonds as well as more sophisticated derivatives and futures, are a device for
parsing risk to the parties who are best positioned to bear it.\textsuperscript{19} This process is short-circuited by
the system of rate of return regulation, which mandates that consumers bear the risk of utility
investments.

\textbf{Q: What are the consequences of shifting risks from investors to consumers?}

A: Shifting of risk to consumers results in the cost of capital to the regulated firm being artificially
reduced below the cost of capital to unregulated businesses. As a result, too much capital is
acquired by the regulated industry and too little capital is acquired in unregulated industries.
Economists have long recognized this incentive to over invest.\textsuperscript{20} Consumers have paid for this
capacity in higher rates and prices, and obtained little in return. Regulation creates this
inefficiency, but competition and open access will put that idle capacity to work efficiently and
prevent future inefficient, excess investment.

\textbf{Q: How has this incentive to over invest affected the cost of power to the public?}

A: The result has been high electricity costs. The form of over investment is often subtle. A
nuclear plant costing billions to construct but pennies to operate is constructed in lieu of a set of
smaller coal-fired plants costing far less to build, but relatively more to operate. Under the old,

\textsuperscript{19} For an introduction to this approach see T. E. Copeland and J. F. Weston, \textit{Financial Theory and Corporate Policy},
Reading, MA: Addison-Wesley, 1988; E. Fama and M. Jensen, “Separation of Ownership and Control,” \textit{J. Law and
Economics} 26, (1983): 301-26; or see J. Brickley, C. Smith, and J. Zimmerman, \textit{Managerial Economics and
\textsuperscript{20} See H. Averch and L. Johnson, “Behavior of the Firm under Regulatory Constraint,” \textit{American Economic Review}
allowed-rate-of-return system, the nuclear plant investment may have made financial sense to the
investor, while the coal-fired plants might have been the wise choice for the overall economy.
Moreover, this argument is independent of whether the investment looks good or bad in hindsight.
The incentive of regulation is to over build and over building makes consumers pay higher rates
than they should. This cost to consumers and the economy is substantial.

**Q: What incentive structure would better serve the public interest?**

A: Investors in generation need to feel the direct consequences of their choices. They need to
make more money than the allowed rate of return when they make wise (or even lucky) choices.
And they need to make less, even lose their whole investment, when they make mistakes (or
circumstances turn against them). Efficient investment draws a direct link between choices and
rewards. The old system retards this link and is not efficient; it creates unnecessary duplication
and economic waste, neither of which serves the public interest.

**Q: Why does the existing, old system result in unjust and unreasonable prices?**

A: Because prices are not based on the true, underlying opportunity costs of resources. This is
inefficient, unjust, and unreasonable. When prices are inappropriately tied to the historical costs of
capital, when firms are not pressured by the forces of competition to operate efficiently, and when
new and innovative products and producers are denied access to the market, the resulting prices
and products lose the characteristics that form the normative basis for the free enterprise,
capitalistic system.

**Q: How does one arrive at just and reasonable prices if regulation does not result in**
appropriate pricing?

A: From the point of view of normative economic theory, just and reasonable prices occur when they embody the real, social costs of resources used in production. This means that each unit sold of any good reflects the opportunity cost of all the resources that were employed for its production. Competition between firms guarantees this result in perfect markets. In the case of electricity regulation, however, prices reflect accounting costs and political forces and not the true, underlying opportunity costs of the resources used in production. The just and reasonableness of the prices is lost in the technique used for their computation.

Q: Can you provide examples of where rates are not just or reasonable?

A: Yes. For instance, when the value of capital assets used in production changes, their opportunity cost changes. In a competitive regime, this would lead to price changes for the output. However, this does not happen in a rate regulated market. In the case at hand, technological advance has lowered the value of assets in place. Were the market competitive, output prices would fall to reflect the declining social value of the embedded assets. This results in just and reasonable prices. Under the current regime of rate regulation, electricity sellers are allowed to recover the historical or accounting costs of the capital assets, even though they are worth less either because the assets were over-priced at the time of construction or rendered less valuable by technological advance.

Another of the primary inefficiencies inherent in rate-regulation is the rigidity of price across the natural cycle of the demand for electricity.

Q: What is the nature of the demand for electricity?
A: Electricity is basically a commodity used by residential, commercial, industrial, and other customers to light, heat, cool, power motors and machinery, and so on. Individual demands are summed to create the market demand for power at any moment. There are substitutes for electricity in some applications, and some users can inter-temporally substitute their demands between periods. So while a kilowatt hour is a kilowatt hour to any and all users, people view the services from that power differently.

The demands for power have a strong cyclical component. The demand for electricity varies within any given day, week, month and year. Temperature, time and other factors influence the demand for power causing a considerable variability in the demand for power. While price plays a critical role in the determination of demand, the point here is that demand, price held constant, varies over a broad range of cycles. The exact level of the demand curve for power shifts due to changes in time of day, weather, and other factors.

Q: In a market where demand varies from time to time, is a single, fixed price efficient?
A: In general, no. This is particularly true where there are substantial fixed, capital assets in place to satisfy the peak demand that have no alternative uses in the slack periods. In this situation, price adjustments, high prices in peak situations and lower prices in slack periods, put the fixed capital to use in the off-peak periods. An example would be the lower prices for downtown parking lots late at night or on the weekends.

Q: Do regulated prices vary by an efficient amount over the demand cycle?
A: No. This is not to say that utilities charge the same price for all hours and all seasons. The point is that there is insufficient flexibility in demand pricing to induce enough consumer load
migration to make the most efficient use of the capital invested in generation facilities.

Q: What is the economic problem created by the rigid prices characteristic of regulation?
A: There are actually two problems. First, excessive capital investment takes place to satisfy the demand for peak power, which is inefficiently high since there is no or too little incentive to shift demand to the off-peak period. Second, capital is inefficiently idled during the slack periods. Since there is no alternative use for these assets, its opportunity cost is very low, yet they remain unemployed. On this count, rate regulation has failed to serve the interest of the economy and the public. In addition, the price of electricity does not reflect actual costs, and thus it gives poor information or signals to electricity users.

Q: Is it true that regulated prices adjust to revenue requirements more than the true, underlying social cost of production?
A: Yes. In current practice, prices rise and fall more in concert with revenue overages and shortfalls in past periods. Rates change on an historic or lagged basis, not for opportunity cost-based reasons, due to the methodology of rate making. This accounting cost, catch-up approach denies substantial gains from trade that could exist under a more flexible price regime.

As noted earlier, under rate-regulation, plant capacity has been built to accommodate the highest level of demand. At any other period, there is generating capacity that could be employed if consumers could be induced to purchase it. According to the first law of demand, lower prices will accomplish this objective. Yet under the old system, price is far too inflexible, leaving the capacity inefficiently underutilized during off-peak periods and the economy suffering.
Q: Are there other examples in the history of regulation where capacity has been underutilized?

A: Yes. To draw a comparison, in the days of airline regulation by the CAB, airplane load factors were in the low 50 percent range.\(^{21}\) For instance, the average load factor for the domestic airline industry from 1965 to 1975 (the waning years of regulation) was 52.9%. The average load factor from 1985 to 1995 was 62.1%, the load factor in 1996 was 67.9% and in 1997 was 69.1%.\(^{22}\) This pattern confirms the proposition that regulation results in underutilized capacity. As a rule, airline load factors have increased year-by-year in the post-regulation era.\(^{23}\)

Q: You have indicated that electricity demand fluctuates and is volatile in its nature. In general, is there an inherent inefficiency in markets with volatile demand?

A: Not necessarily. Unemployed resources can sometimes be shifted to other uses or priced in order to increase their use during periods of low demand. A system of competitive open access will price electricity in periods of low demand close to the variable cost of generation and maximize the use of presently underutilized generating capacity.

Q: Is over investment and idle capital the only source of inefficiency in the current scheme of regulation?

A: No. Absent the pressures of competition, firms that fail to put the proper internal organization structure in place will not be directly driven out of business. As a monopolist, the potential for

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\(^{22}\) Air Transport Association of America. 1301 Pennsylvania Avenue, NW, Suite 1100, Washington, DC 20004-1707 USA. Data taken from Website URL: http://www.air-transport.org/data/loadfctr.htm. The differences in load factors in the pre- and post-regulation eras are statistically significant at the 1 percent level of confidence.

\(^{23}\) The average annual increase in the load factor in the era of competition is 0.64.
excess returns can be used to replace operational efficiencies that are forced upon normal, competitive firms. In the parlance of managerial economists, regulated utilities may earn “free cash flow.” In turn, these returns can lead to waste and inefficiency because the firm does not face the rigors of competition.

For instance, if a utility overpays its workers, or buys expensive materials when lower cost materials of equal quality are available, or poorly designs a system that leads to cost overruns, or simply operates inefficiently, the process of regulation allows these costs to be recovered when a similarly situated competitive firm would suffer. Under electricity regulation the consumers do the suffering, and that is neither efficient nor in the public interest.

Q: Can you illustrate the extent to which the inefficiencies of the old system of rate-regulation characterize the electric industry?

A: Yes. In general, the existing pattern of prices and consumption in the U.S. power market is bizarre: Prices depend on historical cost and vary from region to region with little basis in opportunity cost. Capital is valued not for its productive capacity, but instead by its historical cost of installation. Some simple statistics concerning electricity consumption and price illustrate this point.

The average U.S. consumer of electricity buys about 837 kWhs per month. Consumption is larger in states with substantial air conditioning demand. For instance, in Maine, the average residential customer only buys 505 kWhs per month while in South Carolina the figure is more than twice as high 1138. Residential consumption is a comparatively low 529 kWh per month in New Mexico and nearly 80 percent higher in neighboring Arizona. Colorado residential

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consumption is slightly larger than New Mexico at 614 kWhs per month. In New Mexico, the per household consumption is as low as an average of 320 kWh per month in the Northern Rio Arriba Cooperative region due to high prices and low per capita income.

The overall average price across all user groups in the United States is about 6.9 cents per kilowatt hour. However, residential prices range from a state average high of 13.9¢/kWh to a low of 5¢/kWh, Commercial prices range from a state average high of 11.4¢/kWh to a low of 4.5¢/kWh and industrial prices range from an state average high of 9.6¢/kWh to a low of 2.8¢/kWh. Many times prices vary in magnitudes such as this between neighboring utilities.

Monthly electric bills in New Mexico are relatively low because consumption is below average. Consumption is low because prices are high and because incomes are lower than average.

Q: How do New Mexican customers compare to their regional counterparts in terms of electricity consumption and prices?

A: New Mexico electricity consumers are dissimilar from their regional counterparts. For instance, they consume less power at every class of consumer than the residents of Arizona, Colorado, Nevada, and Utah (excepting industrial load) do on average. The industrial load in New Mexico is smaller than the average load in the region and the nation as a whole.

New Mexico has higher prices than all its neighbors but Arizona. In addition, residential prices are higher in New Mexico than both the regional average and the United States taken as a whole. In fact, the average price of power for residential consumers in New Mexico is more than

25 These are average revenues or prices. They are computed by taking the total expenditures in each class and dividing these by the total kWhs consumed in that class. These are not statements of tariffs per se, but actual expenditures and consumption.
The average of the surrounding states is the simple arithmetic mean of the respective states not the weighted average.

Q: Are the existing relatively high prices for electricity in New Mexico a recent or persistent phenomena?

A: They are a relatively long term event. In 1985 prices in New Mexico were 17 higher than the national average for residential consumers, 10 percent higher for commercial customers, and 10 percent higher than the national average for industrial users. Moreover, in 1985 prices in New Mexico were about 14 percent higher for both residential industrial customers and 17 percent higher for commercial users compared to the surrounding states of Arizona, Colorado, Utah, and Texas.\textsuperscript{26}

Q: When did the relatively high prices for New Mexican consumers start to appear?

A: It appears that the escalating prices started in the middle 1970s. The Federal Power Commission reports data on average prices for residential consumers buying 1000 kWhs per month for 1975 and 1980. In 1975 residential prices in New Mexico were slightly higher, 2.5 percent, than the regional average. However, by 1980 they were 23 percent higher, and as we have just observed, they have remained high since.\textsuperscript{27}

Q: Are the prices of electricity homogeneous across the State of New Mexico?

A: No. For residential customers, price is as high as 14.7¢/kWh for customers served by Sierra

\textsuperscript{26} The average of the surrounding states is the simple arithmetic mean of the respective states not the weighted average. \textsuperscript{27} In 1976 the Commission was convinced by PNM that prices were so volatile that it could not afford to wait on rate cases for increases. The Commission put into effect a rate making system for PNM called cost of service indexing. This methodology allowed PNM to merely file on a quarterly basis its costs and required revenue increases. The increases would then go automatically into effect.
Electric Coop Inc, and as low as 5.8¢/kWh for customers served by Southwestern Public Service Co. The ratio of prices for residential customers from lowest to highest is 2.553. These prices vary by far more than can reasonably be justified by the real opportunity cost of the underlying resources. The graph shown in Exhibit 2 illustrates the wide variation in price.

**Q: Are New Mexican consumers financially better or worse able to pay the relatively high prices they face when compared to their regional counterparts?**

**A:** New Mexican consumers have lower incomes than their regional counterparts, and hence are less financially capable of paying the relatively high prices they face. Although New Mexicans pay higher prices than their neighbors, they are significantly poorer. Median household income in New Mexico as reported by the U.S. Census was $25,991 in 1995, the lowest of the four-corners states. This ties New Mexico with Alabama as the third lowest in the United States behind Arkansas and West Virginia. Exhibit 3 reports the Median Household income by states for 1995 and the three-year average over 1992-1995. One quarter of its citizens live in poverty, three times the poverty level in Colorado or Utah, and nearly twice the U.S. average of 13.8 percent. Lower electricity prices on the order of 20 percent to 40 percent can bring significant increases in well being for the poor people of this state.

