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ENRON CAPITAL & TRADE
RESOURCES
WORLDWIDE ENERGY SOLUTIONS

June 27, 1996

Arizona Corporation Commission
DOCKETED

JUN 28 1996

Mr. David Berry
Chief of Economics & Research
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

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Dear Mr. Berry:

Enclosed please find one original and 11 copies of Enron Capital & Trade Resources' ("ECT") response to the Commission's Request for Comments on the Arizona Electric Industry Restructuring (Docket No. U-0000-94-165).

ECT appreciates the opportunity to provide the Commission with our views on electric industry restructuring. ECT looks forward to working with the Commission and other interested parties on this issue. Please call me at (713) 853-3407 with any other questions.

Respectfully,

Richard S. Shapiro /ML

Richard S. Shapiro
Director, Governmental Affairs

Enclosure

ARIZONA CORPORATION COMMISSION

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Request for Comments on
Electric Industry Restructuring

Arizona Corporation Commission
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Docket No. U-0000-94-165

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COMMENTS OF ENRON CAPITAL AND TRADE RESOURCES

Enron Capital and Resources ("ECT") respectfully submits the following comments in response to the Corporation Commission's investigation of electric industry restructuring.

I. INTRODUCTION

ECT is the merchant arm of Enron Corporation and the leading marketer of gas and electric power in North America. ECT and its subsidiaries provide a broad range of products and services related to the purchase, sale and delivery of electric power and the management of associated price risks. ECT intends to market actively its electric power services and products in Arizona to customers of all sizes, including residential customers. ECT expects to play a significant and lasting role in Arizona's retail electric services market.

II. INTRODUCING RETAIL COMPETITION

We recommend that the Arizona Corporation Commission ("Commission") implement full competition as expeditiously as possible, with full divestiture of vertically integrated utilities' generation, transmission and distribution assets. This will provide the greatest benefits to all consumers of electricity.

ECT's experience with deregulation in other industries has confirmed that full and fair competition results in lower costs, greater efficiencies and better service. A competitive electricity market in Arizona, free of unnecessary regulatory restrictions on the opportunities to meet the varied and changing needs of electric consumers, will produce substantial cost savings

and demonstrable consumer benefits. The sooner Arizona moves to a restructured electric industry, and the more open the resulting market, the larger the benefits for everyone -- market participants, consumers, and the state as a whole.

To establish a competitive market, vertically integrated utilities must be unbundled. This requires the separation of transmission and distribution from any merchant activities.

Transmission and distribution must be operated in a non-discriminatory manner. For a competitive electricity market to develop, every supplier must have an equal opportunity to use the transmission and distribution systems to deliver electricity to customers.

To ensure that a competitive market develops through non-discriminatory access to transmission and distribution, generation functions should be separated from distribution and transmission functions, as has been done in other industries.¹ To achieve an efficient market, there must be multiple suppliers of power competing with one another. The most effective way to accomplish this is to auction-off generation assets or an acceptable surrogate, such as spinning off generating assets through a stock offering. This approach offers the most effective way to resolve the stranded cost issue. The market would establish a fair price for comparison to the net book value. Any other attempt to quantify stranded costs may result in litigation, delay and, at the very least, administratively burdensome true-up and review proceedings.

Competing sellers must have nondiscriminatory access to the essential facilities necessary to service all potential customers, which is critical to achieving effective retail choice. It must be

¹ This can be compared to the break-up of AT&T. Before deregulation, AT&T provided long-distance service and owned the telephone wires connecting individual homes. Deregulation separated the long-distance company from the local companies that own the local telephone wires and provide local services such as local telephone calls, metering, and new service, similar to the distribution function. Forcing AT&T to compete on an equal footing with other suppliers created the competitive market which gave consumers significantly lower long-distance charges.

as administratively convenient for a consumer to choose an alternative supplier as it is to remain with the existing utility or its affiliate. At a minimum, the regulatory framework must ensure that a generating utility gains no advantage from any continuing affiliation with the ownership or operation of the remaining monopoly functions of transmission and distribution. A more comprehensive and effective regulatory response to market power and self-dealing concerns can be found in solutions that embrace the corporate, rather than just functional, separation of generation from the transmission and distribution functions. ECT recommends this approach because, while functional unbundling within the same corporate family is a step in the right direction, the full benefits of competition will not be realized unless the necessary structural changes are undertaken to ensure that the utilities are not able to use their incumbent status and market power to prevent meaningful customer choice.

ECT believes that the unmistakable benefits of a restructured electric market will be maximized only if consumers have meaningful choices which are made available quickly. A competitive market requires an unbundled corporate structure for existing utilities, nondiscriminatory access to transmission and distribution, unbiased valuation and recovery mechanisms for transition costs, full and equal access to consumers and parity of environmental requirements. Delay in developing a competitive electricity market simply compels consumers to continue paying unnecessarily high rates for a limited selection of options to meet their electricity needs.

III. MEASURING THE OBJECTIVES

The Commission's objectives for electricity restructuring include both benefits and concerns about competition. The best way to confirm the benefits and alleviate the concerns is to look at the results of competition in other industries. The attached article, *Regulatory Reform in Electricity: Precedents from Other Industries*, elaborates on the benefits of competition in other industries and analogizes them to the electricity industry. Once consumers are given a choice, the benefits of a truly competitive electricity market will be apparent from cost reductions and enhanced services and product choices.

Comparison to other industries also demonstrates that fears about competition are unfounded. In fact, deregulation will result in improved reliability, as it has in other deregulated industries. For example, prior to deregulation, the natural gas industry lurched from surplus to shortage due primarily to imperfect resource decisions made under the auspices of regulatory assessment. Today the natural gas market no longer faces regulatory-driven imbalances as consumers better signal their needs through the marketplace.

IV. IMPLEMENTING A PILOT PROGRAM

ECT recommends immediate direct access for all Arizona consumers rather than a pilot program for several reasons. First, it is unfair to allow a select few consumers to have the benefits of competition and others to be limited to a monopoly provider. Second, a competitive market only realizes gains in efficiency where there is true competition. The pilot, at the very least, would have to be broad enough both in customer size and location to achieve the benefits of competition and to provide meaningful results, i.e., at least twenty percent of every customer class. Most significantly, a pilot is unnecessary and will result in delay. The benefits of

competition are clear from other industries and additional time to prepare is not necessary. In addition, pilots are ongoing in other states and any lessons to be learned from pilots can be drawn from the experience of those pilots.

If the Commission does decide to implement a pilot program, ECT makes the following recommendations:

A1. Affected Utilities. Which utilities should open their markets to competition?

All Arizona jurisdictional utilities should be included in the pilot program. Additionally, it should be large enough to encourage as many new suppliers as possible to enter the market. We recommend at least twenty percent of all customer classes be eligible for the pilot.

A2. Scope of Restructuring.

a. How much of the utilities' markets should be opened to competition?

b. Which consumers should be allowed to shop around for power and energy? Consider both geographic areas and consumer classes.

As much of the utilities' markets as possible should be open to competition, including all geographic areas and customer classes. To be an effective test of competition, there must be multiple buyers and sellers. Based on New Hampshire's recent experience, the presence of multiple sellers is not likely to be an issue as some thirty competitive suppliers are participating in that pilot. In addition, the larger the pilot program, the easier the transition will be to full competition.

c. Should utility customers served under existing contracts be eligible to participate in the competitive market prior to expiration of the existing contracts?

