NRRI 00-07

THE STATE OF REGULATION: NRRI'S ANNUAL EXAMINATION OF THE FOUR UTILITY SECTORS AND A LOOK FORWARD

David W. Wirick
Associate Director

Kenneth Costello
Senior Institute Economist

Vivian Witkind Davis
Associate Director

Kenneth Rose
Senior Institute Economist

John Wilhelm
Research Associate

THE NATIONAL REGULATORY RESEARCH INSTITUTE
THE OHIO STATE UNIVERSITY
1080 Carmack Road
Columbus, Ohio 43210-1002
Phone: 614/292-9404
Fax: 614/292-7196
Website: www.nrri.ohio-state.edu

March 2000

Foreword

In this era of rapid technological innovation, vast changes in the speed and volume of information transmission, changing consumer expectations, and a global groundswell toward less government and liberalization of markets, nearly every segment of the world economy can claim unprecedented levels of upheaval. That is certainly the case with the U.S. utility industry, which is rapidly becoming more competitive, more diverse, and more dynamic.

This document lays out some of the insights of the staff of the National Regulatory Research Institute (NRRI) with regard to the evolution of the utility industry and its regulation. It provides some historical overview, analyzes changes that have affected the utility sectors, and makes forecasts of future developments. It also addresses the challenges to be faced by public utility regulators and policymakers in these dramatically changing circumstances. A chapter is devoted to each utility sector: electricity, natural gas, telecommunications, and water. A chapter also separately addresses public utility regulation in general. This document is intended to be the first of an annual series of NRRI reviews of the utility industry and its regulation.

These are exciting and challenging times for those with a stake in utility service delivery, a group which includes nearly every citizen of the United States. Those with responsibility for service delivery, the utilities and their regulators, will be taxed to create innovative strategies for ensuring that the dream of inexpensive, universally available, safe, and reliable service is realized in an environment that borders on chaos. Despite these challenges, we find reason for optimism.

The material herein reflects the opinions and views of the authors only, and does not necessarily reflect the views and opinions of the National Regulatory Research Institute (NRRI), the National Association of Regulatory Utility Commissioners (NARUC), or any NARUC-member commission.

TABLE OF CONTENTS

Four Evolving Issues for Policymakers in an Era of Continual Change in the Electric Industry

- ***KENNETH ROSE*** *is a Senior Institute Economist and has been working on energy and regulatory issues for more than fifteen years.*

He has testified or presented at many state legislative and public utility commission hearings, proceedings, conferences, and workshops on electric industry restructuring. He has also testified before several committees of the U.S. House of Representatives on regulatory matters.

Since joining the Institute in 1989, he has worked primarily on studies concerning the electric industry and has directed or contributed to many reports, papers, articles, and books.

Introduction: An era of rapid changes for the electric supply industry

Anyone with even a casual familiarity of what has been occurring in the electric industry is likely to be impressed with the speed and extent of the changes over the last few years. An industry, once known for its stodginess and resistence to change, has been undergoing its most substantial transformation in over six decades. There have been other times in the industry's history that change of this magnitude has occurred. The beginning of the industry in the eighteen-eighties through the end of the 19th century was a period of rapid growth from small scale lighting and industrial use to more widespread availability. In these early days, some cities had many electric entrepreneurs vying for customers within the city's limits. In the early twentieth century, another tumultuous period ensued where the industry consolidated and became regulated by states (beginning in 1907). This period came to a sudden

halt with the Great Depression, the collapse of some large holding companies, and the passage of the Public Utility Holding Companies Act (PUHCA) in 1935. In the aftermath of PUHCA, the number of investor-owned utilities expanded and the industry entered a period of relative calm. The 1970s brought new challenges from higher fuel prices and reduced demand growth. This period ushered in a new era that we are still living in today that coincided with a more general trend toward deregulation of many other industries.

In many respects, the pace of change in the electric industry has been faster than in other extensively regulated utilities. Table 1 is a time line of major events that have taken place in the past twenty-two years for three utility industries that have been undergoing considerable changes in recent years—telecommunications, natural gas, and electric. Long-distance telephone deregulation dates back the farthest, to at least 1980, with local telephone competition beginning more recently. The Natural Gas Policy Act was passed in 1978 and began natural gas industry deregulation with wellhead price deregulation. The main purpose of the Public Utility Regulatory Policies Act (PURPA), also passed in 1978, was not to introduce competition into the electric industry. Rather, the main intention was energy conservation by encouraging or removing obstacles to cogeneration and renewable energy production. PURPA did, however, pave the way for independent power by demonstrating that alternatives to central station power generation were feasible. The movement toward wholesale competition did not begin until 1988 when the Federal Energy Regulatory Commission (FERC) began requiring open access as a condition for approval of mergers. Mandatory open access did not begin until the Energy Policy Act of 1992 (EPAct) and FERC's implementation of the EPAct with Order 888 in 1996. The first states to pass restructuring legislation also did so in 1996. Table 2 at the end of this review is a state-by-state listing of when restructuring laws were passed and when retail competition began or is set to begin.