### THE EFFICIENCIES OF COMPETITION

**Q: Some people are opposed to deregulating the electricity industry in order to promote competition. Does this mean that deregulation might not work?**

**A:** No. Critics of change say the old system works, and “if it’s not broke we shouldn’t fix it.”
That is equivalent to saying that typewriters work, or that the DC-3 is a fine airplane for commercial aviation, or that rotary dial phones are perfectly functional. Of course they work, but that is not the point. Given the option, they are not the choice of most consumers today. So it is with the old system of electricity generation. Sure it works, but it costs too much, wastes resources, and most consumers will promptly switch systems when given the choice. To make matters worse, regulation stifles innovation, creativity, and other entrepreneurial actions that are the engine of change and progress.

Q: Is it your opinion that because of the technical feasibility of competition and failure of the old system of regulation the Public Utility Commission should allow retail competition under its statutory guidelines?

A: Yes. Competition is possible and the old style of regulation has failed. The Public Utility Commission should allow retail competition because doing so satisfies all of the principles and goals of the Commission’s statutory guidelines.

Q: Why does retail competition satisfy the principles and goals of the Public Utility Commission better than the current form of rate regulation?

A: When full retail competition extends to all parts of New Mexico it will cause prices across all

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28 At least two surveys have been performed, one in New Hampshire by The Delahaye Group and Unitil Resources and one performed in 48 states by RKS Research and Consulting in its Seventh Annual National Residential Customer Assessment undertaken on behalf of 23 electric and gas utilities. The NH survey is reported to have determined that when given the option to choose a pilot program, 91% of the customers of the state’s largest utility chose a different power provider and 72% of the customers of all the utilities chose a different supplier. It has been reported that the RKS survey determined that even if competition threatens higher rates, 84% think competition is overdue and 60% think their bills will be lower when they are able to choose among competing suppliers. David J. Reichman, president of RKS, said, "Residential customers are growing more critical of their current electricity supplier, and more eager to switch. When deregulation arrives and these customers have a choice, they will blame their current utility for the decision to switch."
classes of customers in New Mexico to fall by around 25 percent. I have estimated that

competitive price declines will mean savings to residential customers on the order of $92 million

per year. Savings on current electricity expenditures will be the largest to poor people in terms of

their household income. The poorest people in New Mexico will gain purchasing power of over

one percent of their household income due to savings on electricity expenditures. In addition,

competition will bring overall net improvement in the well-being of the citizens of the state

because competition will increase annual gross state product by around $626 million and increase
tax revenues by around $55.7 million per year. The details of the benefits to the state economy are

given later in my testimony.

The forecast competitive price of electricity, discussed below, is clearly more just and

reasonable than the prices that are currently being charged under the rate-of-return regulatory

process for setting the price of electric services. Competitive prices are in the public interest

because they bring with them enormous economic benefits. Retail competition in electricity will

improve the efficiency of the electric power system by using existing resources more fully, thus

avoiding unnecessary duplication. Finally, rivalrous behavior in a competitive market will assure

the necessary supply of electricity to all consumers.

Q: How can retail competition serve the public interest?

A: Competition will bring lower costs to consumers. The industry is moving away from the

assumption that it must operate under monopolistic theories. It is now recognized that the public

interest can best be served in electricity generation, as in most other industries, by competition.29

This Commission has recently stated in its Final Order in NMPUC Case No. 2752, at page 49,


29 See FERC Open Access NOPR and FERC Orders 888 and 888a supra.
that in order to assure that the public convenience and necessity is satisfied, it must assure a viable and vibrant competitive market.

The “public interest” used to be defined by regulators by means of a periodic review of the “prudence” of an investment program and the utility’s expenditures on operations “adequate” to satisfy the “obligation to serve.” Regulators based rates on a level of revenues that covered the utility’s operating expenses and earned the determined “fair” rate of return. Competitive rivalry does its own review of investment programs and expenditures on operating expenses, continuously assessing whether prudent investments and operations will serve customers and simultaneously yield a return sufficient to cover the market-determined, risk-adjusted, required rate of return on the financial investment. The competitive market, using the invisible hand described by Adam Smith two centuries ago, is able to lift the veil that shrouds the judgment of able people in divining these issues. What was necessarily left to the judgment of a few regulators in a more fragile market structure can now be passed to the wisdom of the many in a robust competitive environment. Just as regulation was established to provide a substitute for an open market when the electric industry was considered to have a monopolistic structure, an open market can now replace regulation because of the possibility of competition.

Q: Under the New Mexico Public Utility Act, public utilities have a statutory obligation to furnish adequate, efficient and reasonable service. How will a competitive retail electric market affect this obligation?

A: In New Mexico, there remains the requirement that regulated public utilities “shall furnish adequate, efficient and reasonable service.” In a regime of retail competition, the type or extent of services offered by a utility may change, in large part because a customer may choose among
utilities furnishing energy service in the customer’s locale. The services offered by a utility should be available to all customers in the area served by the utility. For utilities that provide electricity service over the transmission and distribution lines that they do not own, these utilities should be prepared to serve all customers on an equal basis relative to the cost of providing service.

For the transmission and distribution functions of electric power service, retail competition will more precisely specify the obligation to serve as an obligation to connect. The regulatory process will still exist at the distribution and transmission level to ensure that all customers who are now connected to the electric power system will continue to be so. In large measure and for most consumers, this will mean that the local distribution utility will be required to continue to maintain the wires up and down the street and to allow every consumer to tap into this distribution system.

**Q: What is the “distribution utility”?**

A: The distribution utility is the utility that owns or operates the distribution system that connects consumers to the electricity transmission grid over which they receive generation services. In a competitive regime, the distribution utility allows open access to its distribution system to rivaling suppliers of generation services. This access is allowed for a cost-based fee determined by the Commission.

The distribution utility will be required to furnish electric energy to those customers not served by another provider, but where other electricity suppliers are offering service, they too should be required to offer service in a non-discriminatory fashion to all customers who request service and can pay their bill. Also, the distribution utility will be required to maintain the

30 In California these utilities are being referred to as UDCs, i.e. Utility Distribution Companies.
connection of the distribution system to the power transmission grid. However, the distribution utility will no longer have an obligation to build power generating facilities to satisfy the energy demands of those customers. The competitive market will take over this chore.

Q: Traditionally, the Commission has been concerned with policing utilities to make sure that there is no unnecessary duplication of generation facilities. How will competition ensure that there is no unnecessary duplication?

A: Competition can better provide incentives to ensure there is no unnecessary duplication than can regulators. In the old regime, regulators were asked to oversee utility projections of how much generation capacity was necessary to serve the public interest. They were asked to protect against unnecessary duplication and they were asked to gauge whether the utility’s expenditures on operations were prudent and necessary, based largely on the reasonableness of the projections at the time they were made rather than subsequent actual needs.

Under competition, the market will decide. Individual investors acting alone and in concert with others will make these choices. If the market price of electricity at the generator is in excess of the cost of production or if the cost of production is in excess of what a more efficient generation facility or a more efficient operator could provide, i.e., if generation facilities are receiving excess returns or are not efficient or not being operated efficiently, then new investment will be undertaken. If the market price is insufficient to cover the riskiness of investment in generation, then there will be no new investment until the market-determined price increases. If competitors feel that extra generation capacity is necessary to create alternative sources of supply so that existing generation owners are forced to market their power at competitive rates, then this extra generation capacity is not inherently duplicative. The financial market will assess risk and
return, and make a determination of prudence and necessity.

Q. Under regulation, has the requirement to serve been interpreted by utilities as a mandate to own most of the assets necessary to provide service to customers?

A: Yes. Under regulation, electric utilities have tended to own most or all of the productive assets. The investor-owned utilities are fully integrated enterprises that usually generate, transmit, and distribute electricity. Rural distribution cooperatives and municipal power authorities sometimes deviate from this rule, but even in the case of these utilities there is an observed tendency for these enterprises to expand and integrate into all three lines of business. Distribution cooperatives have joined together to form generation and transmission (G&T) affiliates. Municipals have purchased their own share in generation facilities and leased the lines to transmit this power. Furthermore, the tendency among the IOUs has been to be independently self-sufficient in owning the capacity to generate for the geographic areas they serve. Indeed, the regulated utility motto of an “obligation to serve” has been interpreted to mean an obligation to own the facilities deemed necessary to supply all of the electricity demanded by the end-users in each system.

Q: Does the change caused by competition in the utilities’ traditional decisions to control generation have any effect on the efficient organization of the industry?

A: The efficiency of competition will guarantee adequate service and it will do so under much more efficient circumstances and conditions. No longer will customers be shackled with high prices because of cost overruns. Entrepreneurs who correctly forecast the need for generation capacity and efficiently construct and operate it will receive the rewards of positive profits. Firms
that fail on any of these margins will suffer losses. Regardless of what the price of power is in the future, there will be no more hand wringing by regulators or consumers over whether the price of electric energy is equal to its true cost of production. Everyone will know that whatever the price of power, it is being produced as cheaply as possible. The profit motive will exploit any potential cost saving. That is the assurance that competition brings to the electricity market.

Q: What about the shorter term impact on the generation capacity already built by utilities based on past regulatory economic incentives?

A: In the shorter term, there currently exists a significant amount of underutilized generation capacity. This capacity will have a long life (barring unforeseen, cost-reducing technological advances in generation design). The existing capacity is fairly evenly spread over the entire system. Hence, for the most part, each consumer will continue to receive power from the generation sources now sending that power. At least for the immediate future, retail competition will bring about a financial restructuring of the industry, but not a physical restructuring: the same generating units that are currently being operated likely will continue to operate.

Q: Explain more fully how the Commission can institute retail competition in the State of New Mexico.

A: The Commission can create a system of retail competition by allowing all utilities certified to operate within the state to compete in supplying generation and other utility services to any customer within the state by means of open access to local distribution systems, connecting each customer to the integrated power grid. Access to the distribution system of one utility by another utility is an action at the state level that parallels the open access to the transmission system of one
utility by another, as mandated at the federal level.

Q: Can utilities prevent access to retail customers within a utility’s service territory by claiming that such access results in unnecessary duplication?

A: No. Access to any electricity customer by opening the distribution system of all utilities to all other utilities results in greater efficiencies, not unnecessary duplication. As cited earlier, the NMPUC has stated that geographic service areas traditionally supplied by particular utilities are not exclusive, and the use of existing facilities rather than building duplicate distribution systems prevents uneconomic waste. Utilities must acquire a certificate of convenience and necessity in order to build new transmission and distribution facilities, and in terms of connecting to the electricity transmission and distribution system, it ordinarily makes sense to have only one set of facilities where possible. However, this *(de-facto)* exclusive nature of the connection service does not extend to the energy supply service. Competing utilities can offer customers choices in supply, pricing and services and therefore are in the public interest.

Q: Can the Commission be sure that retail competition will avoid economic waste and unnecessary duplication of facilities?

A: Yes. This is the object of retail competition. Retail competition can be achieved by allowing utilities to use each other’s distribution systems to rival for customers in providing electric generation services. Competitive generation sources are available through the integrated transmission grid. Competition will enhance the efficiency of generation, transmission, and distribution resources available to consumers throughout the state.

Rather than creating economic waste and unnecessary duplication of facilities, retail
competition will more fully employ existing generation capacity throughout the state and tap
underutilized capacity in generation facilities, thereby avoiding unnecessary duplication of these
facilities within the state. Retail competition will lower prices. Lower prices will induce additional
consumption of electricity. Increased consumption properly priced will mean that the existing
transmission and distribution facilities will be more fully employed, which also reduces waste.

Retail competition by means of open access to the local distribution system will bring the
benefits of lower prices and more efficient utilization of the generation services of the industry to
each and every consumer of electricity. While the Commission must maintain a watchful eye to
ensure that free and open competition is not thwarted by monopolistic barriers to entry, the
benefits of competition are so great that the task is well worth the reward to the public.

THE ORGANIZATION OF THE COMPETITIVE MARKET

Q: How do you expect retail competition to work as a practical matter in New Mexico?
A: The institutional structure of retail competition can be put in place by allowing full open access
to all intrastate transmission and distribution lines, i.e. any transmission or distribution not
affected by Order 888 and 888a. Any utility should be allowed to serve any customer in the state
by using the existing transmission and distribution system.

Q: How might competitors behave in such a system with open access?
A: Consider what will happen if a new utility, call it Lite Switch, certificated by the New Mexico
Public Utility Commission, solicits homeowners to sign up with it as opposed to the distribution
utility, say Public Service Company of New Mexico (PNM) by offering to supply these
Lite Switch signs contracts with consumers to supply them with electricity and for the consumer there is no difference between electricity supplied by Lite Switch and PNM. However, from the supply side, Lite Switch may be much different from PNM. Lite Switch may own no generation, transmission, or distribution facilities. It serves its customers by buying these services from other utilities.

To the extent Lite Switch does not own generation facilities, it buys electricity generation services in the wholesale power market from one or more of the existing generation companies. The power is purchased by contract so that the purchased generation matches the consumption pattern (Load Profile) of the subscribers that Lite Switch has put together. Similarly, Lite Switch need not install a new, duplicate distribution system. Rather it uses the existing lines, poles, and transformers that have always connected the residential customers to the transmission system and from there to generation sources. Utilities will compete for customers by using the physical facilities of each other. Competition will force utilities to put together the most cost effective package of physical facilities and other services in order to offer the consumer the best service at the lowest price.