This issue is crucial to electricity deregulation for two reasons. First, fairness dictates that consumers should not be bound by a contract they were in essence, coerced to sign with their monopoly supplier. Deregulation represents a significant change of circumstances and holding

consumers to these contracts, which are vestiges of a monopoly environment, would be unfair. Customers that have entered into contracts with an electric utility for terms extending beyond the implementation of retail access must be given the option of converting existing sales service into transmission and distribution service. Utilities are now able to secure commitments to long-term contracts through unbridled exercise of monopoly market power. With retail access, the Commission must give these customers a choice to take transmission and distribution service in lieu of full bundled sales service notwithstanding previous arrangements.

d. If divestiture were undertaken, how should it be accomplished?

See response to question A9, stranded costs.

A3. Term of Restructuring

a. When should competition start?

Competition should start immediately. Delay only harms consumers.

b. If competition is in the form of a pilot or phase-in, how long should the pilot or phases run? Please describe the phases of phase-in. Please consider that many larger customers of utilities are currently under contract and may not be able to shop around until those contracts expire.

If competition is in the form of a pilot, it should be short, perhaps six months, with clearly defined start and end dates. Advance information about participants must be available so products can be developed before the pilot begins. Additionally, issues such as who will do the billing and what standards of conduct will apply to utility affiliates participating as suppliers in the pilot must be resolved in advance.

ECT does not recommend a phase-in. There is no reason to give any one customer class preferential access to competitively priced electricity. As discussed in question A2(c), customers

under long-term supply contracts with their monopoly provider should also be allowed to modify their contracts.

c. If competition is in the form of a pilot, how can the term of the pilot be set so as to avoid discouraging long term contracts signed under the pilot?

ECT recommends a pilot of short duration, on the order of six months. With this duration, there is no need to be concerned about discouraging long term contracts.

A4. Services Available on a Competitive Basis. Which services should be available in a competitive market?

- Distributed energy services at market based rates (serving multiple consumers located in proximity, and not requiring transmission service from others); this is distinct from on-site self generation for just one consumer.*
- Central station generation services at market based rates (generation serving one or more consumers located at a distance from consumers and requiring transmission service).*
- Other services described in Sections A5, A6, A7, and A8.*
- Other services (please describe).*

A5. Necessary Services. Utilities and perhaps other parties will have to address the services listed below. Please indicate how these services should be offered, measured (metered), and priced on an unbundled basis.

- distribution service*
- transmission service*
- supplemental generation service*
- imbalance service (including accounting for losses)*
- back-up (standby) service*
- voltage control*
- other ancillary services necessary for maintaining system reliability*
- scheduling of supplies and demands*
- repairs/consumer complaints*
- other necessary services - please describe*

A6. Market Center Services. The market may benefit from the services listed below. Please indicate how these services should be offered and priced.

- title transfer*
- transaction confirmation*
- establishing credit standards*
- invoicing*
- dispatching of transmission/generation*
- exchanges/swaps*
- interruption notification*
- imbalance trades*

In a deregulated electricity market, transmission and distribution will still be a monopoly function, regulated respectively by the FERC and the Arizona Commerce Commission. The transmission operator will have on file a transmission tariff with the FERC and the distribution owner will file a distribution tariff with the Commission.

The market will be the main regulator of what non-monopoly services will be provided and how they will be priced, including generation, necessary, and market center services. When the Commission establishes a competitive market, the market will provide the services consumers want and need. Consumers and suppliers will work together to decide what services should be offered and the market will decide the appropriate price.

For example, generation will no longer be a monopoly function. Generation services will not require regulation and will be offered at competitive prices determined by the market, as will market center services. In comparison, the transmission provider will be responsible for supplying necessary services to transmission users at prices specified in the tariff.

A7. Spot Market Services. The market may benefit from the services listed below. Please indicate how these services should be offered and priced.

- electronic bulletin boards for spot transactions/prices*
- power pooling services*
- coordination with futures/options markets*

The market will develop spot and futures markets for electricity on its own, as it has for other commodities such as natural gas. NYMEX is already trading electricity futures. There is no need for regulatory intervention. Nor is there a need for a government mandated power pool. A power pool limits the ability to manage risk by limiting sales to the spot or hourly market, denying consumers the risk reducing benefits of forward and fixed price contracts.

Requiring all electricity to flow through a mandated pool would also limit customized options. One of the advantages of a market-based approach is the flexibility to provide the customer with any type of service the customer needs. If the pool is actually selling the power, there will be unnecessary limits on the options available to consumers. For example, risk management products are tools that customers can use to manage the variability of prices and “lock in” acceptable long-term energy costs. These products can be bundled with the purchase of a commodity, such as the sale of power at a predetermined fixed rate, or they can be purchased separately, by purchasing the necessary financial tools to construct a hedge. Hedging can be more economic and is much more flexible than fixed price contracts. For example, an aluminum smelter can tie its costs of power to the price of aluminum, in effect, locking in a profit margin. The ability to manage price risk is one of the principal advantages in restructuring the electric services industry. Today, price risk is simply passed on to the ratepayer, without any means to manage this risk. A completely open market will give consumers access to all the options that purchasers of other commodities have.

A8. Transmission Service. For a competitive market to work, utilities owning transmission facilities must provide transmission service. Please indicate how the following objectives would be met:

- services must be provided consistent with FERC tariffs.*
- utilities must accept power delivered to their transmission systems by other suppliers and offer wheeling services comparable to services they provide to themselves.*
- all sellers supplying consumers must have interconnection agreements with owners of necessary transmission facilities.*

FERC Order 888 mandates open access to the transmission system with comparable treatment for all users, implemented by requiring the filing of a transmission tariff specifying the

unbundled prices for wholesale transmission.² These tariffs can be easily extended to distribution services which would facilitate the supply of electricity to consumers.

A9. Recovery of Stranded Investment. Please indicate how the recovery (if any) of stranded investment should be accomplished. Address each of the following issues:

a. The definition of stranded investment.

Stranded investments are assets whose net book value exceeds their market value when the transformation is made to a competitive electric services market. There may be also stranded benefits, if the market value of certain assets exceeds their net book value.

b. The fraction of stranded investment which should be recovered.

While ECT advocates that the Commission apply an appropriate and balanced test to the issue of stranded cost recovery, ECT would suggest that in order to achieve full and appropriate mitigation, stranded investment recovery arguably should be less than 100%. In order to make a stranded investment claimant take an economic interest in mitigating the magnitude of what remains uneconomic in the long-term, the claimant must be made to share in the risk of stranded investment recovery. ECT is aware of no way to achieve this result other than by limiting the amount of stranded investment recovery to some percentage less than 100%. Once recovery is capped at less than 100%, there will be a proliferation of market-oriented proposals for lessening stranded investment exposure.

² *Promoting Wholesale Competition through Open-Access Nondiscriminatory Transmission Services by Public Utilities and Recovery of Stranded Costs by Public Utilities and Transmitting Utilities*, Order No. 888, 61 Fed. Reg. 21,540 (1996).

c. How the Commission will determine the amount of stranded investment, taking into account: revenues under traditional tariffed rates (or existing special contracts); actual utility revenues from customers who obtain discounted rates or obtain service from others; increases in net revenues from wholesale sales and additional retail sales, including the effects of price elasticity of demand; increases in the value of assets due to new pricing or competition; mitigation of stranded investment; and other relevant factors.

Recognizing that most utilities have a mix of power supply resources, including multiple generating stations and purchase power agreements, it would be inequitable to permit a utility to seek stranded investment recovery for selected uneconomic investments, without netting the cost of those stranded investments against other resources in which sunk accounting costs are at or below replacement cost. Indeed, an approach that fails to net "economic" investments against the "uneconomic" resources, if pursued in tandem with deregulation of the price of power from existing rate-based generating units, would thrust utility customers into the worst of all possible worlds. In that world, charges for low-cost resources would increase from cost-based levels to market prices while rates for stranded investments would be set at embedded cost levels in excess of market prices. As a result, ratepayers would be required to pay the *higher of* cost or market prices.