In many respects, the pace of change in the electric industry has been faster than in other extensively regulated utilities.

This relatively rapid movement toward competition in electric has left many who closely follow the industry huffing and puffing. It is possible, however, to get a little advanced warning by looking ahead at this point to see what will remain important topics and what will come to the fore in the next few years. Below are four major issues that are or will likely need to be addressed by policymakers in the coming years. Transition issues that arise as a result of

Table 1. Time line of major events in telecommunications, natural gas, and electric competition and retail choice.

Year	1978	1979	1980	1981	1982	1983	1984	1985
Telecom			Computer II FCC decision deregulates Customer Premises Equipment	Competitive Common Carrier decision authorizes competitive long distance services	Judge Green's consent decree to break up AT&T		Breakup of AT&T	
Nat. Gas	Natural Gas Policy Act partially deregulates wellhead prices						FERC Order 380 eliminates penalties for gas utilities to shop for gas	FERC Order 436 provides for open access by pipelines
Electric	Public Utilities Regulatory Policies Act (PURPA)							

Year	1986	1987	1988	1989	1990	1991	1992	1993
Telecom	Computer III decision lowered separation requirements							
Nat. Gas				Natural Gas Wellhead Decontrol Act eliminates all price controls			FERC Order 636 prohibits pipelines from offering bundled sales service	
Electric			FERC requires open transmission access as condition of merger				Energy Policy Act mandates open transmission access	

Year	1994	1995	1996	1997	1998	1999
Telecom			Telecom-munications Act opens local markets			Iowa Utility Board Supreme Court decision, Bell Atlantic/NY 271 decision
Nat. Gas		Beginning of state customer choice programs				
Electric	California report proposes retail access	California orders retail access	FERC Order 888 and first state restructuring laws passed	retail choice phase-in begins in Rhode Island	Retail access begins in California and Massachusetts	FERC Order 2000, voluntary RTO formation, states with restructuring legislation reaches 23 and the District of Columbia

restructuring legislation, including rate unbundling, uneconomic or “stranded” costs, and transmission and distribution rate setting, are slowly being addressed and beginning to fade in importance.[1] The issues below are ones that will begin to or will continue to be the most prominent in the near future. This review is intended as a look ahead at what we are likely to be dealing with in the coming years. Two of these issues are not new; in fact, a few are decades old. What these issues have in common besides the electric industry is that the solutions to these issues will not be easy ones for policymakers. Definitive solutions to these issues are not provided here, only explanations as to why they will be important in the next few years.

- **Market power will continue to be a major issue for states and FERC as generation becomes increasingly competitive**

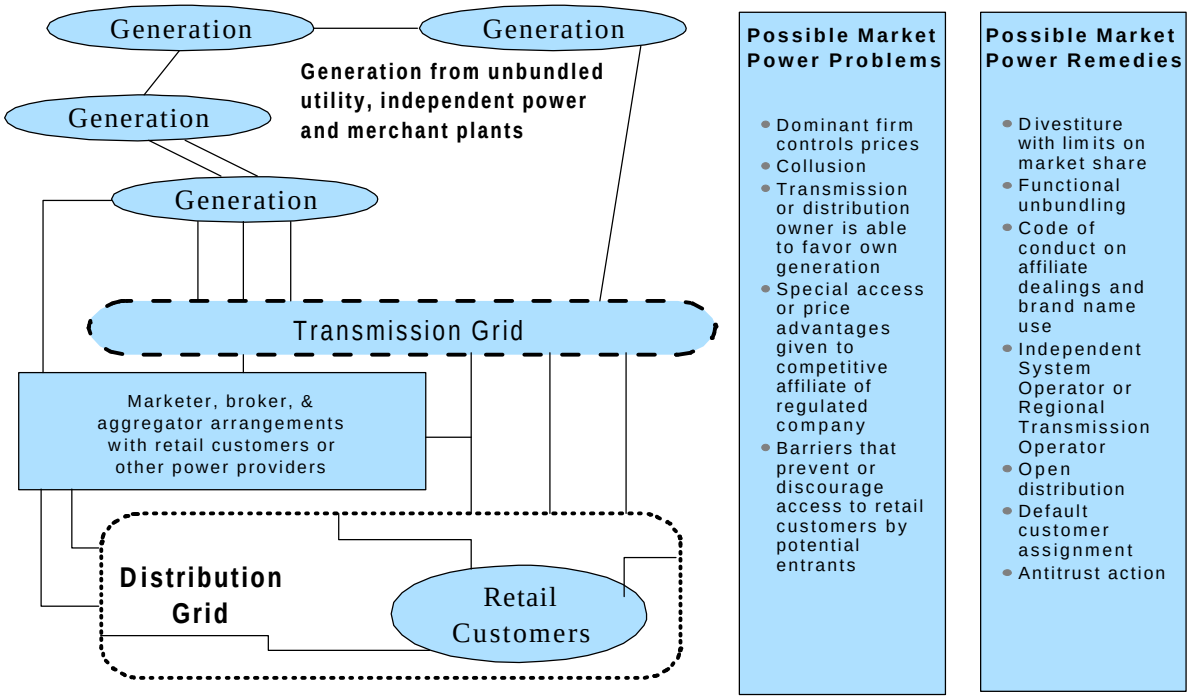
Market power is a topic that will likely be with us for many years to come. As long as there is a network of monopoly-owned transmission and distribution lines delivering power to retail and wholesale customers, there will be discussions of whether generators have market power and how it can be deterred if they do. Market power is much more complicated than simply trying to identify when a supplier has market power and then deciding to do something about it. Detecting horizontal market power in generation markets will require detailed analysis of power markets that will often prove inconclusive. For the electric industry, even just defining the market area in question and defining the products will be formidable tasks. The reason for this is the regional nature of power market areas with inexact and shifting borders and the multiplicity of products that include firm, nonfirm, wholesale, retail, peak, off-peak, and ancillary power. After that is determined, the issue turns to choosing appropriate measures of market power from a wide variety of methods.