**Q: How will this process of retail competition affect the relationship between the electricity customer and the utility?**

A: From the customer’s perspective, retail competition of this sort differs in an important dimension from the existing regime. The way the market is organized under rate regulation, the customer has no choice. The consumer is locked to one utility because there is only one physical connection between the consumer and the electricity system, and there is only one utility offering
service across this connection. The absence of choice affects the consumer broadly in two ways: It
limits the type of service that the consumer is offered, and it allows the utility to force the
consumer to bear some of the business risk that would be borne by the company and its financial
investors in a competitive environment.

**Q: In what way can competition broaden the type of service the consumer is offered?**

A: For example, consider how competition will change the relationship between the utility and the
consumer in terms of the bill. In the current market, the customer gets a bill for electricity. There
may be some choice of the type of service offered to the customer, but commonly the consumer is
pigeon-holed into one classification outside of the consumer’s discretion. The consumer is billed,
and the bottom line is that the customer pays the charges that the regulated utility is allowed to
impose by authority of the Commission. The customer has no recourse but to pay the bill (or have
service disconnected) nor any bargaining ability prior to connecting to the electric utility.

In retail competition, the customer chooses among rival utilities that offer different rates
and services prior to subscribing to the service of one or the other. The hypothetical company Lite
Switch can offer any kind of deal that it likes. For instance, Lite Switch can offer a flat rate per
kilowatt hour of electricity usage or it can offer a fixed fee for as much or as little power as the
customer wants much as local telephone companies do for local calls. If Lite Switch offers a flat
kWh charge, then the customer’s bill is based on this kWh charge times the total kilowatt hours of
consumption by the consumer for the month. If Lite Switch offers a fixed fee for any or all
consumption, then the customer is charged this amount regardless of the level of consumption.
The bill may not even note the total kilowatt hours of usage. Competition will cause utilities to
offer customers many types of service and many types of billing.
While a flat fee for unlimited kWh consumption may not be a profitable pricing strategy, the fact is that competitors in a free market have the right to try any pricing scheme they wish and consumers have the right to choose among the pricing plans of rivaling vendors. The market will sort out what works and does not work.

Another example of alternative pricing plans that is likely to be very prevalent is the choice between guaranteed prices and prices that are linked to a fuel adjustment index. Today consumers are asked to pay prices that change based on the fuel costs of the utility. In the competitive market these kinds of pricing plans may persist. However, alternative price schedules could be offered to the consumer where the consumer pays a set rate regardless of what happens to the fuel cost of the supplier.

**Q: What benefits can customers receive without having traditional regulatory protections that control the utilities’ pricing decisions?**

**A:** Customers who value price stability will be able to contract for price stability, while others who are willing to accept price fluctuations can choose to bear this risk. It is part of the public convenience and necessity that customers be protected from the risk of rate fluctuations if that is their wish. One of the benefits of retail competition in the electricity market is that this principle of consumer interest can be expressly served for those customers who desire it. Competition will work in the electric industry just as in nearly all of the other industries in the economy.

**Q: Does this mean that competition can offer consumers a choice in terms of the degree of risk of price changes that they can bear as, for instance, was not the case in the recent price fluctuations in natural gas?**
A: This is precisely what competition can do. In the recent natural gas experience in New Mexico, in the absence of competition, consumers were placed in a position to suffer the consequences of the risk choice of the utility. They had no choice. PNM decided to buy natural gas nearly exclusively in the spot market and risk the possibility of random price increases through the winter. Consumers were exclusively tied to this decision by PNM. If a system of competition had been in place, rivaling utilities could have offered consumers a choice of a guaranteed price for natural gas throughout the entire season, or the option of paying the current spot price, which can vary either up or down through the year. Competition in electricity will provide similar flexibility and choice in electricity price programs.

Q: Does the classical approach to rate regulation stifle innovation and create a one-size fits all approach to utility products and services?

A: Yes. One of the abiding conclusions of economic research holds that entrepreneurs bring new and innovative products to the marketplace. According to this argument, the risk taker, the entrepreneur, is the engine of change and the servant of the public interest. “It is certain, however, that companies can be winners if they provide kilowatt-hours in the flavors that customers want.” It is difficult to predict the exact ways that creative and innovative sellers of power will divine to offer service to willing customers. However, examination of other service markets reveals that the breadth of options is far greater than currently available under incentive-stifling

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32 P. Hanser, J. Wharton, and P. Fox-Penner, “Real Time Pricing—Restructuring’s Big Bang?” *Public Utilities Fortnightly* (March 1, 1997):29. “There are several popular contracts, which differ based on the following variables: the portion of the year bundled; the number of interruptible features; a use-demand charge; and how the price and quantity risk is parcelled out between the parties.” They go on to say, “future restructured U.S. power markets will likely offer similar risk-management alternatives.” (p. 29).
regulation.

Since electricity customers vary so much in their demand for power, some must maintain service at virtually any cost while others can easily shift certain types of consumption over time (e.g. water heating, air conditioning, water pumping, milling), the current pattern of service options denies significant improvements in consumer welfare that custom contracting, made available by competition and consumer choice, would surely offer.

Q: Will competition change other aspects of the relationship between the consumer and the utility concerning business risk?

A: Yes. In retail competition the utility bears the risk that the fees billed to the customer cover the cost of delivering power.\(^3\)\(^3\) For instance, if the utility contracts with the consumer to charge only a fixed fee for any and all consumption, then the utility is at risk if the consumer uses an unusually large amount of electricity. Contrast this to the current regime. As it is now, if the revenues received from consumers are insufficient to cover costs, the utility petitions the Commission to allow it to increase revenues to make up the shortfall. In addition, many utilities with fuel and purchased power adjustment clauses are able to automatically pass through to customers the full price of fuel or purchased power, thus placing the full risks of decisions regarding commodity purchases on the customer. In competition, the customer is out of the loop. If the revenues collected by Lite Switch fail to cover its costs, then Lite Switch’s financial investors must make up the difference.\(^3\)\(^4\)

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\(^3\) Costs include generation, transmission, distribution fees and charges paid to service providers across the electricity system, and its own customer service, sales, overhead, and profit. On the flip side, if the prices charged by the competitive, generation supplying utility are too high, rivals will enter the market and offer lower prices.

\(^4\) Critics of retail competition express concern that this process cannot work. They claim that in order to induce companies to supply electricity to consumers, a process must exist whereby shortfalls between revenues and costs are charged back to the consumer. True this is the way that it has always been in the electric industry, but consider
Retail competition allows for customer choice, and with choice comes an insulation from the risk of bad managerial decisions. If Lite Switch signs customers to a contract that is not viable, it goes out of business and its customers simply switch to another service provider as, for example, they presently do on a frequent basis with retail suppliers of clothing and groceries.

Q: You have testified that retail competition allows the expanded use of the physical assets in place in the industry, expands the choices available to consumers, and changes the relationship between customers and the utility. By these shifts in the organization of the industry, does retail competition improve efficiency?

A: Yes. Retail competition forces the generation supplying utility to be the residual claimant to the risks and rewards of the market. The generation supplying utility signs up a customer to a specific deal, whatever the terms. It is then that utility’s problem to make the deal work. No doubt some utilities will prosper while others fail, just as is the case for business in all other industries. However, making the utility residual claimant to the business decision of setting the price to serve the customer creates a major efficiency that the existing regulatory system lacks.

Q: How does making the utility responsible for its pricing decisions improve efficiency in the industry over that of the existing regulatory system?

A: First, because the generation supplying utility is residual claimant to the pricing decision, the utility is forced to be entrepreneurial in this dimension. Innovative ideas about how to serve the customer will survive in the market place. Advanced metering and special services will be attractive to some, but not all consumers. For the ones who are interested in these features and how bizarre such a scheme would sound if it were applied to restaurants. What would consumers think if they were at risk to future charges for meals consumed in the past when the restaurant experienced cost overruns?
options, entrepreneurial utilities will make them available. Individuals who are willing to install devices to monitor and manage their consumption throughout the system load cycle will be rewarded for doing so. Customers who wish to buy bundled services of energy (electricity as well as gas), communications, and home security will receive these in a package. Some services may be unbundled. For instance, competing utilities may install separate electricity lines and meters just to service extra large water heaters that only draw current at night when power is relatively cheap.

In addition to the entrepreneurial ability to imagine the various services that individuals may fancy, a second feature of the residual-claims nature of retail competition in electricity is that the prices charged for these various programs and services will be driven by competitive rivalry. It is an impossible task to ask regulatory commissions to determine the “fair” and correct price to be charged for special services. How much is it worth for a residence to allow its air conditioner to be controlled by the energy supplier? This is a marginal valuation problem that can only be handled by the invisible hand of the competitive market.

Finally, competition creates efficiency because it punishes bad managerial decisions and rewards good ones. Competition will strain every ounce of fat out of cost. Expenditures on operations and generation plant will be forced to pass the true market test, that is, whether they can be recovered when consumers are not captive.

**Q: What prevents a utility from reaping “too large” a reward for its successful decision-making in setting prices in the competitive market?**

**A: An entrepreneurial utility that finds a way to link the right amount of end-user load control with marketing programs to other types of users may be able to make a handsome profit. In the search for this profit, the utility will seek to pay the true marginal value for load control to the**
residential customer who gives up discretion. Surely sometimes it will be too much and at other times too little, but the market, by the process of residual claims to the profits from pricing strategy will weed out the mistakes and clone the successes. In cloning the successes, the competitive market will drive down the profit enjoyed by competitors until they make only the market return. Hence, the fair, just, and reasonable set of prices across the infinite spectrum of possible services will be the central tendency.

Q: How does competition affect price differences between customer classes?

A: Competition will not allow for subsidies between customer classes. The reason is straightforward. Competition will force firms to price services at cost.

Q: If there are subsidies from one class of user to another, will competition allow these to persist?

A: No, with respect to the unregulated portions of utility services. If prices paid by one class of consumer are being subsidized by another, then competition will not allow this to continue. If there are cross subsidies in the current, regulated prices, competition will expunge these along with any price discrimination in all components of prices opened up to competition. However, competition will address unregulated components of service; in those areas that remain regulated, subsidies will in all likelihood continue.

Q: Will allowing the market to dictate prices result in higher costs to the small residential and commercial customers?

A: Regulated prices exceed the cost of residential and commercial service by a large margin. This
difference will not stand in competition, and small customer prices as well as the prices paid by
large users will fall.

Q: If competition will purge any existing cross subsidies, how can competition cause prices
to fall for all customers?

A: The reason that prices can fall for all customer classes is because current prices regardless of
any cross subsidies are higher than the cost of providing service for each customer class. Price
differentials that are not based on cost may currently exist between customer classes. But over
and above this, the total cost of providing service is less than the current revenues that are being
obtained. Because the current price differentials between customer classes result in total revenues
that are greater than total costs, competition can make prices for all groups fall even though they
may fall by different amounts.

FORECASTING THE COMPETITIVE RETAIL PRICE

Q: Based on your analysis of the way that retail competition will work, can you make any
forecast of what the effects of retail competition will be on electricity prices in New Mexico?

A: Yes. The national study cited earlier predicted price declines in the near term on the order of
25 percent and up to 43 percent in the longer term. The various features of the electric industry in
New Mexico are very similar to the nation at large. Average prices in New Mexico are somewhat
higher than the both national and regional prices, so I expect New Mexico prices to fall by as
much or more than the national average.

However, in analyzing an individual state it is possible to be more precise. To do this, I
estimate the system average price that a competitive utility will be able to offer its customers by estimating the kilowatt-hour cost of transmission and distribution for each transmission and distribution service provider and then adding to this the competitive wholesale price of power. I do this for all the investor-owned utilities and cooperatives in the state for which data are available. This procedure gives a forecast of the average revenue that would be collected from all consumers in a competitive market. Forecasted competitive average revenue can then be compared to current average revenue and the savings available from competition are revealed.

**Q: How can you estimate the cost of transmission and distribution that a competing utility will have to pay for open access rights to the transmission and distribution facilities of another utility?**

**A:** This is a process called unbundling. The two regulatory authorities, the FERC and the New Mexico Public Utility Commission, will set fees for transmission and distribution based on the costs incurred for providing these services. In setting these fees, the utility providing the service is allowed to recover its operating costs, its capital investment, and a fair return on its investment. In both cases, the fees that the regulatory agencies allow are intended to foster competition by offering all competitors the same advantage in serving customers and so that all customers pay a price that reflects the opportunity cost that they impose on the system. In this sense, the fees are said to be nondiscriminatory.

At all events, the fees set by the regulatory agencies should follow the best principles of rate regulation. Most importantly, the fees collected should not exceed the cost of providing the service. Based on this principle, I can estimate the cost of transmission and distribution by examining the expenditures currently being made by the utilities in providing these services. Data
on expenditures by the investor-owned utilities operating in the state are available from the filings that they make to the FERC. This is called Form 1 data. For the rural cooperatives, I have data from the filings that they make to the Rural Utilities Service.

**Q: How do you use current expenditures by existing utilities to estimate the cost of transmission and distribution?**

A: Current expenditures by the existing utilities are broken into component classifications of generation, transmission, and distribution. Overhead costs are allocated across these functional categories. Then the costs can be expressed in per kilowatt hour terms.

**Q: When you examine the Form 1 data for the investor-owned utilities, how do you break the expenditures into function categories of generation, transmission, and distribution?**

A: I look at the reported data on the historical cost of physical plant currently in service (undepreciated cost of physical capital) and the accumulated depreciation on this plant. Undepreciated plant is broken into categories of nuclear fuel, intangible plant, steam generation plant, nuclear generation plant, hydraulic generation plant, other generation plant, transmission facilities, distribution facilities, and general plant. Data on accumulated depreciation includes steam generation, nuclear fuel, nuclear generation, conventional hydro generation, pump-storage generation, other generation, transmission, distribution, and general plant. Other balance sheet items include current assets and liabilities, and deferred debits and credits.