To ensure that departing utility customers are not denied credit for the utility's economic investments, but saddled with only uneconomic investment costs, a divestiture incentive must attach itself equally to uneconomic and economic assets. For example, once a utility determines that it has uneconomic investments for which it will seek recovery through a stranded investment charge, then the Commission should require the utility to file evidence of its total system sunk accounting costs together with a plan to sell all of its resources. The Commission would then have a base for calculating whatever recovery is allowed.

d. Preliminary estimates of the magnitude of stranded investment (please provide supporting analyses).

It is difficult to calculate accurately the magnitude of stranded investment. There is, however, a market for generation assets so the costs could be calculated accurately through an auction or some other type of market valuation mechanism.

e. The proper ratemaking treatment of negative stranded investment.

No response.

f. From whom stranded investment should be recovered.

Any such recovery must be from all system users through a broad-based access charge. Exit and entry fees should be rejected as they will inhibit competition by discouraging customers from changing providers.

g. The mechanism for recovery of stranded investment.

Any mechanism which allows recovery from all system users would be acceptable. For example, each system user could be charged an access or connection fee indexed to usage levels. Whatever the mechanism, it must not create incentives or disincentives for customers to change providers.

h. The time period over which stranded investment is to be recovered.

The time period for recovery of stranded assets should be as short as possible. A true competitive market, free of the vestiges of historical decisions, should be developed as soon as possible.

i. How utilities can mitigate stranded investment.

Utilities can mitigate consumer exposure to stranded investments by selling the asset at market prices, as previously discussed.

A10. Recovery of Costs of Commission-Mandated Utility Low Income, DSM, Environmental, Renewables, and Nuclear Power Plant Decommissioning Programs ("Mandated Programs").

- a. *How shall costs of mandated programs be recovered from participants in the competitive environment?*
- b. *How shall the magnitude of the costs of mandated programs be determined?*

Whether developing these programs or retaining existing programs, the Commission should use two principles: parity and efficiency. Parity is essential because if all providers are not treated the same, the market will not achieve the maximum efficiencies from competition.

The Commission should adopt the most efficient method to achieve each policy goal. In some cases, this may mean setting the policy goal and allowing each participant to decide the most efficient way to reach that goal. For example, if the Commission wanted to limit air pollution, tradable permits could be used to let each firm decide whether it could best reduce pollution by installing scrubbers, closing the facility and buying power on the market, or any other option. In other cases, the most efficient solution might be an access charge on all electricity bills collected to fund specific programs.

A11. Encouragement of Renewables

- a. *How shall Renewables be encouraged in a competitive environment? Please discuss such mechanisms as a requirement that x percent of energy sold in the competitive market must come from solar resources.*
- b. *How could progress in encouraging renewables be measured?*
- c. *How could a renewables program be enforced by the Commission?*

A competitive electricity market will not impede the use of renewable resources. It will simply make the costs of renewable resources more transparent. Without any action by the Commission, any customer who is willing to pay the costs of renewable resources will find a seller in the marketplace willing to meet their needs. If individual customers are not willing to pay the premium for renewables resources, but the public is, then the legislature or the Commission can

subsidize the costs of using renewable resources. The subsidy level can be set to achieve whatever use of renewables the public desires. The subsidy could be paid for by either general revenue funds or a broad-based access charge on all customers. As long as all electricity consumers have equal obligations, these programs can be implemented without distorting the competitive market.

ECT would discourage the use of a fixed percentage renewable resource requirement because it is inefficient. Such a requirement would increase the costs of electricity by including the higher cost of renewable sources *and* the cost of tracking all electrons that are sold to make sure the requirement is met. In a competitive market generators and suppliers of power will manage increasingly complex portfolios of power which will adjust constantly to reflect the needs of the market. Both utilities as well as competitive suppliers will buy or sell power with relatively short notice if price movements make such transactions advantageous. There is no need to impose a costly system of tracking "renewable electrons" through the system to make sure the requirement is being met. Also, under a fixed percentage system, the additional costs of using renewable resources would be hidden, making a true representation of the level of the public's desire to use renewable resources difficult to achieve.

A12. Pooling of Generation and Centralized Dispatch of Generation or Transmission

a. Should pooling of generation or centralized dispatch of generation or transmission be mandatory or voluntary?

b. What technical requirements will be necessary to ensure reliable and efficient use of generation and transmission resources? Please propose specific requirements, if possible.

ECT strongly discourages the use of a pool or centralized dispatch because it limits the products available to customers, particularly the ability to manage risk. (See also response to question A7).

A13. Non-Public Service Corporations. How shall non-public service corporations such as municipal utilities be involved in a competitive market? For example, the service territories of Arizona utilities not regulated by the Commission may not be open to competition and Arizona utilities not regulated by the Commission may not be able to compete for sales in the service territories of the utilities identified in Section A1. Alternatively, an Arizona utility not regulated by the Commission may voluntarily participate in a competitive program if it makes its service territory available to competing sellers and if it agrees to all of the requirements of the Commission's competitive program.

The most efficient competitive market is one in which all buyers and sellers participate. Consequently, the Commission should encourage non-public service corporations to be involved in a competitive market. This might be accomplished through reciprocity requirements. For example, the Commission could require that in order for a municipal utility to sell electricity to customers traditionally served by a Commission regulated utility, the non-regulated utility must allow other utilities the right to compete for its customers on a comparable basis.

A14. Conditions for Returning to Utility Service After the Conclusion of a Pilot Program. If a pilot were adopted, please indicate what conditions are appropriate for returning to utility service after the conclusion of the pilot.

ECT presumes that a fully competitive market will follow the completion of a pilot. As a result, it would appear that the more appropriate issue is whether the utility should even be in the generation/retail service function. Whether functional or corporate unbundling is adopted by this Commission, the distribution company should no longer be engaged in these functions.

A15. Conditions for Returning to Utility Service. Please indicate what conditions (if any) are appropriate for returning to utility service if a competitive market is on-going.

Assuming the Commission recommends full competition at the conclusion of a pilot program, those customers who participated in the pilot program should have all of the options that are available to other customers, including the selection of standard offer providers.³

³ ECT supports the concept of Basic Service for those customers who choose not to choose and recommends allowing licensed Basic Service suppliers to serve these customers. Customers who do not choose a (cont.)

A16. Administrative Requirements.

a. A utility may require consumers obtaining generation from another entity to adhere to reasonable scheduling notification requirements, accept reasonable delivery points, adhere to reasonable metering requirements, and accept reasonable remote control requirements for interruptions or other purposes. Please specify what you consider to be reasonable.

The FERC *pro forma* open-access transmission tariff, which incorporated substantial industry input, should be used as a template for these requirements.⁴

b. How should the utilities identified in Section A1 notify their customers of the adoption of a competitive program by the Commission?

Any customers eligible for a pilot program should be required to complete an election form, designating their desired provider. Alternative providers should be given access to essential customer information about pilot participants possessed by the utilities and essential customer interfaces such as billing inserts.

A17. Impact on Other Utility Customers. Please indicate how adverse impacts on rates or service quality for utility customers not participating in the competitive market could be minimized.

A pilot program will not adversely affect the rates or service quality of customers not allowed to participate, other than fencing them off from the benefits of a competitive market place.

A18. Reporting Requirements for All Sellers of Electricity to End Users. Please indicate what reporting requirements (to the Commission) are appropriate and who should file reports.

ECT would not be opposed to reasonable reporting requirements specifying aggregate numbers of customers and aggregate volumes sold. More detailed, customer-specific information, if required, would be proprietary and require confidentiality protection.

provider should be either equitably allocated or bid for among vendors who have proven to the Commission that they are capable, both financially and operationally, to provide the minimum service required by Basic Service customers. This will ensure that all customers benefit from competition.