The basic definition of market power is deceptively simple—it is the ability of a firm to raise and maintain its price significantly above what would occur if the market were competitive. In the electric supply industry it is the ability of a supplier or group of suppliers to raise and maintain a price that is significantly above a competitive level. This allows the supplier or suppliers to earn economic profits in the long run that are socially inefficient. In order to obtain this market power and earn economic profits, the supplier or suppliers would have to prevent or discourage entry by other firms into the market. An effective barrier to entry prevents other suppliers from challenging the higher price of the firm with market power. If there is relatively easy entry by other firms, then it is less likely that the firm will be able to maintain its market power.

The basic definition of market power is deceptively simple—it is the ability of a firm to raise and maintain its price significantly above what would occur if the market were competitive.

Because of this necessity of raising an effective barrier to market entry against potential entrants, market power is, at its core, a market structure issue. On the left side of Figure 1 is a diagram of the current market structure of the electric supply industry. On the right side is a summary list of potential market power problems that could arise and possible remedies

Figure 1. Evolving market structure and corresponding market power issues of the electric supply industry.



that are available; many of which are already being adopted by states and FERC.[2] It is a basic supposition of economics that no single firm or group of firms is able to unilaterally affect the market price if the market is competitive. If, however, they are able to use some means to control or influence prices, then they have some degree of market power. If the market power is relatively modest, for example, a supplier is able to raise prices less than 5 percent at only peak times, then it may be decided that taking direct action against the supplier is not necessary. Rather, general structural changes may be deemed more appropriate, to an Independent System Operator (ISO) for transmission. If the market power is more serious, for example, affecting price more than 20 percent at several times during the day by one or more suppliers, then more direct action may be called for. This may include

structural changes plus additional requirements placed on the supplier or suppliers such as stricter codes of conduct or asset divestiture. There are two primary types of market power in the electric supply industry, vertical and horizontal market power. Vertical market power exists when a transmission or distribution owning company can favor itself or its own affiliate in the provision of a competitive service—this is the bottom half of the diagram in Figure 1. This is a barrier to entry that prevents other suppliers from having fair access to wholesale or retail customers. These barriers may be price, such as from excessively high transmission or distribution fees, or nonprice, such as from burdensome and excessive conditions and qualifications to use the transmission network. This vertical market power allows a single supplier or group of suppliers a significant strategic advantage in terms of access to customers that other suppliers simply will not be able to obtain. RTOs and ISOs are designed to prevent vertical control by a firm or group of firms to favor their own generation. Divestiture of generation completely removes this possibility since the generation owners and transmission and distribution owners are separated.

A problem faced in electric restructuring is that, absent divestiture with market share limits, incumbent firms will usually start with considerable market share.

The second primary type of market power occurs within the same competitive service, such as, generation service, and is referred to as horizontal market power. This can occur when a supplier or group of suppliers is able to influence the price of the competitive product. The most commonly cited example of this is when a firm has a large share of the market or is “dominant” and faces competition from several much smaller or “fringe” firms. The firm’s size or its market share alone, however, is not an indicator of market power. A firm with a large share in a market that new entrants are able to enter and exit from with relative ease (that is, low or no sunk costs), will unlikely be able to maintain market power. It is possible that a generation supplier could have considerable market share but little or no market power.[3] Divestiture with initial limits on market share is a way to prevent one firm from acquiring a “dominant” market position.

A problem faced in electric restructuring is that, absent divestiture with market share limits, incumbent firms will usually start with considerable market share. As has been seen with long-distance telephone service, the market share of the incumbent may take many years to erode. Again, having a large market share does not necessarily mean the incumbent has market power. However, it is clear that incumbent firms will begin with considerable market advantages, including name recognition, proximity to

generation (if still owned by the distribution firm), and usually, for at least the period of the transition from regulation to competition, financial assistance for potential market losses due to competition (that is, “stranded” cost assistance). These advantages combined with an observed reluctance of customers to switch to alternative service providers will impede robust competition for at least several years. The effect of this, of course, is to delay the benefits of competition to customers for years, perhaps even many years. Policy mechanisms to speed up this process are usually met with fierce opposition from the incumbent firms themselves.