Income statement items include current depreciation on steam generation, nuclear generation, conventional and pump-storage hydraulic generation, and other generation plant, transmission and distribution facilities, and intangible, general, and common plant. Operation
maintenance expenses are given for power production (which includes purchased power, system
control, and load dispatch expenses in addition to expenses for the operation of owned generation
facilities), transmission, distribution, customer accounts, customer service and information, sales,
administration, and general. Taxes allocated to electricity are broken out.

Form 1 data also includes information on the cost of capital. The short-term interest rate
that the company is paying on construction in progress is a measure of the short-term interest rate
that company faces in general. The interest rate on long term debt, the rate paid on preferred
stock, and the allowed rate of return on equity are listed. The capital structure of the firm, that is,
the percentages of capitalization in long-term debt, preferred stock, and common equity is given.

These data are sorted in the following fashion. Functionally identified direct and indirect
expenses are separated into each functional category. Direct and indirect expenses include
operation and maintenance, depreciation, and the return on the net capital stock. Return on the
net capital stock is the weighted cost of capital times the difference between undepreciated
historical cost of physical plant and the accumulated provision for depreciation.

Operation and maintenance expenses are broken into the categories of generation,
transmission, and distribution. In particular for generation, operation and maintenance expenses
are the total power production expenses including purchased power, system control, load dispatch
and miscellaneous. In particular for distribution, operation and maintenance expenses include
expenditures in the category of customer accounts, customer service and information, and sales.

Overhead costs include administration and general operation and maintenance expenses,
depreciation expenses for intangible, general, and common plant, taxes, and the cost of working
capital and intangible, general and common plant. These costs must be distributed across the
functional categories. Also, net deferred charges must be distributed. The cost of working capital
is the short-term interest rate times the difference between current assets and current liabilities.

The return on intangible, general, and common plant is the weighted cost of capital times the sum of the net depreciated amount of these. Deferred charges times the cost of capital are distributed across the functional categories.

The overhead items associated with capital (depreciation, return on investment, and net deferred charges) are distributed based on the relative amount of net plant in generation, transmission, and distribution compared to total net plant in generation, transmission, and distribution. Operation and maintenance overhead is distributed based on the generation, transmission, and distribution shares of generation, transmission, and distribution operation and maintenance expenses. Taxes are distributed based on the share of each function category to the total classified direct and indirect cost.

Q: Is it your opinion that the costs of distribution and transmission service that you have estimated should be the basis of the fees allowed by the New Mexico Public Utility Commission for the services that will continue to be regulated?

A: No. These are rough estimates of costs and are only used here to derive the forecast of the average prices of electric service in a competitive regime. These cost estimates are approximate system-wide averages and do not capture important differences in the costs of different types of transactions of electric service passing through these systems. For instance, some customers require a higher standard of reliability than others and should be appropriately charged for this.

Even so, the methodology used here is a good starting place for the Commission to use in developing unbundled open-access tariffs. The Commission should then go further and set the regulated fees for transmission and distribution services should be set based on a full cost of
service study that investigates the many issues of unbundling, including the proper allocation of
the cost of transmission and distribution across customer classes and among customers within
each class so that competitive access fees are fair and nondiscriminatory.

One important issue that I have ignored in the estimates presented here which no doubt
biases these estimated open-access charges up is the proper rate of return to be allowed on capital
invested in transmission and distribution, calculated separately from generation. I worked through
this issue elsewhere and hope that the Commission will consider those arguments when the time
comes to make a determination of the open-access tariffs.35

Q: When you break up utility expenditures according to your methodology what do you
find?

A: El Paso Electric Company (EPE) has estimated system-wide transmission and distribution
costs of 1.35¢/kWh. This is total cost allocated to transmission and distribution divided by total
kilowatt-hours delivered across the system. This cost per kWh for PNM is estimated to be 1.46¢;
for Southwestern Public Service (SPS), .76¢; and Texas New-Mexico Power (TNP), 1.77¢.

Q: You said that you have data for the rural electric cooperatives. Are you able to estimate
the cost of transmission and distribution for service provided by these utilities?

A: Yes. I analyzed the Rural Utilities Service (RUS) data for the Plains Electric Generation and
Transmission Cooperative. In fashion very similar to the method employed for the investor-owned
utilities, the direct and indirect expenses that are categorized as generation versus
transmission/distribution related can be separated. The overhead expenses are then parsed out

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35 See my article, "The Wires Charge: Risk and Rates for the Regulated Distributor," with Robert E. McCormick and
based on the relative shares of classified direct and indirect expenses.

Overhead expenses include taxes, depreciation of general plant, interest expenses, general and administration operation and maintenance expenses, and other deductions. Taxes, depreciation of general plant, and interest expenses are assumed to be most related to physical plant and parsed to generation versus transmission on the basis of the relative amount of net physical plant classified to each of these functional categories. General, administration, and other expenses are put into generation versus transmission on the basis of total classified direct and indirect expenses.

Expenses for the year 1995 are categorized in this fashion and divided by total net energy delivered. This shows the estimated kWh cost of transmission and distribution on the Plains system to be .77¢/kWh.

Q: Are you able to extend this methodology to the rural electric distribution cooperatives?
A: Yes. Data for the distribution cooperatives is also available from RUS. Data Sources include the 1995 Statistical Report and Rural Electric Borrowers RUS Form 7 Filings by each distribution cooperative.

Costs are allocated by functions. Costs from RUS Form 7 were allocated to four groups: overhead, distribution, transmission, and purchased power. Net plant is classified as transmission, distribution, and general. The total amount of depreciation and interest is allocated based on the relative amount of net plant in each category. Overhead costs include sales expense, administration and general expenses, taxes, and the share of depreciation and interest allocated to general plant. Direct distribution costs include distribution O & M, customer accounts and service, and the share of depreciation and interest allocated to distribution plant. Direct
transmission costs include transmission expenses and the share of depreciation and interest allocated to transmission plant. Finally, the cost of purchased power is listed separately.

Overhead is then allocated to the distribution and transmission functions based on the ratio of direct distribution cost to direct distribution plus direct transmission costs and the ratio of direct transmission cost to this same sum. All overhead is allocated to distribution and transmission.\footnote{I have no Form 7s for Southwestern and Springer, and thus have no data on net plant for them. Averages across the other coops were used to allocate depreciation and interest for these two cooperatives. The statistical report has the other relevant information.}

System average transmission and distribution costs are found by dividing by total kilowatt-hours delivered over the system.

Q: Now that you have calculated the fully allocated costs by functional category, how can you use these estimated costs to make price projections?

A: In order to forecast competitive price, it is necessary to have a forecast of the wholesale price of generation. This wholesale price forecast is our estimate of the generation component of delivered electricity price that retail customers will pay. In other words, in a competitive environment, competing utilities will be forced to cut price to final customers until the delivered price reflects the wholesale price of generation regardless of what their own cost of generation is.

In order to forecast the delivered price, I add estimated transmission and distribution costs to the wholesale generation price.

There are a number of sources that give us estimates of what the wholesale price of electric energy will be under retail competition in New Mexico. One is the Palo Verde market. Dow Jones makes a market for wholesale power delivered to the Palo Verde substation. Trades
of power on this market are reported daily in the *Wall Street Journal*. I collected data on these exchanges from August 1996 through February 1997. The average off-peak price of firm power was 1.31¢ over this period; the average price of peak firm power was 2.15¢. I averaged these prices based on a hypothetical load profile of 750 MW off-peak load for every 1000 MW peak load and sixteen peak hours per day and eight off-peak. This gives an average price of 1.92¢/kWh.

Another source of price information comes from Moody’s Investments Services. For the last two years, Moody’s has published its estimate of price in each of the NERC regions. In the December 1996 report, Moody’s used a forecast of wholesale of 3.0¢/kWh in the western interconnect.\textsuperscript{37} For the NERC region in which SPS operates, they forecast the price of power at 2.0¢/kWh.

Finally I examine the wholesale prices that utilities in the state have been paying for power purchased on the wholesale market for the past few years. These numbers are very similar to the Palo Verde prices. For instance, the Plains Electric Generation and Transmission Cooperative, which purchased around 40 percent of its power requirements on the wholesale market in 1995, paid 1.99¢/kWh for that power. In 1996 it paid 1.76¢/kWh. Much power purchased by other utilities has been similarly priced.

The Moody’s forecast for prices in the western interconnect is substantially higher than are the actual prices being observed on the Palo Verde market and the power purchases being made by the utilities in the area. Indeed, the Moody’s price forecast for NERC region in which Southwestern Public Service Co. operates is much closer to the observed market prices.

\textsuperscript{37} *Moody's Calculates Little Change in Potential Stranded Investments*, Moody’s Investor Service, December 1996. Moody’s prices are based on an energy charge and a capacity charge. To get the kWh charge, I added the energy charge at full capacity utilization to the capacity charge and divided by kWh output at full capacity utilization.
Based on all these prices I use a value of 2.5¢/kWh as the forecast value of wholesale electric energy in a competitive market. This value is slightly higher than the average of the actual and forecast wholesale prices described above. Sensitivity of the forecast system average price to this value is presented below.

Q: How much would the average price change across the investor-owned utilities if the generation cost component of electricity fell to the forecast wholesale price of 2.5¢/kWh?

A: To obtain a forecast of the system-average price for the investor-owned utilities, I add the forecast competitive generation cost of 2.5¢/kWh, adjusted for line losses to the estimated fully allocated costs of transmission and generation per kWh for each of the utilities. A surcharge of 10 percent of the sum of generation, transmission, and distribution costs is added to account for the overhead costs incurred by an open access provider.

<table>
<thead>
<tr>
<th>System Average Price</th>
<th>EPE</th>
<th>PNM</th>
<th>SPS</th>
<th>TNP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecast Average Price</td>
<td>4.5¢</td>
<td>4.6¢</td>
<td>3.9¢</td>
<td>5.0¢</td>
</tr>
<tr>
<td>Current Average Revenue (1995)</td>
<td>8.2¢</td>
<td>8.1¢</td>
<td>4.7¢</td>
<td>4.5¢</td>
</tr>
<tr>
<td>Percentage Price Reduction</td>
<td>45%</td>
<td>43%</td>
<td>17%</td>
<td>-11%</td>
</tr>
</tbody>
</table>

The average system-wide price reduction across the four utilities weighted by dollar sales for each utility is 33.6 percent. If the wholesale price of electricity is assumed to be 3¢/kWh, the estimated average system-wide price reduction across the investor-owned utilities is 24.6 percent. On the other hand, if the wholesale price of electricity is 2¢/kWh, then the estimated price reduction is

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38 Line losses are reported in Form 1.
42.6 percent.

**Q: How will competitive pricing of generation affect prices at the cooperatives?**

A: As noted above, the Plains G&T Cooperative has an estimated fully allocated transmission and distribution cost of .77¢/kWh. To this I add the forecast generation cost of 2.5¢/kWh weighted by the line losses reported by Plains to be 7 percent as shown in Form 7. This gives a delivered price to the distribution systems connected to the Plains transmission facilities of 3.3¢/kWh. The average revenue collected by Plains for the power that it delivers to its affiliated distribution cooperatives was 5.5¢ over the year 1995. The forecast competitive price represents a 40 percent price reduction.

In addition, system average estimated price is forecasted for the rural distribution cooperatives. For the distribution cooperatives, I forecast competitive prices based on the forecast wholesale price of electricity of 2.5¢/kWh plus the transmission/distribution cost of the utility to which each cooperative is connected. For those connected to Plains, I add .77¢/kWh; for those connected to SPS I add .26¢/kWh. The value of .26¢/kWh for SPS is based on the costs reported in FERC Form 1 fully allocated specifically to transmission as opposed to distribution and generation and divided by system-wide kilowatt-hours delivered. The system-wide forecast prices are averaged across all distribution cooperatives in the state. This can be compared to the current system-wide average revenue, averaged across all cooperatives. The difference is my estimate of the savings that competition will produce. It is shown below.
Distribution Cooperatives

<table>
<thead>
<tr>
<th>Distribution Cooperatives</th>
<th>System Average Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecast Competitive Price</td>
<td>6.6¢/kWh</td>
</tr>
<tr>
<td>Current Average Revenue (1995)</td>
<td>8.8¢/kWh</td>
</tr>
<tr>
<td>Percentage Price Reduction</td>
<td>15.3%</td>
</tr>
</tbody>
</table>

The Percentage Price Reduction of 15.3 percent is averaged across all distribution cooperatives weighted by total sales to final customers.

Q: What, then, is your forecast of electricity prices for the State of New Mexico in an environment of retail competition?

A: My forecast is that the electricity price paid by New Mexico consumers will decline by 25 percent on average across all customer classes in all service territories when full retail competition efficiently structured and supervised by the Commission and the FERC comes to all service territories in New Mexico. I choose this value as the state-wide forecast across all customer classes because it represents the mid-range forecast of competitive reductions that were estimated in the national study conducted by myself and Professors McCormick and Sauer, and it is consistent with the specific state-wide analysis of competitive prices in New Mexico. This predicted overall price reduction is nearly the same as the system-wide price reductions averaged over the investor-owned utilities and rural electric cooperatives in the state.