⁴ Order No. 888, 61 Fed. Reg. at 21,712, 21,713.

A19. Certificates of Convenience and Necessity. Please comment on whether competitive sellers who supply electricity to an end user must obtain a Certificate of Convenience and Necessity from the Commission (unless the seller already has an applicable Certificate). Please describe whether any conditions on the certificate would be necessary.

The Commission should only impose reasonable registration requirements on competitive suppliers of generation and retail services that are geared toward identifying the creditworthiness of the suppliers and their technical ability to buy and sell electricity effectively in Arizona.

CONCLUSION

ECT anticipates being an active participant in the future of Arizona's competitive electric power industry and respectfully urges the Commission to move forward with the introduction of retail electric power competition and universal customer choice as proposed in the foregoing comments.

Respectfully submitted,

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Regulatory Reform in Electricity:
Precedents from Other Industries

By Jerry Ellig, Ph.D.

November 4, 1994

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REGULATORY REFORM IN ELECTRICITY:
PRECEDENTS FROM OTHER INDUSTRIES

Is it possible to use the experience of regulatory reform in other industries as a guide in the electric industry? The experience with competition in the gas, telecommunications, airline, railroad, and trucking industries holds significant implications for electricity. In each case, service providers found themselves subject to enhanced competition as a result of regulatory reform during the past two decades. And in each case, competition resulted in lower prices, expanded output, and improved quality. The experience of these industries with respect to price levels, price structure, quantity, quality, and open access belies the critics' predictions that deregulation would lead to disaster.

NATURAL GAS

Like the electric industry, the gas industry includes competitive producers who transport their product through a network. Pipelines, like electric grids, are similar to a tub that various parties alternately fill and draw from. A gas shipper is like a person who pours an agreed-upon amount of water into the tub at one end. The buyer draws the agreed-upon amount out at the other end, but the buyer does not necessarily receive the same molecules that the shipper put in. The modern gas market involves bilateral contracts between buyers and sellers, yet the molecules of gas withdrawn from the pipeline by a buyer

need not be the same molecules placed in the pipeline by the seller.

Price Level

The Natural Gas Policy Act of 1978 deregulated wellhead gas sales in stages. By 1985, all gas but that discovered before 1976 was free from federal price regulations. Critics of deregulation predicted that gas prices would "fly up" once the last controls on recently-discovered gas were lifted in 1985. In the following years, however, both wellhead and end user gas prices declined precipitously. In constant (1988) dollars, wellhead prices fell from \$3.03 per thousand cubic feet in 1984 to \$1.57 in 1990, a 48 percent reduction. As the following table shows, the average real price to end-users fell from \$5.52 in 1984 to \$4.18 in 1990, a 24 percent reduction.

REAL GAS PRICES (1988 dollars per thousand cubic feet)¹

| | Wellhead | End-user |
|------|----------|----------|
| 1984 | \$3.03 | \$5.52 |
| 1985 | 2.76 | 5.19 |
| 1986 | 2.09 | 4.46 |
| 1987 | 1.74 | 4.22 |
| 1988 | 1.69 | 4.09 |
| 1989 | 1.62 | 4.32 |
| 1990 | 1.57 | 4.18 |

¹Figures in this and following table are from Jerry Ellig, "The Consumer Impact of Federal Natural Gas Regulation," 60 Transportation Practitioners J. 275 (Spring 1993). Calculations are based on figures supplied by the American Gas Association.

Price Structure

All major consumer groups benefitted from these price reductions, as the following table shows. In each year, almost all customers experienced price reductions; the main exception is the minimal increases seen by industrial customers and electric utilities in 1989.

REAL GAS PRICES FOR END-USERS (1988 dollars per thousand cubic feet)

| | Residential | Commercial | Industrial | Elec. Utility |
|------|-------------|------------|------------|---------------|
| 1984 | \$6.97 | \$6.32 | \$4.80 | \$4.21 |
| 1985 | 6.73 | 6.05 | 4.34 | 3.90 |
| 1986 | 6.29 | 5.48 | 3.48 | 2.62 |
| 1987 | 5.77 | 4.97 | 3.06 | 2.42 |
| 1988 | 5.47 | 4.63 | 2.95 | 2.34 |
| 1989 | 5.23 | 4.58 | 3.04 | 2.58 |
| 1990 | 5.09 | 4.40 | 2.90 | 2.41 |

During this period, average real residential rates fell by 27 percent; commercial rates fell by 30 percent; industrial rates fell by 40 percent; and electric utility rates fell by 43 percent. It is true that large customers saw relatively larger price decreases, but a 27 percent real reduction for residential customers is nothing to complain about. All gas consumers benefitted substantially from wellhead deregulation.

Quantity

Not surprisingly, increased gas consumption has accompanied lower prices. Between 1984 and 1990, the total of interstate and intrastate gas consumption increased by 4.5 percent, from 17.9

billion cubic feet to 18.7 billion cubic feet. The effect on interstate gas markets has been similar; consumption rose by the same percentage, from 11.3 billion cubic feet in 1984 to 11.8 billion cubic feet in 1990.²

Quality

Deregulation improved the quality of gas service. In fact, it would not be an exaggeration to say that quality issues created the crisis that led to deregulation. During the 1960s and 1970s, federal regulators controlled the wellhead price of gas for the express purpose of transferring wealth from gas producers to gas consumers.³ In practice, federal policy created massive shortages -- first in the interstate market for gas reserves, and then in the market for gas production. Stephen Breyer and Paul MacAvoy estimated that the harm the shortages inflicted on residential gas consumers actually exceeded the value of any price reductions they initially received!⁴ During the mid-1970s, factories and schools closed as pipelines curtailed gas service. Policymakers had to deregulate wellhead prices to prevent ever-growing shortages.

²U.S. Dept. of Energy, Natural Gas Monthly (Sept. 1993).

³Edmund Kitch, "Regulation of the Field Market for Natural Gas by the Federal Power Commission," 11 J. of Law & Econ. 243 (1968).

⁴Stephen Breyer and Paul MacAvoy, Energy Regulation by the Federal Power Commission (1974).

Since deregulation, gas shortages have been virtually nonexistent. Where gas shortages have occurred, they have resulted either from extremely cold weather (which would tax any pipeline system) or shortages of pipeline capacity created by federal or state regulation. California, for example, experienced several gas service curtailments during the mid-1980s because there was not enough interstate pipeline capacity serving the state. At the same time, the California Public Utilities Commission and the state's two largest utilities were urging FERC to prevent the construction of new interstate capacity, because they feared that the new pipelines would compete with the California utilities for large industrial customers. Regulation, not deregulation, created these shortages.⁵

Open Access

FERC Orders 436 and 500 completed the transformation of interstate pipelines from integrated gas merchants to providers of transportation. Pipelines may still participate in the merchant and gas sales business through affiliates, but the pipeline transmission function is now a separate entity with its own sets of accounts. Opponents of open access expressed fears that separating the merchant from the transportation function would hamper reliability of the pipeline system. The unusually cold winter of 1993-94 was perhaps the most severe test of this

⁵See Jerry Ellig, "Why Do Regulators Regulate? The Case of the California Gas Market," *Journal of Regulatory Economics*, forthcoming.

system, but there was nary a reliability problem to be found. Electric transmission may possess some of its own unique technological challenges, but the gas industry's experience suggests that open access systems may be more reliable than many people previously thought.