If the present trend continues, it will substantially alter the current industry structure that existed for the last three quarters of a century.

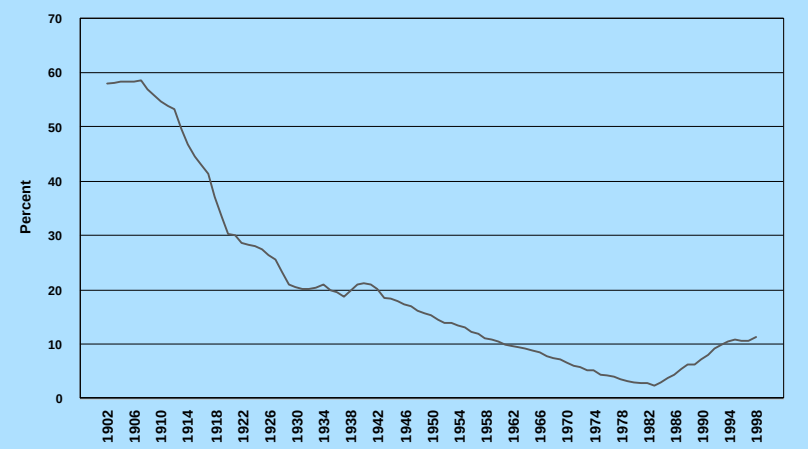
Defining market power, even pinpointing where it is likely or where it can occur, is relatively straightforward. Detecting when market power actually occurs, the magnitude when it is exercised, and what steps should be taken to correct the problem once it is found are where the disputes will arise. This intractability and inexactness of the problem is, simply put, the reason why market power will remain a topic of discussion for years to come.

- **Nonutility generation continues to increase its share of U.S. total electric production**

The electric industry is in the midst of a significant shift from utility-owned generation toward increasing proportions of nonutility generation. If the present trend continues, it will substantially alter the current industry structure that existed for the last three-quarters of a century. Nonutility generation is not a new phenomena. As Figure 2 shows, nonutility generation dates back to the earliest days of the industry when most power was generated by industrial firms for their own use. Nearly 60 percent of total electric production was from nonutility generators, mostly industrial production, in 1902. It quickly declined from that point, dropping below 50 percent in 1913, below 25 percent in 1928, and below 10 percent in 1961. It hit a low of 2.4 percent in 1983, but has since seen a gradual rise in all but two years since. For the ten year period of 1989 through 1998,[4] nonutility generation as a percent of total industry production has nearly doubled and has increased by more than fourfold since the low reached in 1983.

Why did the amount of nonutility generation turn the corner and begin to rise in 1984, after nearly a steady drop for almost eighty years? Clearly, the effect of PURPA on nonutility generation is evident. PURPA was passed in 1978 and implemented by FERC and the states

Figure 2. Nonutility generation as a percent of total electric production (1902 through 1998).



in the early eighties. PURPA and FERC and state rules required utilities to interconnect with "qualifying facilities," not discriminate against them when selling backup, maintenance, and other power requirements, and to pay an "avoided cost" price for power sold back to the utility. Generators that qualified were usually industrial cogenerators and "small power producers" that used renewable resources that meet criteria set by FERC and the states.

However, there are at least two other important factors that are currently at work besides PURPA. First, most of the new capacity in the industry has been nonutility. Nonutility companies added 3,002 MW of new requirements in 1998 while electric utilities added 458 MW and *retired* 2,867 MW in the same year (this included 2,721 MW from three nuclear units).[5] For the ten-year period of 1989 through 1998, generation (kilowatthours) from electric utilities increased by 15.4 percent while generation from nonutility sources increased by 121.5 percent.[6] Nonutility generation was given a regulatory boost when the Energy Policy Act in 1992 and subsequent FERC rules created "exempt wholesale generators" that relieves certain wholesale generators from PUHCA requirements.

The second factor, and more significant recently, is that plants that were once classified as an electric utility have been sold and reclassified as a nonutility. In 1998, 23,397 MW were sold and reclassified as a nonutility.[7] A large part of this is a consequence of industry restructuring, since the 1998 number includes plants sold in California and Massachusetts, which accounted for 19,103 MW, or almost 82 percent of the total 1998 reclassifications. Both these states, as part of their restructuring efforts, required at least partial sale of utility generation assets. However, while

reclassification from the sale of assets may be required or encouraged voluntarily because of state restructuring, sale of assets and reclassification does not require restructuring. Of the 1998 total reclassifications, 2,493 MW or 10.7 percent were in states that have not passed a restructuring law.