Q: In summary, what are the fundamental underlying factors that form the basis of the competitive price reductions that you forecast above?
A: In the national study of electricity competition, we found that the electric power industry has enormous underutilized capacity in generation. This capacity is a result of rate regulation. Moreover, because of the nature of rate regulation, this capacity is idled much of the time. Retail competition in electricity will cause currently idled capacity to be employed. Rivalry among owners of generation assets will induce them to run their facilities full time. This additional power will be available through the integrated transmission grid to any utility that wishes to purchase it. As additional power is dumped on the market the Law of Demand says that price must fall. The extent of the price decline may vary depending on various conditions in the market, but it is clear that price will fall. In our national study, we predicted that price will fall by somewhere between 13 and 43 percent. The market price is determined by the balance of the forces of supply and demand. In the near term as capacity is more fully employed and extra power is put onto the grid, price will be determined by the elasticity of demand, that is, the responsiveness of consumers to use this extra power as price falls. Estimates of the responsiveness of consumers to price changes in electricity vary, but the best forecast elasticity is around -1 in the long run. This means that a 25 percent increase in output will cause a 25 percent decline in price. If consumers are less price responsive, which they may be in the near term, a 25 percent increase in output will cause price to fall by more than 25 percent. The conclusion is that the range over which price may vary is large and affected by short-run and long-run conditions. Hence, we presented several scenarios in the national study and arrived at 25 percent as our mid-range forecast of price declines. The same factors that were the basis of the national price predictions operate in the analysis of competitive prices in New Mexico. The competitive price forecasts presented above rest squarely on the forecast price of wholesale power. The wholesale power market is beginning
to be affected by the forces of competitive supply and demand. The potential generation from underutilized capacity is being dumped onto the wholesale market and is reflected in the price of wholesale power. Competition at the retail level will turn these declines in the wholesale price of power into declines in the retail price of electric service.

An additional quite basic reason why competition will cause price to fall is that it will bring market forces to bear on an industry that has been shielded from these forces for a very long time. Firms that invest wisely in the future will be rewarded with positive returns, while those that err will be penalized. The extent to which regulation has muted these effects can be seen quite clearly by examining the prices charged by the various investor-owned utilities in New Mexico. The average price charged residential customers by Southwestern Public Service Company (SPS) was 5.8¢/kWh in 1995, a figure that is 38% lower than the 9.4 cents charged by Public Service Company of New Mexico (PNM) and 44% lower than the 10.3 cents charged by El Paso Electric Company (EPE) Rate differences of this magnitude would not stand in a fully competitive market for electricity. At this point, it is fair to say that SPS has invested wisely, in choosing the lowest cost means of providing electricity to its customers. PNM and EPE have chosen higher cost means, and are protected by rate regulation from competitors such as SPS with lower cost structures. In the competitive marketplace of the future, firms that invest in inefficient means of generating electricity will be unable to amortize these investments. The prospect of not being able to automatically amortize investments is a threat that competitive markets impose naturally and that will induce firms to pay closer attention the consequences of investing in high cost generation facilities.

Finally, competition will cause the price of electricity to fall because the true avoidable cost of generation is much lower than the embedded historical costs that form the basis of the
prices charged by utilities now. The advances in generation technology have caused the cost of
generation to fall dramatically in the last few years. New combined-cycle gas turbines operating as
base-load units can produce power in the range of 2.5¢/kWh, which is consistent with the
wholesale price that was used in the price forecasts above.

THE BENEFITS OF COMPETITION

Q: What effects will retail competition in electricity have on the economy of New Mexico?
A: Retail competition will have significant effects on New Mexico's economy. The price of
electricity will fall significantly. People will pay less for the electricity that they currently purchase.
Businesses, schools, and local governments can divert money spent previously on electricity to
important new projects. Some uses of electricity that are uneconomic at high prices will make
sense at lower prices. Consumers and businesses will take advantage of these opportunities to
increase their well-being. Lower prices of electricity will make New Mexico a more attractive
location for new business start-ups. For all of these reasons, the gross state product and personal
income in New Mexico will increase as a result of competition in electricity.

Q: Why is competition important to the United States and New Mexico?
A: Many industries in the United States, including a number in New Mexico, must compete in a
global market. Specific examples in New Mexico that immediately come to mind are Intel,
Motorola, Philips, Phelps Dodge and Molycorp. In order to compete effectively they must control
the cost of production inputs. Electricity, for many industries, is the second highest cost
production input second only to labor. In some, such as industrial gases, electricity is the highest
cost production input. Labor costs in most other countries that compete with the United States are considerably less than ours. Thus the deregulation of the electric industry has a tremendous effect on the ability of U.S. and New Mexican industry to compete effectively. Deregulation initiatives at the Federal level and virtually every state are testimony to the brewing situation. Most analysts agree that competition in electricity will serve the public interest in much the same way that deregulation in trucking, airlines, and telecommunications has served the American economy. Exhibit 4 provides a summary of findings for previous deregulations which find that prices are lower across the board.\textsuperscript{39}

\textbf{Q: Can the effects of competition be quantified?}

\textbf{A:} Yes, some of them can be quantified. The savings realized by consumers on existing purchases are the most straightforward. The table below presents the total expenditure on electricity in New Mexico along with expenditure made by the three major customer classes—residential, commercial, and industrial. The figures in the first row are expenditures. These data are taken from the U.S. Department of Energy, Energy Information Administration (DOE-EIA) Form 861 for 1995. Total expenditures on electricity in the State of New Mexico were over one billion dollars in 1995. Residential consumers spent $368 million on electricity.

One effect of retail competition is the savings that consumers will realize through competitively induced price reductions. For instance, a price reduction of 15 percent will save residential consumers in the state $55 million. A 25 percent price decline will mean that residential consumers will have $92 million extra money to spend. Across all customer classes, a 25 percent price decline will mean savings of $278 million for electricity consumers in the state. All these

numbers are shown in the table below. The savings created by competition are simply the
competitively induced price decline in percentage terms times 1995 expenditures.

<table>
<thead>
<tr>
<th>Range of Potential Price Decline</th>
<th>Savings on 1995 Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%</td>
<td>$55,222,200 $60,437,400 $37,330,200 $166,802,400</td>
</tr>
<tr>
<td>25%</td>
<td>$92,037,000 $100,729,000 $62,217,000 $278,004,000</td>
</tr>
<tr>
<td>40%</td>
<td>$147,259,200 $161,166,400 $99,547,200 $444,806,400</td>
</tr>
</tbody>
</table>

Q: You give three different estimates of the percentage price decline that will result from retail competition. What is your best estimate?

A: I estimate that competition will reduce the average price of electricity by approximately 25 percent as I discussed earlier in the testimony. I recognize that there is a possible range over which competitive price declines may occur. The table above also presents estimated savings for price declines of 15 percent and 40 percent, which is approximately the range Professors McCormick, Sauer and I found in the national study.

Q: Have you considered any other method to estimate these savings?

A: Yes. There is considerable variation in the prices charged by the IOUs in New Mexico. Southwestern Public Service Company is the lowest cost utility in the state, and is a reasonable proxy for the prices of all New Mexico IOUs in a competitive environment. If prices in other service territories were to decline to those of SPS, savings very close to those projected above would be realized. For example, the table below presents the effects of reducing the price
charged to non-SPS customers to those charged by SPS. Residential consumers save over $130 million on current purchases in this case, with total savings across customer classes of nearly $300 million. These figures are very similar to the savings estimated above for a 25 percent price decline across the board and offer independent corroboration of our other price forecasts.

<table>
<thead>
<tr>
<th></th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savings On Current Purchases by Customer Class by Charging Prices of SPS to all New Mexico Customers</td>
<td>$130,225,913</td>
<td>$132,110,169</td>
<td>$34,319,253</td>
<td>$296,655,335</td>
</tr>
</tbody>
</table>

Q: Are not the savings enjoyed by consumers because of these price declines merely transfers from electric utilities to electricity consumers?  
A: Yes and no. In the short run, these are transfers in the sense that they represent reductions in revenues that the utilities would receive in the absence of retail competition. Utilities currently justify these revenues, which they get because of the high prices they charge, on the basis of investments they have made in generation capacity. In the short run, competition will cause price to be determined by the intersection of demand and the generation capacity of the system.

Generation capacity is in place. The historical capital cost of this capacity will not influence the competitive price. Hence, the competitive price will fall benefitting consumers and causing the revenues of utilities to decline.

The savings to consumers that result from lower competitively driven prices might be called transfers to the extent that the lower competitive prices also reduce utility revenues. Even so, consumers in New Mexico have paid very high prices for a long time and one could just as easily label these payments as transfers from consumers to the utilities. The question of transfers is a two-edged sword.
However, in the long run these savings will no longer be transfers and will thus represent net gains to the entire economy of New Mexico. Competition will drive price down to the cost of production and keep it there. Currently, the price of electricity is substantially higher than the avoidable costs of production, and has been that way for some time. Hence, electric utilities are now and have been receiving transfers from consumers for many years that would not exist in a competitive market. Competition will bring an end to this very large transfer from consumers to utilities. In the future, price will only be based on true cost, and the savings of the same magnitude as those shown above will be gains to consumers in New Mexico that are based on avoiding the wasteful expenditures that are embodied in the high electricity prices that New Mexico consumers are currently paying.

**Q: In addition to the savings due to price reductions, are there other gains to the State of New Mexico?**

**A:** Yes. One is the net gain in consumer well-being that results from increased use of electricity when price goes down. This is measured by valuing the increased consumption of lower-priced electricity. These gains are net gains and do not involve issues over transfers from one group to another. We can call these benefits the net consumption value of electricity.

**Q: What is the magnitude of these gains?**

**A:** The magnitude of these gains depends on the responsiveness of electricity demand to lower prices and the extent of the price decline. These gains become larger when demand is more responsive to the decline in price. The net gain in consumer well-being that results from a price decline is measured by economists as the area under the demand curve. Stated simply, this gain is
calculated by multiplying each additional unit of electricity purchased by the difference between its value and the cost of obtaining it.

This product is then summed for all additional units of electricity purchased, yielding a number that represents the value (net of cost) of all increased purchases. Put differently, lower prices induce additional consumption. The net consumption value of these extra purchases is the excess of consumption value over the purchase price. This concept is illustrated in the figure shown as Exhibit 5.

Q: Using this method of quantification, what do you estimate to be the net benefits to New Mexico?

A: The following table shows the net benefits to New Mexico corresponding to the figure above for price declines ranging from 15 to 40 percent assuming various measures of price responsiveness. This table is based on data from DOE-EIA Form 861, indicating purchases in New Mexico during 1995 of 16,416 million kWh at an average price of 6.8¢/kWh.

<table>
<thead>
<tr>
<th>Price Elasticity</th>
<th>-0.25</th>
<th>-0.5</th>
<th>-1</th>
<th>-1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price Decline</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15%</td>
<td>$3,139,473</td>
<td>$6,278,946</td>
<td>$12,557,893</td>
<td>$18,836,839</td>
</tr>
<tr>
<td>25%</td>
<td>$8,720,759</td>
<td>$17,441,518</td>
<td>$34,883,035</td>
<td>$52,324,553</td>
</tr>
<tr>
<td>40%</td>
<td>$22,325,143</td>
<td>$44,650,285</td>
<td>$89,300,570</td>
<td>$133,950,855</td>
</tr>
</tbody>
</table>

Price responsiveness is measured by the price elasticity of demand. Price elasticity measures the percentage change in kWh consumption that is caused by a percentage change in price. The
elasticities in the table range from a relatively unresponsive value of -0.25 (kWh consumption increases by .25 percent for each 1% change in price) to a relatively responsive factor of -1.5. In the long run, a price elasticity of about -1 is an appropriate measure of the price responsiveness of electricity demand based on our own analysis and that of numerous other researchers. This represents an average across customer classes, with industrial demand being especially price sensitive, and residential and commercial demand less so. Using this measure of responsiveness (-1), a price decrease of 25 percent generates a net gain in consumption value of about $34.9 million.

Q: Are the benefits measured by net consumption value additional benefits over and above the savings that consumers realize from lower prices?
A: Yes. The savings represent the decline in expenditures for electricity purchases that take place at the current price. The net consumption value measures additional gains that are obtained when additional purchases of electricity are stimulated by the decline in its price. These two measures can be added together. The sum is the total gain in consumption value to the state.

Q: What is the total expected gain in consumption value to the State of New Mexico from retail competition in the electric industry?
A: The total gain in consumption value from retail competition in electricity is $312.9 million per year.

Q: How do you interpret this measure of the net gain in consumption value, and in


40 See Maloney, McCormick, and Sauer, CSE study, Vol II for a summary of the literature and discussion of the appropriate price elasticity of demand.
particular, do these estimates of the net consumption value of electricity provide evidence that competition in electricity markets is in the public interest?

A: The net consumption value of electricity is the difference between how much electricity is worth to consumers and how much it costs. Net consumption value is inversely related to cost. If cost goes down, value to the consumer goes up.

    Competition is a mechanism whereby cost is directly linked to market price. Competition forces price down to cost, thereby increasing net consumption value. This clearly furthers the public interest. Where feasible, competition is in the public interest because it links price and cost and maximizes value net of cost. This is feasible now in the case of electricity.

    The estimates given above strongly support the argument that retail competition in New Mexico is in the public interest, and will result in more just and reasonable rates. These estimates represent value to the citizens and the economy of New Mexico that goes unrealized under the current regime of regulated, de facto monopoly. This value is a monetary measure of the impact of competitive electricity markets on public well-being. This value is a pure benefit to the public, uncontaminated by issues over transfers of wealth between consumers and producers.

Q: Based on a 25 percent decline in the price of electricity, how large are the savings for a typical New Mexico household?

A: Residential savings are $153 per household per year based on total estimated savings of $92 million and the 1995 estimate of the number of households in New Mexico from the U.S. Bureau of the Census. Further savings for New Mexico households will be realized as commercial and industrial users transfer reductions in electricity costs into lower prices for their customers.
Q: Can you be confident that household consumers of electricity will enjoy savings on their electricity bills due to competitive price declines that are similar to the average savings system-wide?