TELECOMMUNICATIONS

Like the electric industry, telecommunications involves the transmission of electrons over wires. At the present time, local telephone companies are economically similar to local electric companies. Local phone companies usually enjoy a statutory monopoly on the sale of local phone service and on the "transportation" of long distance calls from the originator to the long distance carrier and from the long distance carrier to the receiver. In other words, the person who dials a long-distance number can be said to "ship" a phone call over the local phone lines to the long distance carrier. Like the gas industry, the telecommunications industry uses a form of bilateral contracting; each phone subscriber gets to choose a long distance company. Each phone number has a "primary" long-distance carrier, but by dialing a few more digits, the user can even bypass his or her chosen primary carrier.

Competition in long-distance service came in stages. During the late 1950s, the FCC began to permit competition in private microwave service. In the late 1960s and early 1970s, federal

regulators permitted competition in private-line common carriage. MCI opened the floodgates to competition in 1974, when it began offering switched-voice message service, the ordinary long distance service that accounted for more than 90 percent of AT&T's long distance revenues. The federal courts refused to uphold the FCC's efforts to relegate MCI to private-line service, effectively opening the long distance market to competition.⁶

Price Level

Long distance competition dramatically lowered rates for long distance phone calls. Between 1976 and 1980, real rates for ordinary long distance service fell by an average of 6.5 percent annually, compared to a real annual decrease of about 3 percent between 1970 and 1976. The rate of decrease flattened somewhat between 1980 and 1983, then averaged 9.1 percent annually between 1983 and 1989. Competition also accelerated the reduction in WATS and private-line rates.⁷

A cross-state comparison also suggests that less extensive price regulation can significantly lower long-distance prices. Between 1984 and 1987, 28 states relaxed their regulation of AT&T's intrastate, long-distance phone rates. Many abandoned rate of return regulation in favor of zone-of-reasonableness

⁶See MCI Telecommunications Corp. v. Federal Communications Commission, 561 F 2d 365 (D.C. Cir. 1977).

⁷Robert Crandall, After the Breakup: US Telecommunications in a More Competitive Era (1991) at 56-59.

rates. A 1989 study found that price flexibility reduced the price of a five-minute daytime call by between 7 and 12 percent, reduced the price of a five-minute evening call by between 10 and 19 percent, and reduced the price of a five-minute night/weekend call by between 10 and 22 percent.⁸

Price Structure

Relative prices are a controversial policy issue in telecommunications. The main controversy is not over prices for different groups of long distance customers, but rather over long distance vs. local rates. For years, federal and state regulators kept long distance rates artificially high in order to subsidize universal local phone service. Long distance competition forced AT&T to begin repricing local and long distance service in the 1980s. In 1985, the Federal Communications Commission initiated a "federal subscriber line charge" that partially offsets the subsidy to local service.

Real local rates rose temporarily as a result of this policy. Between 1980 and 1987, real local rates rose by an average of 5.5 percent annually. Between 1987 and 1989, they fell by 4 percent, despite rising federal subscriber line charges.⁹

⁸A.D. Mathios and R.P. Rogers, "The Impact of Alternative Forms of State Regulation of AT&T on Direct-Dial, Long-Distance Telephone Rates," 20 RAND J. of Econ 437 (Autumn 1989).

⁹Crandall, *After the Breakup*, at 61.

Although local phone rates rose somewhat, three caveats are in order. First, the slight increase does not seem to threaten the policy goal of universal service. Robert Crandall, an economist at the Brookings Institution, statistically estimated the effect of local service repricing on telephone subscription levels. Repricing had virtually no effect on subscription levels for upper- and middle-income households. For households with incomes below \$10,000, "the increase in the price of local access and usage in the early 1980s probably reduced telephone subscription...by about 3 percentage points."¹⁰ Approximately 93 percent of American households have phone service, and this number continues to grow.¹¹

Second, the types of price data reported here must be interpreted with great care. Most people buy both local and long distance service, and they pay for business phone service indirectly in the prices of goods and services that they buy. As a result, the only person who we can say has been unambiguously hurt by long distance competition is a recluse who purchases only local phone service and very few other goods and services -- truly a rare individual. Unfortunately, policy debates in industries like telecommunications and electricity frequently focus only on the most visible price effects, ignoring the fact that consumers ultimately pay the costs incurred by businesses.

¹⁰Crandall, After the Breakup, at 110-11.

¹¹Crandall, After the Breakup, at 117.

This is a shortsighted view. In considering whether to promote competition in electric generation, regulators should keep in mind that reductions in electric bills for large industrial customers will redound to the benefit of consumers who purchase the goods and services that these businesses provide. The more widespread is competition in generation, the more likely it is that a given business will be forced by competitive pressures to pass its electricity cost savings through to its customers.

Third, the policy of suppressing local phone rates to secure universal service engenders significant social costs. Price controls transfer \$6.9 billion annually among different groups of telecommunications customers. Other programs, such as the Universal Service Fund and National Exchange Carriers Association funds, transfer another \$1.6 billion. Consumers purchase \$500 million less worth of telecommunications services than they would if prices more accurately reflected market conditions. To make matters worse, many of the subsidies do not even reach low-income people. A poor, inner-city family that makes a few long-distance calls a month pays higher rates so that affluent resort communities like Bretton Woods, New Hampshire can receive cheaper local phone service.¹² The lesson for electric regulation should be clear: direct payments are much less costly -- and much more

¹²Wayne Leighton, "Universal Service Subsidies: Reach Out and Fund Someone," manuscript, George Mason University, August 1, 1994.

honest -- than are cross-subsidies that distort an entire price structure to lower the rates of captive or low-income customers.

Quantity

The quantity of telecommunications services bought has continued to rise since the introduction of long distance competition. Total output of telecommunications services rose by about 8 percent annually during the 1970s, 3 percent annually between 1980 and 1985, and more than 7 percent annually between 1986 and 1988. The gains in the latter years are all the more impressive because the figures no longer include "customer premises equipment," which the FCC detariffed in 1984.¹³

Quality

There is little or no evidence that the quality of telephone service has declined since the introduction of long distance competition. Crandall's study reports that service quality declined during the 1960s, then improved during the 1970s in response to investments in new equipment. The introduction of computerized switching and fiber optic cable further increased quality and reliability during the 1980s.¹⁴ If anything, long distance competition enhanced quality by spurring AT&T to invest in new plant to match that built by new competitors.

¹³Crandall, After the Breakup, at 45.

¹⁴Crandall, After the Breakup, at 121-22.

Open Access

Because local phone companies possess statutory monopolies, the Federal Communications Commission has promulgated detailed rules designed to ensure that long distance companies can use the local phone lines to access customers. Although local phone companies may contest aspects of these rules vigorously, they generally seem to accept the concept of "open access" in exchange for the right to enter markets that the 1982 AT&T consent decree prohibited them from entering, such as long distance. In addition, the telecommunications example illustrates that regulators can use accounting rules to separate local exchange facilities from others without destroying reliability of service. Local telephone companies simply use their equipment to route long-distance calls, and they collect access fees for doing so.

AIRLINES

Airlines share more similarities with the electric industry than may first meet the eye. The privately-owned airline companies are like independent power producers; they can serve customers in a wide variety of locations. To do so, however, they need access to government-owned airports and the air traffic control system, which are this industry's analogue to electric transmission lines and dispatchers.¹⁵ Contracting in this

¹⁵There is one notable difference that should not be material to the issues discussed here: the airports do not operate their own airlines. Thus, they are like electric

industry has always been bilateral, in the sense that specific individuals buy airline tickets. Tickets can be transferred only at great expense, when transfer is even possible.

Before 1978, airlines were subject to both maximum and minimum fares established by the Civil Aeronautics Board; the CAB also controlled entry on individual city-pair routes. In practice, regulation had the effect of creating a government-enforced cartel that artificially raised prices. The Airline Deregulation Act of 1978 deregulated fares and entry on individual routes, touching off an explosion of competition.