There is a technology shift that undergirds this trend that developed along with the regulatory changes that removed the impediments to or encouraged nonutility generation. This shift is a reversal of a trend that began early in the last century when, as noted, over half the generation was nonutility. At that time, utilities grew in size by expanding capacity and combining with other utilities. Output rose from individual utilities as they became more concentrated and they were able to take advantage of scale economies. As a result, costs of generation fell as output increased. Prices also fell throughout this period which increased the quantity demanded from all customer classes and persuaded industrial customers that it made more sense to purchase power from a utility than generate it themselves. Also, general demand for electricity increased as more electric applications were introduced and from economic growth.

This trend appears to be moving toward an even smaller scale. . . mak[ing] inroads for industrial and commercial applications and residential use perhaps on the horizon.

This general trend of rising output and falling costs and prices continued until the early 1970s. Since that time, new generation technologies have been introduced that enabled smaller generation units to be comparable in costs to much larger plants. These units are also more modular allowing incremental expansion with less risk to the owner. Of the thirty units electric utilities added in 1998, most were less than 10 MW petroleum units and only three units were 100 MW or larger (the two largest being 113 MW and 114 MW natural gas units).[8]

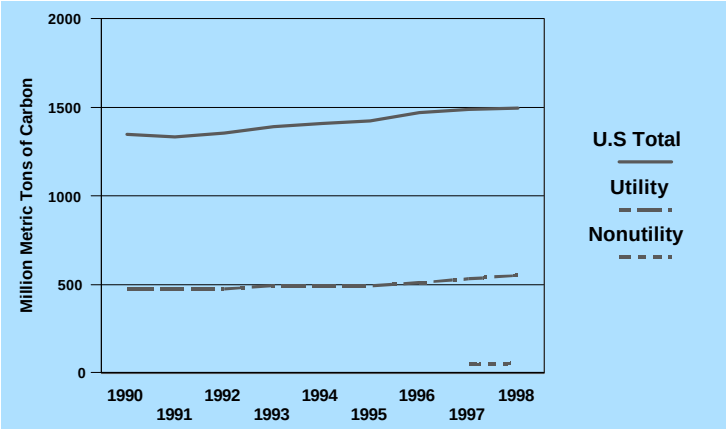
This trend appears to be moving toward an even smaller scale with “micro-turbines” and fuel cells beginning to make inroads for industrial and commercial applications and residential use perhaps on the horizon. While it will take years for these newer technologies to begin to have an impact on total production amounts, the general trend of smaller-scale technologies combined with the effects of restructuring described above may signal the beginning of a major shift, conceivably even accelerated recently, back toward proportionately more nonutility generation over the next ten years. If so, then sometime early in this new century the industry may begin to look more like it did early in the last.

• Environmental impact of electric production returns to the forefront

While it is well beyond the scope of this review to settle the global warming debate here, it is not premature to consider industry trends in terms of carbon dioxide emissions and what possible impact a freeze or reduction in emissions would have. From the 1990 level to 1998, total U.S. emissions increased by just over 11 percent, while utility emissions grew by 15.3 percent. As a result, the proportion of utility emissions grew from 35.4 percent of total emissions to the 1998 level of almost 37 percent. Overall, electricity production accounted for just over 40 percent of the 1998 emission of carbon dioxide in the U.S.[9] Of this total percentage, 36.8 percent was from electric utilities and 3.7 percent was from nonutility sources. Not surprisingly, given the trend discussed above, nonutility emissions grew at a faster rate than utility emissions from 1997 to 1998, when utility emissions increased by 3.2 percent, and nonutility emissions increased by about 9 percent. It is reasonable to expect that the proportion of carbon dioxide emissions from nonutility sources will continue to increase over time. Figure 3 graphs total U.S., utility, and nonutility carbon dioxide emissions from 1990 through 1998.

Past and present environmental controls and limits on power generation are complex and have had a considerable impact on the

Figure 3. U.S. total, utility, and nonutility carbon dioxide emissions (1990 through 1998).



industry's fuel use and generation costs over the years. The industry has been subject to federal environmental regulation for over thirty years and in some instances from additional state laws as well. This took the form of increasingly more stringent controls on air and water emissions and on technologies to reduce emissions.

Because of the trend toward more nonutility generation, any emission freeze or reduction of carbon dioxide will have to be much broader than in the past. Any freeze or reduction of carbon dioxide will have to recognize the shift away from utility-based emissions since the industry is simply not the monolith it once was when previous environmental laws were passed.