A: Yes. To investigate this issue, I constructed a forecast of competitive price specifically for residential consumers. To do this I estimated the cost of transmission and distribution per kWh for residential consumers as distinct from the other customer classes.

Transmission costs for serving residential customers are assumed to be equal to the total cost of transmission fully allocated in the manner described earlier divided by system-wide kilowatt-hours delivered. Distribution costs for serving residential consumers are assumed to be the total cost of distribution fully allocated in the manner described earlier divided by non-industrial kilowatt-hours delivered and multiplied by 10 percent. Residential distribution costs are estimated by dividing by non-industrial sales because many industrial customers use no distribution facilities. Hence, the cost of distribution facilities should be allocated only to those customers that use the distribution system. Dividing by all consumption other than industrial sales gives a conservative estimate of the cost of distribution per kWh for consumers using the distribution portion of the system. Among the consumers that do use distribution services, residential customers use more than commercial and other customers. Hence, I inflate the average distribution cost by 10 percent as an estimate of the distribution cost for serving residential users. This estimation method is applied to both investor-owned utilities and cooperatives.

Q: How much do you forecast that prices will fall for residential customers of the IOUs?

A: To forecast the competitive price for residential customers I add competitive generation cost adjusted for line losses to estimated transmission plus distribution costs per kWh. Hypothetical
line losses for residential customers are calculated from the company’s reported line losses in 1995. A surcharge of 10 percent of generation, transmission, and distribution costs is built into the forecast price to account for the costs incurred by an open access provider. The forecast price per kWh and percent price reduction from 1995 levels for residential customers is given below:

<table>
<thead>
<tr>
<th>Residential Consumers</th>
<th>EPE</th>
<th>PNM</th>
<th>SPS</th>
<th>TNP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecast Price</td>
<td>5.3¢</td>
<td>5.8¢</td>
<td>5.3¢</td>
<td>6.1¢</td>
</tr>
<tr>
<td>Current Average Revenue (1995)</td>
<td>10.3¢</td>
<td>9.4¢</td>
<td>5.8¢</td>
<td>8.5¢</td>
</tr>
<tr>
<td>Percentage Price Reduction</td>
<td>48%</td>
<td>39%</td>
<td>8%</td>
<td>28%</td>
</tr>
</tbody>
</table>

The average price reduction for residential customers weighted by dollar sales for each investor-owned utility is 34 percent.

Q: Will residential consumers in rural areas suffer if competition is introduced?
A: No; rural consumers stand to benefit significantly from competition. The forecast competitive price for residential customers served by rural electric cooperatives is estimated to be 27.1 percent lower than their current average price. This price forecast for residential customers shows that they will experience substantial reductions in price due to competition, and while the percentage price reductions that they will enjoy may be somewhat less than the savings that urban consumers will get, the savings to rural consumers as a percent of their disposable income is much bigger.

Q: You suggest a comparison of electricity prices and income. What does such a comparison look like across the state?
A: The rural population of New Mexico has lower median household income than the metropolitan areas and pays higher prices for electricity. The table in the appendix shows median household income by county, along with the average residential price of electricity supplied by the primary service providers in each county. The two poorest counties, Mora and Guadalupe, have median household income less than $13,500, much lower than the norm for the state, and pay residential rates in excess of 12¢/kWh, much higher than the norm for the state. Of the 13 county/service area pairs paying residential prices in excess of 12¢/kWh, only 3 have median household income over $20,000 in the county. By contrast, for county/service area pairs paying residential prices less than 7¢/kWh, 7 of the 10 have county median household income in exceeding $20,000.

Q: How will competition affect the price of electricity in the various regions of the state?

A: Residential prices will decline in all areas as a result of competition. Part of the current difference in price between rural areas and cities is accounted for by the higher costs of distribution in rural areas. In the near term, competition between generation providers will not change how power is distributed nor this component of the cost of delivered electricity. But it will significantly reduce the component of cost due to generation.

As a result, rural consumers will realize savings that are a significant portion of their income. Exhibit 6 lists the prices forecast by utility and rural electric cooperative, the percentage price decline, and median household income for the primary counties served by each of the electric cooperatives and investor-owned utilities. The competitive prices for each utility and cooperative have been calculated on the assumption that distribution costs will remain the same under competition. Only the cost of purchased power is affected in this calculation.
Q: How are electricity savings distributed across the counties in New Mexico?

A: The following chart organizes the data by median household income. The savings from current power purchases of these customers is then compared to the median household income of the county. Consumers in the poorer counties, those with median household income less than $17,500 realize savings in excess of 1 percent of median household income. The chart makes it clear that competition will bring significant benefits to consumers in New Mexico's rural areas.

Q: Are the existing high prices of electricity a deterrent to economic growth in New Mexico?

A: Yes, and competition in electricity can change that. Lower electric rates will reduce the cost of doing business in New Mexico. This will make New Mexico a more attractive state for new businesses and expansion of existing operations. Under regulation in New Mexico, statutory exceptions to regulatory rate-making requirements were required to implement economic development rates. Such an approach is a poor substitute for competition.

Q: Has the effect of electricity prices on the New Mexico economy ever been quantified?

A: Yes. In 1987, the University of New Mexico's Bureau of Business and Economic Research used its model of the New Mexico economy (FOR-UNM) to estimate the effect of a 15 percent decline in the price of electricity. Their conclusion was that a rate decrease of this magnitude would (1) create 2,600 new manufacturing jobs, (2) increase total state employment by 5,100, and (3) increase personal income in New Mexico by $125 million.
Q: What are the basic forces behind these effects?

A: The effects come from two sources. First, a decline in the price of electricity will make New Mexico a relatively more attractive location for industrial location. A decline in electricity prices in New Mexico relative to other states increases the likelihood that manufacturing industries will choose New Mexico over alternative locations. Second, the increase in manufacturing output and employment leads to an increase in output and employment in support industries and services via multiplier effects.

Q: Can you explain the multiplier effects?

A: In a nutshell, increased income of newly employed persons will lead to increased spending by them. This round of spending represents income for its recipients; hence, a multiple increase in income, greater than the income earned by the newly employed persons will be created. The multiplier effect is a phrase that refers to the process where an initial increase in income leads to a total increase in income that is a multiple of the initial increase. For example, suppose that lower electricity prices encourage a manufacturer of circuit boards to locate his operation in Las Cruces rather than in Utah. The people making circuit boards are paid for their work. They then go to local stores and spend some of this income. This increase in spending represents an increase in income for its recipients, and on average their spending will increase also. Adding up all of the increases in income induced by the initial increase leads to a total increase that is a multiple of the initial increase in income.

Q: Is there any tangible evidence that businesses are concerned with electricity costs when
to locate their operations?

A: Yes. First, in the current system, some companies with relatively large electricity requirements can exercise choice by locating in regions where electricity prices are low. The following chart illustrates that industries that use electricity intensively locate where electricity prices are lower. Intensity of electricity use is measured by the ratio of expenditures on electricity to the total value of production by the industry. The chart clearly shows that industries that use electricity more intensively pay lower electricity prices.

![Electricity Expense as a Share of Value of Shipments and Electricity Prices](chart)

Second, a recent survey of economic development executives by Conway Data found that the cost and reliability of electric power and natural gas was an important factor in business location decisions. Approximately 1 in 5 of the executives surveyed ranked the cost and reliability of power in the top five factors driving site selection of businesses. While many other factors are

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41 All data are for manufacturing industries at the 2 digit SIC level. Electricity expenditures are taken from the Manufacturing Energy Consumption Survey, U.S. Department of Energy. The value of production is from the 1990 Annual Survey of Manufactures, U.S. Census.

42 Site Selection, p. 436, April 1996.
important, such as labor force quality and transportation infrastructure, these factors cannot be
changed simply and quickly by a single policy decision.

The direct and obvious policy implication is that if the price of electricity in New Mexico falls relative to other states, more businesses will locate and expand their operations in the state. These business location decisions will increase employment and income in the New Mexico economy.

Q: Are these effects dependent on whether other states introduce competition in electricity markets?

A: Of course. But the impact of competition in other states has effects that work in other directions, as well. Lower prices of electricity will increase production and incomes in the national economy. This will increase the nation's demand for New Mexico products. For example, the increase in national income will increase tourism in New Mexico; firms requiring greater raw materials will increase their demand for the output of New Mexico's mines. Hence, as other states introduce competition their demand for goods and services produced in New Mexico will increase, increasing the income of New Mexicans.

When every state has introduced competition, the stimulative effect of lower prices will be greatest on those states that had higher prices to begin with. The reason for this is that a disincentive to locate in a high priced state will be removed by competition. New Mexico's prices are currently high relative to its neighbors. This means that delay in introducing competition in New Mexico is ill-advised, for the current high cost of electricity relative to the region would be exacerbated. A lengthy transition period in which high prices are maintained would similarly allow
the competitive disadvantage faced by New Mexico businesses to persist during that period. The other side of the coin is that New Mexico stands to gain by introducing competition quickly if neighboring states are slow to implement competition.

Q: Has the impact of electricity prices on the economy been examined in the economics literature?

A: There are a number of studies which document that the use and availability of energy, and electricity prices in particular, have important stimulative effects on the economy. Energy costs play an important role in labor productivity and economic development. John Moroney documented that output per worker was positively related to energy use. Specifically, Moroney found that labor productivity was significantly higher in economies that use energy more intensively. Further, numerous demand studies document that the industrial and manufacturing sectors make more intensive use of electricity when its price is lower.

Moroney's evidence squares with the widely held view that energy price increases during the 1973-1980 period are responsible for the slower rates of economic growth realized in the last 25 years in the United States. Throughout this period the U.S. continued to accumulate capital, labor, and raw material resources at historical rates. Output has not kept pace however due to slower rates of growth in productivity. Many economists trace the origins of the productivity slowdown to the energy price increases in the 1970s. That productivity growth has recovered in recent years as the real price of energy has declined, is evidence supporting this view.

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Q: What about electricity in particular?

A: Dale Jorgensen examined production at the industry level, and found that lower electricity prices increase productivity. Specifically, Jorgensen found that "a decline in the price of electricity stimulates technical change" in 23 of the 35 industries studied. This means that firms achieve gains in productivity by making greater use of innovative, energy intensive technologies when electricity prices fall. This point is well developed in the economic history literature by Nathan Rosenberg. Rosenberg emphasizes the unique role played by electric energy throughout the entire 20th century development of the American economy. As electricity became less expensive and more widely available, production processes were fundamentally altered in more efficient ways to take advantage of this inherently flexible and mobile source of energy. The American economy is more productive as a result.

Q: Will lower electricity prices increase the income and output in New Mexico's economy?

A: Yes. Moroney's evidence on labor productivity can be used to estimate the increased output in New Mexico's economy due to lower electricity prices and more intensive use of electricity.

The most recent calculations of gross state product by the U.S. Bureau of Economic Analysis are for 1994; New Mexico GSP totals $37,832 million for this period. This same report indicates that New Mexico real GSP has increased at an average annual rate of 4.6 since 1987. Using the recent historical growth rate in New Mexico GSP and accounting for inflation, 1997

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GSP is projected to be $46,268 million.

Assuming a long run elasticity of demand for electricity of -1, which is representative of many studies in the economics literature, the percentage increase in electricity consumed will equal the percentage decrease in its price. Moroney’s evidence implies that for a 25 percent decline in price, more intensive use of electricity will increase output per worker by 1.54 percent.

**Q: What is the effect of increased output per worker, or greater labor productivity, for New Mexico?**

**A:** Let's suppose that all long run adjustments stemming from competitive pricing of electricity had been realized by 1997. Keeping the number of workers in New Mexico constant, an increase in their productivity of 1.54 percent implies that the gross state product of New Mexico would have been higher by $626 million.
Q: Is your estimated increase in gross state product in addition to the benefits of increased consumption value in electricity?

A: Yes. The estimate of the increase in gross state product is over and above the benefits derived by consumers from lower electricity prices.

Q: Does the estimated increase in gross state product include the multiplier effects associated with new industrial development that you mentioned above?

A: Yes. Our method of estimating the increase in gross state product is one method for calculating the expansionary effects on the state economy that will result from lower electricity prices. Therefore it includes the multiplier effects associated with new industrial location mentioned above.

Q: Is it appropriate to measure the total benefits of lower electricity prices by adding the increased consumption value to the estimated increase in gross state product?

A: No. The two measures characterize different aspects of the benefits of lower electricity prices. Because of this they cannot be directly summed. However, these effects are real and can be used as a measure of the significance of this change in the structure of the economy.

Q: What are some of the consequences to the economy if lower prices through competition are delayed?

A: With the change in gross state product (GSP) in mind, it is simple to consider the consequences of a lengthy transition to a competitive market in electricity. If competition is
delayed, say for ten years, this prolongs the period in which the potential for greater production of goods and services in the state is denied. The cumulative loss over a ten year period in New Mexico's gross state product from maintaining high electricity prices would be over $7.7 billion in 1997 dollars. These losses are displayed in the graph below, illustrating the magnitude of the loss in output for a delay in introducing competition of from 1 to 10 years.

Q: Won't these losses be made up once competitive pricing is realized?
A: No. The figures displayed in the chart represent a lost opportunity. If you fail to put in the crop, you forever lose the opportunity to put the hay in the barn. A delay of 10 years in bringing competitive electricity prices to New Mexico means that its citizens will have lost an opportunity during that period to increase their welfare. These losses are like the hay in the barn: if it's not produced in 1998, it won't be "made up" somehow in 2004.