Price Level

Deregulation dramatically lowered fare levels. Between 1978 and 1992, the average fare per passenger mile fell by 30 percent after adjusting for inflation.¹⁶ Improved fuel economy and other technological changes deserve some of the credit, but airline deregulation saved consumers approximately \$10 billion annually, according to a study by Steven Morrison of Northeastern University and Clifford Winston of the Brookings Institution. About one-third of those savings are directly attributable to lower fares, while the remainder is due to more convenient

companies with no generating capacity, only transmission and distribution lines.

¹⁶Jerry Ellig and Wayne Winegarden, "Airline Policy and Consumer Welfare," *Transportation Practitioners Journal* (Summer 1994) at 412.

flights and shorter waiting times between flights.¹⁷ Virtually all reputable observers, including airline commissions established by President Clinton and President Bush, agree that deregulation dramatically lowered fares.¹⁸

Price Structure

Because air fares more closely reflect actual costs, not all passengers benefitted equally from price reductions. In general, those who received the most significant reductions were vacation travelers flying the longest distances. By purchasing advance tickets and flying at nonpeak times, vacation travelers can take advantage of discount fares. Today, 88 percent of passengers travel on discount fares (compared to 45 percent in 1978), and the average discount fare is 62 percent below the full coach fare.¹⁹

Deregulation raised some business travelers' fares, mostly on shorter and less heavily traveled routes. Business travelers on these flights pay higher fares than they did under regulation, but the higher fares are offset -- by a large margin -- by the

¹⁷Clifford Winston and Steven Morrison, "Less Congestion Requires Higher Fees," New York Times (Jan. 15, 1989) at F2; also see Steven Morrison and Clifford Winston, *The Economic Effects of Airline Deregulation* (1986).

¹⁸See *Change, Challenge, and Competition: Report of the National Commission to Ensure a Strong and Competitive Airline Industry* (Aug. 1993), and *Report of the Secretary's Task Force on Competition in the U.S. Domestic Airline Industry* (Feb. 1990).

¹⁹Air Transport Association, *Air Transport 1993: Annual Report of the U.S. Scheduled Airline Industry* (1993) at 8.

value of increased flight frequencies and reduced waiting time. The evidence shows that while vacation travelers got the largest fare reductions, business travelers actually received the largest benefits, once the value of their time is taken into account.²⁰

Price differentials between business and pleasure travelers have occasionally generated policy concerns. Business travelers pay higher fares, but as the President's Council on Competitiveness noted:

A careful analyst will always ask, "Higher than what?"

Assuming a competitive market, these seemingly "high" prices are lower than what the low-elasticity [business] travelers would have paid if other, high-elasticity [leisure] passengers were not brought into the market through generous discounts. By segmenting the market and offering discounts, airlines create a larger pool of travelers to share the costs of jets, fuel, and airport facilities, thus making all travelers better off.²¹

Some critics argue that deregulation has benefitted only travelers on routes with many airline competitors, at the expense of travelers on routes dominated by a single carrier. In reality, fares on single-carrier routes have fallen by 11-13 percent, while fares on multi-carrier routes have fallen by 24-30

²⁰Morrison and Winston, *The Economic Effects of Airline Deregulation* (1986).

²¹President's Council on Competitiveness, *The Legacy of Regulatory Reform* (Sept. 1992) at 7.

percent.²² Some travelers gained more than others, but average fares are lower on both types of routes.

Quantity

Deregulation vastly expanded air travel. In the early 1970s, half the U.S. population had never flown on an airplane before; by 1992, 76 percent had flown. The total number of airline passengers rose from 275 million in 1978 to 473 million in 1992, a 72 percent increase.²³

Quality

In some ways, deregulation improved the quality of airline service. Deregulation resulted in more frequent flights and more nonstop flights on the heavily-traveled routes; these changes saved time and improved passenger comfort. A study conducted at the MIT Sloan School of Management found that the number of nonstop flights available at peak times increased by 69 percent between 1977 and 1989.²⁴ In addition, the creation of nationwide route structures reduced the need to change airlines when changing planes. Remaining on the same airline often cuts the distance passengers have to walk to change planes, pares the time

²²President's Council on Competitiveness, *The Legacy of Regulatory Reform* (Sept. 1992) at 6.

²³Jerry Ellig and Wayne Winegarden, "A Consumer Perspective on Airline Policy," *CSE Foundation Economic Perspective* (Aug. 26, 1993) at 2.

²⁴Arnold Barnett, Todd Curtis, Jesse Goranson, and Andrew Patrick, "Better Than Ever: Nonstop Jet Service in an Era of Hubs and Spokes," *Sloan Management Review* (Winter 1992) at 53.

they have to wait for a connecting flight, and reduces the chance of lost luggage. In 1978, 27.8 percent of passengers changed airlines when changing planes; in 1992, only 4.7 percent changed airlines.²⁵

Statistics on consumer complaints also suggest that deregulation has improved quality. Between 1970 and 1992, the total number of complaints has waxed and waned; deregulation seems to have had no effect on the pattern. But since deregulation, nearly twice as many people are flying, suggesting that the number of complaints per passenger has dropped precipitously.²⁶

Safety statistics tell a similar story. Opponents of deregulation predicted that it would diminish safety by encouraging profit-conscious airlines to cut corners. In reality, the number of accidents, fatal accidents, and fatalities all declined under deregulation. During the eight years before deregulation, major U.S. airlines experienced an average of 33 accidents, 5 fatal accidents, and 182 fatalities annually. Between 1979 and 1987, the totals fell to 20 accidents, 3 fatal accidents, and 115 fatalities annually -- at the same time that

²⁵Figures calculated from U.S. Dept. of Transportation, Origin and Destination Survey.

²⁶U.S. Department of Transportation, Office of Consumer Affairs, Air Travel Consumer Reports (February 1993), Table 5, and Civil Aeronautics Board, "Airline Consumer Complaint Report for 1979" (Feb. 20, 1992).

the total number of passengers increased by 62 percent.²⁷ More sophisticated analyses have shown that deregulation either had no effect on safety, or it improved safety.²⁸

A few measures of quality may have declined under deregulation. Because airlines can now compete by cutting prices, they do not compete as vigorously on the quality or quantity of food, beverages, and other amenities. This phenomenon, however, suggests that observers must take great care when discussing the effects of competition on quality. After deregulation, any airline had a choice of keeping posh meals and high fares; few found this to be a winning combination in the competition for passengers. Passengers apparently preferred lower fares and fewer frills. It is thus misleading to point only to the reduction in frills as a reduction in quality. In reality, the quality of airline service now more nearly resembles the quality consumers are actually willing to purchase, given a free choice.

Similarly in the electric industry, regulators should demand solid proof before believing speculations and conjectures that competition will reduce quality or jeopardize service reliability. Anyone can tell a plausible-sounding story

²⁷Jonathan D. Ogur, Curtis L. Wagner, and Michael D. Vita, *The Deregulated Airline Industry: A Review of the Evidence* (1988) at 15.

²⁸For a survey see Virginia Stouffer, "Commercial Aviation Safety and Risk" (Jan. 1992).

suggesting that competitive firms might cut corners on quality, safety, or reliability. In the airline industry, the facts tell a different story.

Open Access

The publicly-owned facilities used by airlines also involve quality and reliability issues. To serve customers, an airline needs airports and an air traffic control system. The continuing problems with these aspects of the air transportation system suggest that regulators must tread carefully when they discuss pricing of the electric industry's analogues, transmission and distribution.