It is too early to tell if there will be any limits on carbon dioxide emissions and, if so, what form they will take. But with electric power generation accounting for over 40 percent of the

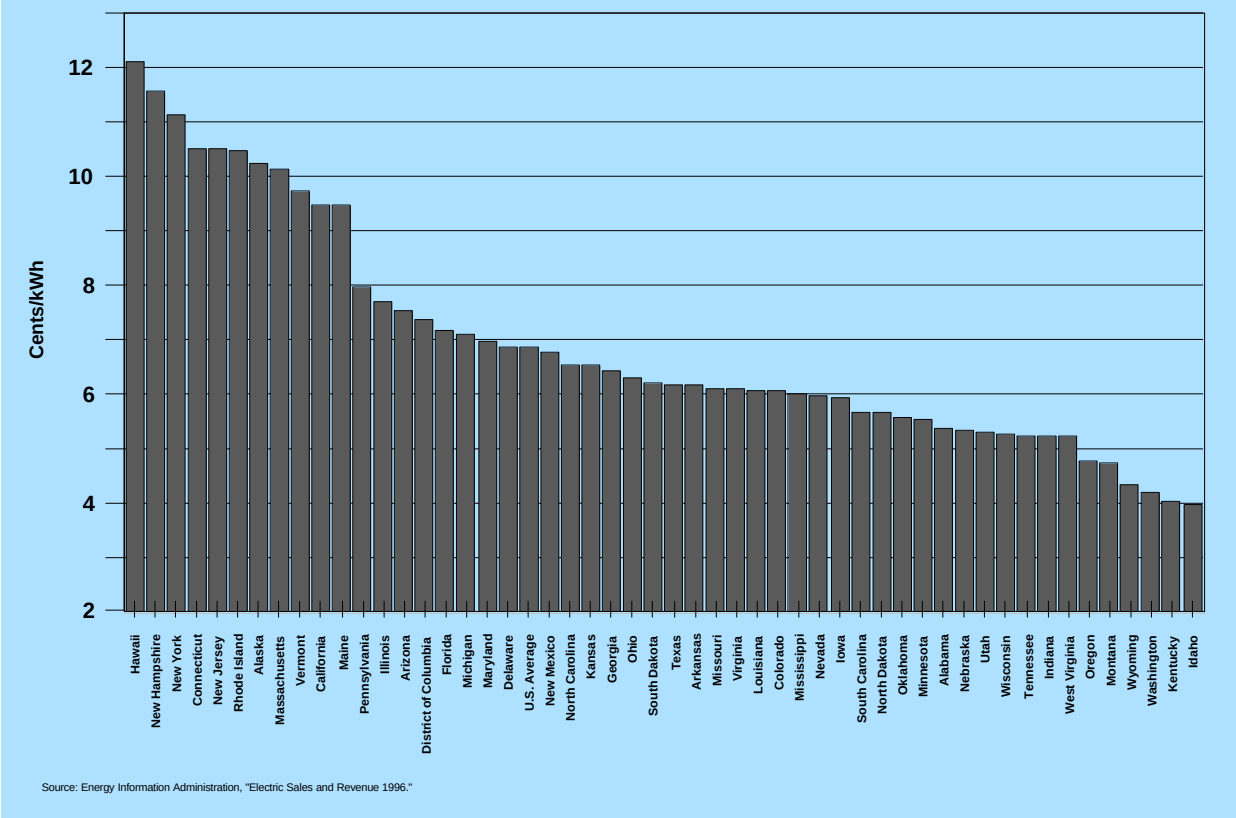
U.S.'s total carbon dioxide emissions, and considering that the regulated utility sector has already been subject to significant environmental regulations over the years, the sector is unlikely to be overlooked should any legislative or regulatory initiatives to limit or reduce carbon dioxide emissions be seriously considered.

- **What should low-rate states do, if anything, on restructuring?**

As Table 1 (at the beginning of this review) and Table 2 (at the end of this review) demonstrate, state restructuring of the industry has moved quickly in a relatively short amount of time. At this time, states are currently nearly bifurcated; twenty-three states and the District of Columbia have either adopted legislation or the commissions have taken some action to restructure and allow at least some retail access. The remaining twenty-seven states are either working on restructuring or taking very little action at this time. States that have taken some restructuring action range from those that currently allow retail choice with fully implemented plans to states that passed legislation or a commission order recently with considerable implementation work remaining. Table 2 is a summary of when major restructuring actions occurred and when retail access began or is expected to begin. Figure 4 graphs the 1996 average revenue (or average rates) from all sectors for each state in descending order. 1996 was chosen since it was the last year when the country as a whole was mostly regulated at the retail level with no significant retail access. As can be seen from the graph, the states that have taken action so far are concentrated among those with the highest average revenue. Fifteen out of the nineteen states, or 79 percent, with average revenues above the U.S. average have taken some action. However, nine of the thirty-two states, or 28 percent, with average revenues below the U.S. average have also taken some action.

The issues faced by the states that have not acted are, for the most part, different than those faced by the states that have already acted. The first question is, of course, whether any action should be taken at all. States with the lowest average revenue in the country may consider the more modest benefits at best from restructuring simply not worth the considerable effort needed to implement retail access. Indeed, there is even some risk that restructuring may lead to higher prices if the state joins other high cost states in a regional system. Whether this would happen or not requires a case-by-case analysis, but clearly the perception and concern is an issue. Despite this concern, however, two states among the lowest 20 percent of average revenues in the country have taken restructuring action (Montana and Oregon).

Figure 4. Average revenue by state for all sectors (1996).