Q: What are the implications of lower electricity prices on state taxes?
A: The issue is at once both simple and complex. It is simple, in that the increase in production stimulated by lower electricity prices will unambiguously increase tax receipts in the long run. It is complex in that the various channels by which state and local taxes are effected are varied, with some sources of revenue increasing and other sources decreasing as a result of lower electricity prices.

Q: Can you illustrate how much will tax receipts change in the long run?
A: My calculation uses 1997 as a base year, and assumes that long run adjustments to lower
electricity prices increase New Mexico’s GSP by $626 million. The overall effective tax rate on New Mexico GSP is about 8.9 percent, using net tax receipts of $2,836 million for the 92-93 fiscal year and GSP of $31,863 million. An increase in GSP of $626 million would thus result in additional state tax revenues of about $55.7 million.

A PRINCIPLED APPROACH TO THE STRANDED COST ISSUE

Q: You say above that competition must be efficiently implemented by the Public Utility Commission in order for the full measure of benefits to be enjoyed. In your opinion what is the most important aspect of the implementation of competition?

A: Without question, the biggest issue in implementing competition in the electric industry is so-called stranded costs. If the New Mexico Public Utility Commission allows full recovery of stranded costs, the lions’ share of the benefits from competition to the consumer will be lost. Moreover, there is no economic justification for stranded cost recovery and, indeed, there are strong reasons why stranded cost recovery should be completely denied.

Q: Your opinion is not universally shared. On what basis do proponents of stranded cost recovery make their case?

A: Proponents of stranded cost recovery base their case on two simple propositions. First, retail competition will reduce industry revenues. Because of this, net cash flows will not be sufficient to amortize some of the investments made by electric utilities. The second proposition is based on the statutory language creating public utility commissions. It is sometimes called the "Compact
Theory." It holds that the regulator is supposed to set rates that provide a fair rate of return to investors.

**Q: What is your opinion of these arguments?**

A: Although the financial impact will vary widely across utilities, there is little doubt that deregulation will impose financial distress on some firms. However, this is not in and of itself a basis for stranded cost recovery because firms in unregulated markets face the prospect of failing to recover their investments on a continuous basis.

The crux of the issue rests on the interpretation of the second proposition; i.e., what does a "fair rate of return" mean? Proponents of recovery insist that all investment projects initiated by utilities with the consent of regulators are entitled to receive the agreed upon fair rate of return until these projects are fully amortized. If competition renders this impossible, proponents argue that stranded cost recovery be implemented to make up the difference.

I differ with this view. In my opinion, a fair and objective review of the case for stranded cost recovery leads to the conclusion that a "fair rate of return" does not mean a guaranteed rate of return and that investments that must be written down because of competition should receive no different treatment by the Commission than they would in a competitive market.

**Q: In the matter of stranded costs, what are the economic principles by which the case for stranded cost recovery should be judged?**

A: An objective evaluation of the case for stranded cost recovery should rest on three basic premises. These premises are derived from answering the following questions. First, what is the
Historically and with a few minor exceptions, the New Mexico Public Utility Commission has granted a Certificate of Convenience and Necessity to one utility to construct or operate public utility plant or system in any particular area of the State of New Mexico. Thus, utilities have been granted de facto monopolies in any given area, thereby avoiding duplication of certain facilities, primarily lines and poles. The monopoly pricing power granted through the certification process is a de facto monopoly rather than a de jure monopoly. The Commission does not specifically grant a monopoly service territory. Rather it creates a de facto monopoly through the decision not to grant additional certificates of convenience and necessity to other utilities to construct facilities to serve electricity consumers. The motivation of the Commission is to avoid unnecessary duplication and waste.

Q: What is your view of the role of public utility commissions in the process of rate regulation?

A: The public interest rationale for regulation by the public utility commission is straightforward. To take advantage of local economies of scale, the commission licenses a single utility to provide service, thereby avoiding unnecessary duplication. The act of certificating a single utility to construct plant in a given area confers monopoly pricing power to the utility in the absence of further action by the commission. To address this, the utility’s rates are regulated. The primary intent of this regulation is to deliver prices that reflect the costs of providing power.

In order to induce investors to provide service under these conditions, the commission must set rates so that expected returns to utility investments are attractive relative to other opportunities, otherwise insufficient investment in electricity will occur. Hence, the rates allowed by the commission are designed to yield what is called a “fair” rate of return to qualified investments made by the utility. Nevertheless, rate of return regulation under this principle does not as a practical matter and cannot as a theoretical matter deliver a guaranteed rate of return.
Nor can it indemnify the utility against all events in a risky world. In setting a fair rate of return on qualified investments, the commission’s aim is to engender sufficient production at a competitive price, not to grant an entitlement.

There are sound reasons why the competitive market outcome is an appropriate benchmark for the commission. Competitive forces induce firms to produce at minimum possible costs, and drive prices down to these costs, eliminating excess profits. The commission is designed to deliver these salutary results in a setting where direct competition is precluded. Standard economic theory implies that this objective is a reasonable one because competitive market outcomes generally yield maximum social well being.

Q: What is your view of the responsibilities of the regulated utility in the process of rate regulation?

A: Under regulation, it is the responsibility of the electric utility to deliver reliable power at minimum possible cost. The regulated utility must make investments that are efficient and engage in efficient business practices. In the unregulated business world, competitive pressures induce businesses to operate efficiently, providing consumers with the desired combination of quality and price for goods and services. In the regulated utility industry, it is incumbent upon the utility to choose cost minimizing methods for serving its customers. The public utility commission is an overseer that attempts to ensure that this takes place. However, it is the utility's management that is responsible for making decisions that are in the public interest and maximize the value of the firm.

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47 Regulation has not precluded utility bankruptcy.
Q: In the State of New Mexico, are regulated utilities not directed to make investments by the Public Utility Commission, and does this not mean that these investments are part of a contract with the government?

A: No. The utility undertakes investment with the approval of the Commission, but the utility is not generally directed to make specific investments by the Commission.\textsuperscript{48} The utility projects future sales and determines whether it should build new facilities.\textsuperscript{49} The utility must prove to the Commission that the new plant is useful to the public. The Commission then allows rates that are expected to amortize the investment and generate a fair return on shareholder equity. Even so, the method of calculating electricity prices--based on the allowed rate of return on investment at the time that the asset is allowed into the rate base--is not a grant of an entitlement to the utility for this revenue. It is simply a mechanical procedure to set a price that most closely mimics the price that would prevail in a competitive market.

Q: What is your view of the role and responsibilities of investors and consumers in the

\textsuperscript{48} If it were, the issue would be a simple one. The Commission would be viewed as an agent of the consuming public that writes a cost-plus contract with the utility. In this scenario the utility is similar to a construction firm. For making mandated investments in power production, the utility would be paid its expenses plus an operating margin, amortized over a 20 or 30 year period. If regulation took the form of cost-plus contracting, this would clearly burden the Commission with the responsibility of compensating the utility for stranded costs as a result of deregulation. Although cost-plus contracts are used in the construction industry and elsewhere, they are an inappropriate model for utility regulation for three reasons. First, these contracts are generally created via a competitive bidding process, thereby allocating the contract to the lowest cost producer. Competitive bidding has not been used in public utility regulation. Second, the principal in the cost-plus contract acquires the assets once they are produced by the agent. In the regulated utility industry, these assets continue to be owned by the utility. Third, the statutory authority of the New Mexico Public Utility Commission does not allow it to contract with utilities in this way.

\textsuperscript{49} In most states including New Mexico the utility must apply for a Certificate of Convenience and Necessity (CCN) before being allowed to invest and build plant. The burden is on the utility to prove to the commission that the investment to be made is for the public convenience and that the investment is necessary. However, the acquisition of a CCN is not a statement or a guarantee that the costs of the facility in which the utility invested will be borne by consumers.
process of rate regulation?

A: Investors voluntarily accept risk when capital expenditures are made; consumers do not. This is the pattern in virtually all lines of commerce. As a general matter, investors put their money at risk and hope to earn positive returns from efficient, well managed enterprises. At the same time, they know that they may suffer negative returns from projects that prove inefficient due to poor management or bad luck.

In unregulated markets, variation in returns according the skill and success of firms allows efficient firms to attract capital and inefficient firms or managers to be replaced. These forces are muted when the rate of return does not vary according to the efficiency with which a business is run. This causes investment capital to be poorly allocated across the economy.

In the utility industry, the regulator is the arbiter of whether costs incurred by the utility were prudently incurred. If so, the allowed rate of return is applied to these costs. That investments receive this initial sanction by the Commission does not mean that they are granted a guaranteed return of this amount throughout their life. Initial approval by the Commission means that an investment is judged to be efficient ex ante. The fair rate of return applied to the investment is a way for the Commission to set a price for the output of the firm delivered to the consumer that approximates what the competitive price would be. Competitive prices change and so, too, should regulated prices.

Investments that are efficient ex ante can become unprofitable *ex post*. This is true in private markets and in regulated markets. In private markets, competition determines the price of output and by that, the return on investments. If the price of output falls, investors suffer shortfalls in the return that they expected *ex ante*. In regulated markets--since the role of the
public utility commission to set a price of output that mimics the price that would prevail in a
competitive setting--the commission should meet its duty to consumers even if this price is
insufficient to generate the return investors expected *ex ante*. Investors are never guaranteed their
*ex ante* expected return in either private or regulated markets. Capital markets exist in order to
spread the risk of investment outcomes in a way that minimizes their impact. Indeed, in a healthy
capital market, the risk that one product will fail--because it is supplanted by another--imposes no
risk on well-diversified investors. Put more emphatically, investors have no legitimate claim that
they are harmed by capital losses due to competitive pressures because if they are fully diversified
they suffer no harm. It is their responsibility to be fully diversified or suffer the consequences.

Q: How are consumers treated in the process of rate regulation?
A: Electricity consumers are passive in the regulated market, since they cannot exercise their
normal role of choosing among alternative suppliers. They are served by a single utility and the
regulatory commission and therefore depend upon both institutions act in good faith, in the
overall public interest. It is plainly inefficient, not to say unfair, to have passive consumers, with
no alternative choices, bear the risk of bad utility investments.

To the extent that utilities invest excessively and the public utility commission allows
inefficient expenditures into the rate base, consumers and the overall public interest are both ill
served. Excessive costs are incurred as a result, reflecting the inefficient diversion of scarce
resources into this sector of the economy. Consumers are penalized in the form of higher prices
and have no recourse but to suffer these. This diversion of resources into the utility sector
necessarily means that resources are denied to other sectors of the economy. This causes under-
investment in these other sectors and hence reduces social welfare.

Utilities that have overpriced assets (now referred to as stranded investments) have been collecting these excessive costs from consumers in the form of rates in excess of market clearing prices for a considerable period of time in New Mexico, easily in excess of ten years. A conservative estimate shows that New Mexico consumers have paid rates in excess of competitive prices in real dollars over the past decade in an amount approximating $4 billion and are continuing to pay rates in excess of competitive rates at a level of approximately $340 million a year. For a state with a population as small as New Mexico, with as many of its citizens below the poverty level, this state of affairs is having a devastating effect on the well being of New Mexicans.

Q: Having defined the roles of the various participants in the rate regulation setting, what light does this shed on the issue of stranded costs?

A: By examining the roles of the Public Utility Commission, the utility, utility investors, and utility consumers, it is my opinion that only one conclusion can be drawn: The only costs that should be recovered through regulatory induced charges are those that would be recouped in a competitive market. The purpose of the public utility commissions in general and the New Mexico Public Utility Commission in particular is to act as a surrogate for competition in setting price. The utility management, investors, and consumers have the duty to be mindful that this is the role of the Commission. As Alfred Kahn poignantly writes:

"[T]he single most widely accepted rule for the governance of the regulated industries is
[to] regulate them in such a way as to produce the same results as would be produced by
effective competition, if it were feasible."\(^{50}\)

Since the move to retail competition in electricity is the process of now imposing a real
market where the Commission attempted to simulate one before, any changes in capital values
that result from the move to retail competition are necessarily part of the proper functioning of
rate regulation carried out by the Commission acting in the public interest. Since these changes in
capital values would be borne by investors in a competitive market, they should be borne by
electricity investors in the move to competition. Hence, there is no legitimate claim for recovery
of stranded costs based on the public interest theory of rate regulation.

Indeed, the New Mexico Public Utility Act states:

"§ 62-8-2. Service. Every public utility shall furnish adequate, efficient and reasonable
service."

Because low cost electricity service is now available through open-access competition, and this
adequate and reasonable service would be impinged by imposing a stranded cost recovery fee, it is
my opinion that it would be unlawful for the Commission to impose stranded cost recovery.

**Q: But did the Commission not approve of the investments made by the utility and should this not mean that they receive treatment different from investments made by non-**

\(^{50}\) Alfred E. Kahn, *The Economics of Regulation*, vol. 1, at 17 (MIT Press, 1988).
regulated firms?

A: It is the role of the Public Utility Commission acting in the public interest to determine if investment programs of the utility are efficient in an ex ante sense. If investments are judged to be prudent before the fact, the public utility commission allows them to be undertaken and allows the utility to earn a fair rate of return. “Fair” does not mean “guaranteed.” The fair rate of return is simply a way for the commission to approximate what would be the competitive market price given the information available at the time the commission approves the investment.

It does not follow from the process of public-interest rate-regulation that the public utility commission should indemnify the utility from all unforeseen events through rate adjustment or other charges. Unforeseen changes may make some ex-ante efficient projects losers in the normal course of business in any industry. The proper role for the Public Utility Commission is to act as a replacement for competitive market rivalry. Hence, it should attempt to emulate the result that the market would deliver in the event of significant changes in market conditions.

Q: Can you give an example of this?