The principal problem with airports and air traffic control is congestion at peak travel times. This occurs because governmental owners of airports and air traffic control fail to charge prices that accurately reflect the cost and value of the services. Total revenues generally cover the total costs of the facilities, but massive misallocations result because the users do not pay accurate prices. Airports and air traffic control are financed out of a federal Aviation Trust Fund, generated by a percentage tax on airline tickets and fuel. As a result, scarce landing rights at peak times are allocated through a combination of negotiations and bureaucratic fiat instead of market pricing. In major airports across the nation, a corporate jet with three passengers may get to land at a peak time, even though the 300 passengers in a jumbo jet could easily outbid the corporate jet

for the landing rights. Morrison and Winston estimate that efficient pricing for landing slots, coupled with efficient expansion of airport capacity, would generate \$11 billion in benefits to air travelers, airports, and airlines.²⁹

The airline experience suggests that the pricing structure for electric transmission and distribution could significantly affect the performance of a competitive generation industry. Prices need to respond to the market demand for transmission, and they must give transmission owners the correct incentives to expand or reduce capacity. Prices that merely allow total revenues to cover total costs will not achieve this objective.

RAILROADS

Economically, a railroad is similar to a privately-owned electric firm with both generation and transmission. The railroad's generation capacity is its locomotives and freight cars; its transmission capacity is its track. Unlike airlines and trucking firms, railroads own and pay to maintain their own right-of-way.

By the 1970s, federal regulation had bankrupted many railroads. Railroads faced intensified competition from trucking firms, but had little ability to respond because the Interstate

²⁹Steven A. Morrison and Clifford Winston, "Enhancing the Performance of the Deregulated Air Transportation System," Brookings Papers on Economic Activity: Microeconomics (1989) at 93.

Commerce Commission mandated "value of service" pricing. In effect, this policy forced railroads to charge higher rates on "high-value" shipments of manufactured goods -- precisely the goods for which truckers were most suited to compete. In addition, outdated regulations intended to ensure near-universal rail service made it difficult for railroads to abandon service on unprofitable routes.

The Staggers Act of 1980 reversed decades of federal railroad policy. The Interstate Commerce Commission still reserves the right to regulate rates charged to "captive shippers," but rates on 90 percent of all rail traffic are now deregulated. A shipper's rates are deregulated if:

- o The railroad and shipper sign a bilateral contract,³⁰
- o Railroads generally face competition for the types of goods or shipments the shipper generates,
- o The railroad faces competition for that shipper's traffic, or
- o The shipper pays less than 180 percent of its incremental cost.

If a captive shipper challenges a rate, the ICC may still declare it reasonable -- and the ICC has often upheld a challenged rate

³⁰At least 60 percent of all rail-originated tonnage, and 85 percent of coal rail tonnage, moves under contract. See President's Council on Competitiveness, The Legacy of Regulatory Reform (Sept. 1992), at 12.

if the railroad was earning less than its cost of capital or the rate was below the shipper's stand-alone cost.

Price Level

Prior to the Staggers Act, rail rate increases frequently surpassed increases in consumer prices. Between 1971 and 1981, inflation-adjusted rail rates rose by an average of 2.1 percent. Deregulation changed this trend. Standard & Poor's estimated that real rail rates fell by an average of 1.5 percent annually between 1981 and 1987.³¹ A 1989 ICC study estimated that inflation-adjusted rail rates fell 22 percent between 1980 and 1987.³² By 1991, inflation-adjusted rail rates had fallen by 25 percent.³³ A Federal Trade Commission study calculated that deregulation saves shippers between \$3.5 billion and \$5 billion annually in lower rail rates.³⁴

Price Structure

During the 1980s, some "captive shippers" -- mainly coal companies and electric utilities -- complained that remaining ICC

³¹Standard & Poor's, "Railroads and Trucking -- Basic Analysis" (Sept. 22, 1988), at 15.

³²Interstate Commerce Commission, Office of Transportation Analysis, "Rail Rates Experience Multi-Year Decline" (April 1989), at 1.

³³Office of Economics, Interstate Commerce Commission, The U.S. Motor Carrier industry Long After Deregulation (March 1992) at 11.

³⁴Christopher C. Barnekov and Andrew N. Kleit, "The Costs of Railroad Regulation: A Further Analysis," Federal Trade Commission Working Paper No. 164 (May 1988) at 15.

regulation did not adequately protect them from railroad monopolies. In reality, railroads' coal rates generally fell after deregulation. Inflation-adjusted coal rates did rise by 4 percent in 1982, but then fell by 13 percent between 1982 and 1988. During the 1980s, numerous electric utilities reduced electricity prices because of falling rail rates for coal.³⁵

Deregulation lowered rail rates on virtually all products. An ICC study revealed that between 1980 and 1987, railroads' inflation-adjusted revenue per ton fell by 12 percent for coal and more than 20 percent for farm products, food, pulp, paper, chemicals, intermodal, and many other types of freight. Only lumber and transportation equipment experienced increases -- in both cases less than 5 percent for the 7-year period.³⁶ Some shippers have reaped more benefits than others from deregulation, but nearly all have profited to some extent -- including the "captives."

As with telecommunications, the railroad discussion reveals the danger of relying on narrow definitions of the consumer interest. During the 1980s, some public interest organizations argued that the railroads should be forced to lower coal rates so that consumers could enjoy lower electricity rates. But

³⁵Michael Becker, Jerome Ellig, and Nancy Oliver, "Railroad Regulation and Consumer Interests," CSE Foundation Economic Perspective No. 28 (May 17, 1990) at 7.

³⁶Interstate Commerce Commission, "Rail Rates Experience Multi-Year Decline" (April 1989).

electricity accounts for only 2 percent of consumers' annual expenditures.³⁷ Lower coal rates would prompt railroads to raise rates on other types of shipments, such as food, clothing, building materials, automobiles, and furnishings. To focus only on 2 percent of consumer expenditures distorts any concept of the consumer interest beyond reason.

Regulators should keep this in mind as it considers the effects of electricity deregulation on consumers. Consumers do not just buy electricity directly from utilities; they also pay for electricity indirectly when they buy other goods and services. When utility or public interest groups argue that competition for large customers would force utilities to raise rates for "captive" customers, they ignore the fact that consumers ultimately pay corporate electric bills too. The Commission can best promote the consumer interest by pursuing policies that ensure that consumers can buy all goods and services -- not just electricity -- at the lowest prices possible.

Quantity

Pricing flexibility allowed railroads to stem their steady loss of market share to the trucking industry. Between 1920 and 1980, rail's market share of intercity ton-miles fell from 75 percent to about 36 percent. Deregulation helped stabilize

³⁷U.S. Dept. of Commerce, Statistical Abstract of the United States (1988) at 412.

rail's market share, ending a decades-long decline.³⁸ By 1989, railroads moved 11.4 percent more traffic (measured in revenue ton-miles) using 40 percent fewer employees and 27,000 fewer miles of track.³⁹

Quality

Prior to deregulation, many shippers considered the term "rail service" an oxymoron. The main reason was that regulation rendered railroads so unprofitable that they failed to invest in maintenance and improvement. In 1976, inadequate maintenance forced trains to operate at reduced speeds on one out of every seven miles of railroad track in the nation. Some track was so poorly maintained that parked railroad cars would actually fall off the track, leading the industry to coin a new term -- "standing derailment."⁴⁰

Deregulation encouraged railroads to improve reliability by spending more than \$115 billion on capital improvements.⁴¹ The Federal Trade Commission estimated that shippers save between \$5 billion and \$10 billion annually due to the timelier and more

³⁸Matthew B. Kibbe, Putting Consumers on the Fast Track: A Transportation Primer (1989) at 15.

³⁹President's Council on Competitiveness, The Legacy of Regulatory Reform: Restoring America's Competitiveness (Sept. 1992) at 11.