Another important distinction is that, for many of these states, rather than their utilities having potential uneconomic costs (or "stranded" costs), they have potential benefits or competitive gains. For the higher average revenue states this was one of the more contentious issues to deal with. It might be expected, therefore, that for states with no uneconomic costs but competitive gains instead, that restructuring should be easier. This has simply not been the case. The issue of potential gains raises more issues, not fewer, on the question of equity between shareholder gains and modest or possibly worse off retail customers under competition. It is reasonable to expect that, if a state chooses to go ahead with restructuring, more consumer protections would be put in place in the form of longer-term price ceilings, larger discounts, or having customer choice phased-in more slowly than some higher average revenue states have done.

Several of the states that have not taken any action on restructuring to date, are currently working toward that goal and may be completed within the next year.

Conclusion

There is no doubt that the electric industry is in the midst of historic changes. There is also no doubt that the decisions being made now by policymakers will have a profound impact on future development of the industry. The four evolving issues examined here were not selected to be prognostications of the future. Rather, they are quickly unfolding right now.

These are by no means the only significant issues that policymakers will be faced with in the next few years. But it is a fair bet that these, or issues related to these, will occupy a considerable amount of their time as the turbulence in the industry continues. Stay tuned.

The decisions being made now by policymakers will have a profound impact on future development of the industry.

Table 2. When restructuring legislation became law and timing of retail choice.

State	Bill Passed or Signed	Choice Begins
Arizona	Law signed 5-29-98 ACC orders 12-10-98, 1-5-99, and 9-29-99	Law required 20% by 12-31-98 and for all cust. by 12-31-2000. '98 order set 1-1-99 as the beginning and fully open by 1-1-2001. The first '99 order temporarily stayed the previous order. Second '99 order reestablished 1-1-2001 as when all cust. will have competitive access. Settlements established phase-in schedule.
Arkansas	Signed 4-15-99	By 1-1-2002 No later than 6-30-2003
California	Passed Sept. 1996	Original date was 1-1-98, but delayed until 3-31-98
Connecticut	Signed 4-29-98	1-1-2000 phase-in begins
Delaware	Signed 3-31-99	For Delmarva Power & Light, large cust. begin 10-1-99. All cust. by 10-1-2000
District of Columbia	DCPSC approved Potomac Electric Power's restructuring plan 12-30-99	January 2001 commercial and government customers and begin residential pilots
Illinois	Signed Dec. 1997 Amended law signed 6-30-99	Begins 10-1-99 for large customers. All cust. by 5-1-2002
Maine	Signed 5-29-97	3-1-2000
Maryland	Signed 4-8-99, first PSC Order issued 12-3-97	Set to begin 7-1-2000 with all IOU cust. by 7-1-2002
Massachusetts	Law signed 11-25-97 DPU Order 12-30-96	3-1-98
Michigan	Six PSC orders issued between 6-5-97 and 8-17-99, no legislation passed.	12 ½% of load before 2002, all cust. in 2002 (original phase-in was to begin March of '98, but was delayed by legal challenge).
Montana	Signed April 1997	Pacificorp pilot begins July 1998, residential Jan. 1999 Montana Power pilot begins July 1999
Nevada	Signed July 1997	Originally scheduled for 12-31-1999, delay expected
New Hampshire	Signed 5-21-96, NHPUC final plan issued 2-28-97, lawsuit filed by Public Service New Hampshire March 1997, settlement process is currently ongoing	Originally scheduled for 1-1-98, court issued stay on restructuring plan in PSNH's lawsuit. Retail access pilot program continued until lawsuit is settled. Settlement with Granite State Electric Company allows customer choice by 7-1-98
New Jersey	Signed 2-9-99	November 1999

Table 2 – *continued*

State	Bill Passed or Signed	Choice Begins
New Mexico	Signed 4-8-99	Defined public post-secondary educational institutions and public schools, residential and small business customers on 1-1-2001; all other customers 1-1-2002 (can be delayed up to one year upon commission finding)
New York	May 1996, NYPSC's generic competition decision requiring utilities to file rate and restructuring plans. Between late 1997 and early 1998 the NYPSC approved six restructuring orders. No restructuring legislation passed.	Full retail access begins for Central Hudson Gas & Electric: 7-1-2001; Consolidated Edison: 12-31-2001 or 18 months after ISO fully operational, whichever is sooner; New York State Electric & Gas: 8-1-99; Niagara Mohawk Power: 8-1-99; Orange & Rockland Utilities: 5-1-99; Rochester Gas & Electric: 7-1-2001
Ohio	Signed 6-30-99	1-1-2001
Oklahoma	Signed April 1997. Second restructuring law passed 5-14-98.	By 7-1-2002
Oregon	Passed 7-12-99	Large cust. choice begins 10-1-2000
Pennsylvania	Signed 12-2-96	Phase-in began 1-1-99
Rhode Island	Signed 8-7-96	Phase-in began July 1997 for large cust. A Dec. 1997 RIPUC Order allowed choice for all cust. beginning 1-1-98
Texas	Passed 6-16-99	By 1-1-2002 (IOUs)
Virginia	Signed March 1999	Beginning 1-1-2002, all cust. by 1-1-2004. Can be delayed , but not beyond 1-1-2005

Endnotes

[1] These transition issues, of course, will continue to be fair game for retrospective investigation for many years to come.