A: Consider what would happen if electricity were supplanted by another form of energy. What if breakthroughs in solar technology allowed consumers to heat and cool their homes at virtually zero cost? Clearly, utility sales and profits would evaporate. The service territories granted to the utilities would be a moot point in this case because consumers could leave their current suppliers without contracting with another utility. The investments made by utilities could not be recovered except by taxes levied on the general public.

If such a breakthrough actually took place, there could be no claim that investors are
“fairly” owed compensation for this otherwise fortuitous event. Investments in the ordinary business world fail for similar reasons on a continuous basis. New products that consumers find appealing cause returns to investments in competing products to decline. That is the nature of business and the risk that investors protect against by diversification.

**Q: In what sense is the move to retail competition in electricity similar to your hypothetical example of the technological discovery of “free” energy.**

**A:** New generation technologies that can be made available to consumers because of recent advances in system control that allow for open-access competition are unforeseen technological developments similar to the hypothetical scenario considered above. Because of these, consumers now have an attractive alternative source of energy besides their local utility. This real world case differs from the hypothetical scenario in that the Commission must explicitly grant consumers the right to by-pass the local energy generation source by granting competitors open access to the local distribution system.

**Q: How should the consequences of industry change be viewed by the three groups involved? That is, what is the proper role for the Public Utility Commission, the utilities, and consumers in dealing with this technological innovation?**

**A:** The answer is clear. The Commission should treat this breakthrough just as the market would in any other industry because the Commission's role is to guide the industry as if it were competitive. The proper role for utilities is for their financial investors to bear the burden of the lost revenues and lower profits because investors are supposed to be diversified against this
outcome. Finally, consumers should be presented the menu of choices provided by competitive suppliers.

Q: Is it possible that utility investors assumed that they were guaranteed a return even though the theoretical model of rate regulation is not founded on this principle?

A: As an empirical matter, it is clear that financial investors have never viewed investment in the electric utility industry as risk free. If they did, then the debt of public utilities should have the same risk level as nonrecourse government bonds. Even a superficial analysis of bond prices and yields reveals that electric utility debt has a higher return. This means that investment in electric utility bonds is higher risk than comparable risk-free government securities.

The facts speak for themselves. Yields to electric utility and government bonds for the period 1985-1990 averaged 9.91 and 8.74 percent, respectively. Also, the electric utility yield was higher in each year. These facts imply that electric utility investment is not risk free. If investors expected a guaranteed return, the difference should average zero, but it does not. Also, the yield on utility bonds and the return on utility stocks vary in predictable ways based on the theory that both of these have an embedded risk premium. For instance, coupon interest rates and yields to utility bonds vary according to the ratings issued by investment services like Moody’s and Standard & Poor’s. These ratings are based on the riskiness of each company. In addition, two groups of researchers analyzed the response of the financial markets to the Three Mile Island accident. Barrett, et al., found that the risk premium in utility bonds increased 20 to 30 basis points following the accident.\(^{51}\) Bowen, et al., conclude from stock market movements that

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“Investors appear to believe that losses to utilities committed to nuclear energy will not be fully compensated” as a result of the Three Mile Island accident. The evidence is clear that investors have always recognized that there is no such thing as a guaranteed return in the electric industry.

**Q: How does the situation of the electric industry today compare with other industries in other times?**

**A:** There are obvious parallels between investment in electricity generation and investment programs in other industries. Indeed, the U.S. oil industry made similar investments in the 1970s and early 1980s in response to the energy crisis that turned out to be mistakes ex post. Expensive offshore exploration and development programs in the North Sea, the China Sea, and elsewhere were undertaken that would have been profitable had the world price of oil continued to increase as was projected at the time. When oil prices fell, the projects became big losers. Oil companies were characterized in the finance literature as investing $2 in development costs in order to obtain $1 worth of oil revenues in present value. The world did not turn out as the oil companies had projected, and positive returns on investment were not to be realized. Market forces caused many of these development programs to be shelved indefinitely.

Similar events occurred in the natural gas industry. The price of gas was highly regulated in the 1970s and 1980s. Regulation encouraged companies to drill deep wells and in tight sands in order to realize the high prices that these wells were allowed to receive. When gas was deregulated these wells became unprofitable because the price of gas fell so precipitously.

The regulated railroad industry provides an even stronger parallel example. Technological

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advances in air and motor travel combined with public investments in highways and air traffic control to make passenger railway service obsolete. Railroads provided passenger service under terms similar to those established in the electric utility industry. The railroad applied for a certificate of convenience and necessity and once having obtained it, had an obligation to serve. The ICC limited entry and thus competition, and as a consequence regulated rates. The development of alternative transport meant that past investments in passenger railways could not be salvaged. The decreased demand for railway traffic meant that regulated rates were insufficient to recover costs.

Unanticipated changes in technology rendered the regulator incapable of allowing the regulated firm to recoup its investment. The result was that many railroads--firms which were issued a certificate of convenience and public necessity, with an obligation to serve, and subject to rate regulation--went bankrupt in the 1960s. They were not granted stranded cost recovery when unanticipated technological change made their past investments inefficient ex post.53

Q: Does your argument depend on whether the investment in generation in the electric industry was efficient or not?
A: No. The argument against the recovery of stranded cost does not depend on whether the investment in generation in the electric industry was prudent. The question before the Public

53 Amtrak was created to provide public railway passenger service once it became clear that it was unprofitable for private railways to serve this function. Amtrak acquired assets such as passenger cars, spare parts, and supplies from private railroads, but in so doing did not compensate railroads for their ex post bad investments. The Atchison, Topeka and Santa Fe, for example, sold these assets to Amtrak for $12.3 million, creating a net bookkeeping loss on these assets of $30.8 million. See Keith L. Bryant, Jr., History of the Atchison, Topeka, and Santa Fe Railway 358 (Macmillan, 1974). Note also that railroads were forced into bankruptcy well before Amtrak was created, hence Amtrak cannot be construed in any way as a bailout of the regulated railroads.
Utility Commission is whether to move now to competition through open access. In doing so the
losses the industry stands to suffer are the product either of (1) unanticipated technological
developments that normally impose losses on investors in the capital market or (2) inefficient
investment in generation that took place under the old regulatory regime. In either case, it is
contrary to the public interest to rescue investments that turn out to have been mistakes ex post.

If the investments were inefficiently excessive, then there is obviously no case for
recovery. The regulatory regime failed in its primary purpose of protecting consumers. Utilities
failed to pursue investment programs in the public interest as statutorily defined. Regulators failed
in their role as a stand-in for competitive market forces. Consumers have been paying the
consequences for many years. If investments were inefficient ex ante, stranded cost recovery
merely extends this period of inefficiency into the future, and should be flatly denied.

Moreover, if stranded costs are the result of unanticipated developments that cause
investments that were efficient ex ante to decline in value, investors are the proper parties to bear
the risk, not consumers. This is the case whether the industry is regulated or not.

Q: Is your conclusion, then, that there should be no stranded cost recovery?
A: Yes. The case against stranded cost recovery is a strong one, whether investments in
generation were efficient ex ante or not. This is the unavoidable conclusion once the proper role
of the Public Utility Commission, utilities, investors, and consumers in the regulatory system of
the past century is clearly identified. It is improper and inefficient for government to sanction the
mistakes of the private sector by taxing consumers in order to rescue producers. This is precisely
what stranded cost recovery does. Denial of stranded cost recovery is consistent with the role of
the Commission as a substitute for salutary market forces and, indeed, is required by it.

SUMMARY AND CONCLUSIONS

Q: Can you summarize your testimony?
A: Yes. Retail competition in the electric industry is now feasible because of the integrated electric grid and because of technological advances in the efficiency of generation, open access competition can bring lower electricity prices to consumers. The current system of rate-regulation has failed to serve the public interest with rates that are fair and reasonable compared to the rates that citizens in the state can expect under a system of retail competition. Because the potential gains in efficiency due to retail competition are so large, the Commission should move with all due haste to restructure the electric industry.
EXHIBIT 1

Vita for Michael T. Maloney

Vita

Michael T. Maloney

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Home: P.O. Box 752

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(864) 656-3430 FAX-4192

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Birth Place: Jackson, Mississippi (12/7/1949)

Education:

B.A., Lewis College, Lockport, IL, 1970

M.A., Western Illinois University, Macomb, IL, 1971

Ph.D., Louisiana State University, Baton Rouge, LA, 1978
Dissertation: Bargaining Solutions in Cases of Externalities

Graduate Fields of Concentration:

(1) Economic Theory
(2) Econometrics
(3) Industrial Organization and Government Regulation
(4) Public Finance
(5) Quantitative Methods

Academic Experience:

1984-present: Professor of Economics, Clemson University
1984-1992: Head, Department of Economics, Clemson University
1990: Senior Financial Economist, Securities & Exchange Commission
1982-1984: Associate Professor of Economics, Clemson University
1981-1982: Associate Professor of Economics, Emory University
1981: Visiting Associate Professor of Economics, Emory University
1979-1981: Associate Professor of Economics, Clemson University
1975-1979: Assistant Professor of Economics, Clemson University
1974-1975: Instructor of Economics, Clemson University

Associate Editor: *Journal of Corporate Finance; Studies in Economics and Finance*
Teaching Interests:

2. Industrial Organization: empirical with financial economics orientation; pricing problems; effects of government regulation.
3. Graduate Price Theory: neoclassical theory with empirical relevance.

Publications:


**Work in Progress:**


"The Asymmetric Information Premium in Asset Pricing," with Mason Gerety,

"Acquisition Performance and Corporate Board Turnover" with William Brown.


"Block Pricing of Athletic Contests," with R.E. McCormick.

“Competitive Pricing in Markets Characterized by Natural Monopoly”

“Automobile Distribution: Some Evidence Concerning the Value of Vertical Restraints”


**Major Funded Research:**


"Economic Assessment of EPA Air Emission Regulations on the Control of Hydrocarbons, with Bruce Yandle; the DuPont Company, 1979.

"An Economic Analysis of the Cost of Delaying Nuclear Power Plants," with Mike Walsh; funded by the Water Resources Research Institute, Clemson University, 1977.


Consulting:

Figure 3 Residential Prices for Electricity in New Mexico
### EXHIBIT 3

**Median Income of Households by State**

<table>
<thead>
<tr>
<th>State</th>
<th>1995</th>
<th>Rank 1995</th>
<th>1994</th>
<th>3 year average</th>
<th>'93-'95</th>
<th>Rank, 3-year</th>
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### EXHIBIT 3

Median Income of Households by State

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## EXHIBIT 4

Summary of Findings From
Crandall and Ellig Study

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<th>Percentage Price Reduction</th>
<th>Annual Value of Consumer Benefits from Deregulation</th>
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<tr>
<td>Railroads</td>
<td>4%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Exhibit 5: Illustration of Net Consumption Value
<table>
<thead>
<tr>
<th>County</th>
<th>IOU/Cooperative</th>
<th>Current Residential Price</th>
<th>Competitive Residential Price</th>
<th>Savings per Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bernalillo</td>
<td>PNM</td>
<td>$0.094</td>
<td>$0.058</td>
<td>$221</td>
</tr>
<tr>
<td>Catron</td>
<td>Socorro Electric Coop Inc</td>
<td>$0.103</td>
<td>$0.068</td>
<td>$190</td>
</tr>
<tr>
<td>Chaves</td>
<td>Central Valley Elec Coop Inc</td>
<td>$0.067</td>
<td>$0.048</td>
<td>$163</td>
</tr>
<tr>
<td>Chaves</td>
<td>SPS (Roswell -- check)</td>
<td>$0.058</td>
<td>$0.053</td>
<td>$41</td>
</tr>
<tr>
<td>Cibola</td>
<td>Continental Divide El Coop Inc</td>
<td>$0.099</td>
<td>$0.064</td>
<td>$181</td>
</tr>
<tr>
<td>Colfax</td>
<td>Springer Elec Coop</td>
<td>$0.131</td>
<td>$0.098</td>
<td>$158</td>
</tr>
<tr>
<td>Colfax</td>
<td>PNM** (Raton &amp; Springer Munis)</td>
<td>$0.094</td>
<td>$0.058</td>
<td>$-</td>
</tr>
<tr>
<td>Curry</td>
<td>Farmers Electric Coop Inc</td>
<td>$0.087</td>
<td>$0.072</td>
<td>$97</td>
</tr>
<tr>
<td>Curry</td>
<td>SPS (Clovis)</td>
<td>$0.058</td>
<td>$0.053</td>
<td>$41</td>
</tr>
<tr>
<td>DeBaca</td>
<td>Farmers Electric Coop Inc</td>
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<td>$0.072</td>
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<tr>
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<td>EPE</td>
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<td>$0.053</td>
<td>$326</td>
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<td>Eddy</td>
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<td>$163</td>
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<tr>
<td>Eddy</td>
<td>SPS (Artesia)</td>
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<td>$0.053</td>
<td>$41</td>
</tr>
<tr>
<td>Grant</td>
<td>TNP (Silver City)</td>
<td>$0.085</td>
<td>$0.061</td>
<td>$131</td>
</tr>
<tr>
<td>Guadalupe</td>
<td>Cent NM (west) [or Farmers (east)]</td>
<td>$0.124</td>
<td>$0.086</td>
<td>$218</td>
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<td>Harding</td>
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<td>$272</td>
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</tr>
<tr>
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<tr>
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<td>$0.095</td>
<td>$191</td>
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<tr>
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<tr>
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<td>$0.064</td>
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<tr>
<td>McKinley</td>
<td>PNM** (Gallup Muni)</td>
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<td>$0.058</td>
<td>$-</td>
</tr>
<tr>
<td>Mora</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
<td>Sandoval</td>
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<tr>
<td>Sierra</td>
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