⁴⁰U.S. Dept. of Transportation, A Prospectus for Change in the Freight Railroad Industry (Oct. 1978) at 27.

⁴¹President's Council on Competitiveness, The Legacy of Regulatory Reform (Sept. 1992) at 12.

reliable service that these improvements made possible.⁴² A nationwide survey in 1987 revealed that 72 percent of shippers believed service quality and reliability had improved since deregulation. Loss and damage claims declined by more than 50 percent.⁴³ Railroads are much safer as well; the number of accidents fell by 62 percent between 1980 and 1988.⁴⁴

Open Access

In certain cases, the ICC can require one railroad to permit a competitor to use its track and facilities. Technologically, this is easy; for purposes of traffic control, the "foreign line's" trains are treated just like any other trains on the host line. Indeed, some railroads even voluntarily permit others to run trains over their tracks. If one railroad can operate a train less expensively than the one that owns the track, both railroads have a profit incentive to negotiate open access. The traffic gets moved at a lower total cost, and the two railroads can split the cost savings. In general, however, most of the policy discussion since deregulation has focused on price regulation, rather than open access.

⁴²Barnekov and Kleit, "The Costs of Railroad Regulation" at 15.

⁴³Jerome Ellig and Dan Witt, Myths About Transportation Deregulation (1988) at 23.

⁴⁴Becker, Ellig, and Oliver, "Railroad Regulation" at 12.

TRUCKING

Trucking companies are similar to independent power producers, in that they do not own the highways that they must use to serve their customers. Like airlines, trucking companies use a government-owned right-of-way that is open to all users -- unless it is congested.

On the federal level, trucking deregulation occurred with the Motor Carrier Act of 1980. Prior to this legislation, the Interstate Commerce Commission rigidly controlled entry into the trucking industry, and truckers had to obtain permission from the ICC -- and their competitors -- before cutting rates. Many large firms found it profitable to bypass the regulated common carriers by acquiring their own trucking fleets. Since these fleets could not carry others' goods for hire, they often cruised empty on the return trip, wasting fuel, time, and money. The Motor Carrier Act changed this situation by expediting entry and permitting truckers to cut rates on their own initiative. Today, most shippers and truckers (except for a limited class of common carriers) negotiate bilateral contracts.

Price Level

Deregulation reduced trucking rates significantly. One early study concluded that deregulation reduced truckload rates by 25 percent and less-than-truckload rates by 11 percent.⁴⁵ A

⁴⁵Study by Hoover Institution economist Thomas Gail Moore cited in President's Council on Competitiveness, The Legacy of Regulatory Reform (Sept. 1992) at 19.

U.S. Department of Transportation study found that the Motor Carrier Act saves shippers approximately \$10 billion annually.⁴⁶ A Cato Institute study put the savings higher, at \$30 billion annually.⁴⁷

Price Structure

Many critics feared that trucking deregulation would benefit only large shippers in large cities, leaving rural areas without affordable service. In reality, a 1988 Interstate Commerce Commission study concluded that deregulation lowered prices and improved the quality of service for shippers in small communities as well as large ones.⁴⁸

Quantity

Trucking volumes wax and wane with the business cycle, and deregulation seems to have had little effect on that trend. As the accompanying table shows, the volume of freight shipped by truck dropped during the recession of the early 1980s, then recovered by the end of the decade.

⁴⁶Cited in Bureau of Economics, Interstate Commerce Commission, *The U.S. Motor Carrier Industry Long After Deregulation* (March 1992) at 6.

⁴⁷Robert V. Delaney, *The Disunited States: A Country in Search of a Transportation Policy* (March 10, 1987).

⁴⁸Matthew B. Kibbe, *Putting Consumers on the Fast Track: A Transportation Primer* at 11-12.

AMERICAN TRUCKING ASSN. VOLUME INDEX⁴⁹

| | | | |
|------|-----|------|-----|
| 1972 | 128 | 1981 | 147 |
| 1973 | 142 | 1982 | 129 |
| 1974 | 135 | 1983 | 136 |
| 1975 | 121 | 1984 | 144 |
| 1976 | 137 | 1985 | 137 |
| 1977 | 148 | 1986 | 148 |
| 1978 | 157 | 1987 | 164 |
| 1979 | 157 | 1988 | 177 |
| 1980 | 148 | 1989 | 168 |

Quality

Deregulation freed truckers to tailor services to meet the diverse needs of specific shippers. Stiff competition also prompted many carriers to offer guaranteed delivery dates in order to attract or retain customers. Guaranteed delivery dates enabled many manufacturers to adopt "just-in-time" inventory management; the smaller inventories are now carried "on wheels" instead of in warehouses. A 1987 Cato Institute study found that the improvement in reliable, on-time delivery saved Americans \$30 billion in inventory costs in 1985 alone.⁵⁰ Surveys of shippers, meanwhile, consistently show that deregulation improved the overall quality of service.⁵¹

Safety has also improved under deregulation. The number of fatal accidents involving truckers has trended downward, falling

⁴⁹U.S. Dept. of Commerce, Survey of Current Business, various issues.

⁵⁰This is in addition to the \$30 billion savings in trucking rates. See Robert V. Delaney, *The Disunited States: A Country in Search of an Efficient Transportation Policy* (March 10, 1987).

⁵¹President's Council on Competitiveness, *The Legacy of Regulatory Reform* (Sept. 1992) at 19.

from 2,998 in 1978 to 2,609 in 1986. The total number of trucking accidents fell from 33,998 in 1978 to 26,176 in 1986. These figures are all the more impressive when one remembers that the total number of miles traveled by trucks annually has steadily increased.⁵²

Open Access

The highways used by truckers are analogous to the transmission and distribution lines owned by electric utilities. As with airlines, poor pricing policies have generated tremendous inefficiencies. In some cases, the inefficiency takes the form of congestion. In many more cases, the inefficiency takes the form of excessive bills for highway repairs, because the taxes truckers pay do not accurately reflect the costs that their vehicles impose on the highway system. In general, trucks with heavy weights per axle pay much less than the costs they impose, while trucks with low weights per axle pay more. An urban 2-axle vehicle weighing 33,000 pounds, for example, generates (marginal) road costs of 23.77 cents per mile, but only pays about 3 cents per mile in taxes. An urban tractor trailer with many axles, on the other hand, generates (marginal) road costs of 1.2 cents per mile, but pays about 4 cents per mile in taxes. Clearly, truckers have strong incentives to use heavy vehicles with fewer axles, which impose the heaviest wear and tear on the roads. A

⁵²Matthew B. Kibbe, Putting Consumers on the Fast Track: A Transportation Primer at 10.

Brookings Institution study estimates that marginal cost pricing for road use -- such as a fee based on weight per axle -- would reduce road maintenance costs by \$6.44 billion annually.⁵³

The lesson for electricity here is analogous to the one drawn for airlines: pricing for transmission and distribution facilities should reflect marginal costs. The prices need not be "optimal" in an economist's sense; optimal pricing in the real world is probably beyond the capabilities of any mortals. But regulators should strive to be approximately right by incorporating marginal principles.

SUMMARY

Across diverse industries, deregulation and competition have generated some common results: lower price levels, price reductions for most customer groups, expanded sales, and improved or unchanged quality of service. Some form of open access occurs in all of these industries, although poorly-designed pricing policies can lead to major inefficiencies. In each case, critics argued that deregulation would not work because of special industry characteristics. Thus far, we have yet to find the special industry in which deregulation promotes higher prices or poor service. For these reasons, regulators should discount predictions that electricity deregulation will lead to disaster.

⁵³Kenneth A. Small, Clifford Winston, and Carol A. Evans, Road Work (1989) at 79.