[2] For a discussion of the types of market power see Kenneth Rose, "Market Power in the Emerging Competitive Electric Supply Industry," testimony before the U.S. House of Representatives, Committee on Commerce, Subcommittee on Energy and Power, "Electricity Competition: Market Power, Mergers, and PUHCA" panel, Washington, D.C., May 6, 1999.

[3] Conversely, a supplier may have a relatively modest market share in the *overall* generation market but significant market power in some smaller market niche where it has a more significant market share, for example, peak capacity at certain times of the year. This illustrates the importance of properly defining the relevant market.

[4] The nonutility production percentages up to 1970 were calculated from the U.S. Department of Commerce, Bureau of the Census: *Historical Statistics of the United States, Colonial Times to 1970*. Washington, D.C., 1976. After 1970 through 1988, the percentages were calculated from data provided in Edison Electric Institute: *Statistical Yearbook of the Electric Utility Industry*, 1986 and 1991 issues, Washington, D.C., 1987 and 1992 respectively. Percentages from 1989 through 1998 were calculated from U.S. Department of Energy, Energy Information Administration data.

[5] U.S. Department of Energy, Energy Information Administration: *Electric Power Annual 1998*, Washington, D.C., 1999, Tables 3 and 4.

[6] U.S. Department of Energy, Energy Information Administration.

[7] U.S. Department of Energy, Energy Information Administration: *Electric Power Annual 1998*, Washington, D.C., 1999, Table 2.

[8] U.S. Department of Energy, Energy Information Administration: *Electric Power Annual 1998*, Washington, D.C., 1999, Table 3.

[9] The numbers used to calculate the carbon dioxide emission percentages in this section are from the U.S. Department of Energy, Energy Information Administration: *Carbon Dioxide Emissions*, Washington, D.C., November 1999.

Regulation of a Restructured Natural Gas Industry

Preview

The natural gas industry has reason to be optimistic about the future. Significant reforms driven by technological and market events have already transformed the industry to a new dynamic path and, in the future, they will likely move the industry further down the same path. Over the next ten to twenty years we will see increased dependency on natural gas as an environmentally benign source of energy. The demand for cleaner energy in the U.S. translates into a higher growth rate of natural gas consumption relative to the other sources of energy. In the short term, the increased use of natural gas for electric generation will account for much of this phenomenon. Overall, natural gas will position itself in the foreseeable future as a major source of energy in the U.S.

During the 21st century, the natural gas industry will be more competitive, more diverse, and more dynamic than today's industry. The continued momentum toward competition will open the door even further than in the past for a burst of new technologies and business practices. We have learned from other industries that the spur of competition accelerates technological

KENNETH W. COSTELLO *is a Senior Institute Economist and has conducted extensive research and written widely on topics related to energy industries and public utility regulation.*

Mr. Costello's research has appeared in books, technical reports of the National Regulatory Research Institute, the Illinois Commerce Commission and the Argonne National Laboratory, and in scholarly and trade publications.

He has also provided training and consulting services to a number of foreign governments.

innovation and fosters new, and sometimes radical, ways to conduct business.

Regulation is likely to adapt itself to prevailing industry developments. Along with other governmental entities, state regulators will strive to foster competition, protect retail customers from market-power abuses and service-quality deterioration, and maintain certain social objectives funded by gas utilities and their customers. A new regulatory model will emerge both for agency-survival purposes and in response to interest-group pressures. This paradigm shift reflects the alignment of regulation with society's preferences and prevailing market conditions.

The recent global groundswell toward less government and more liberalization of markets has penetrated sectors long dominated by regulation.

Historical Overview

Most people have not noticed the many changes that have transpired in the natural gas industry. Yet, the changes have been monumental and unprecedented in an industry that for decades languished under tighter-than-necessary governmental controls and monopoly dominance. The recent global groundswell toward less government and more liberalization of markets has penetrated sectors long dominated by regulation, including the natural gas industry.

By one perception, the changes in the natural gas industry happened quickly and at times unexpectedly. An alternative perception is that the industry followed a path of linear evolution where predictably the liberalization of one portion of the industry induced competitive pressures in others (see Figure 1, for example). Probably it is correct to say that both are accurate representations—industry restructuring has gone from wellhead to pipelines to the retail market faster than what experts and other industry observers had anticipated; in addition, since 1979, the industry has undergone change at a continuous and rapid rate.

Although certainly not free of transitional problems, the transformation process in the natural gas sector encountered fewer difficulties than in the electric power and telecommunications sectors.[1] Some market participants were required to make major adjustments, causing temporary disruptions. These disruptions, more than anything, reflect the industry's pursuit of greater efficiency and other actions in line with new market and regulatory developments.

The new natural gas industry had its genesis in 1978 with the passage of the Natural Gas Policy Act. (See Table 1 for a listing of major federal

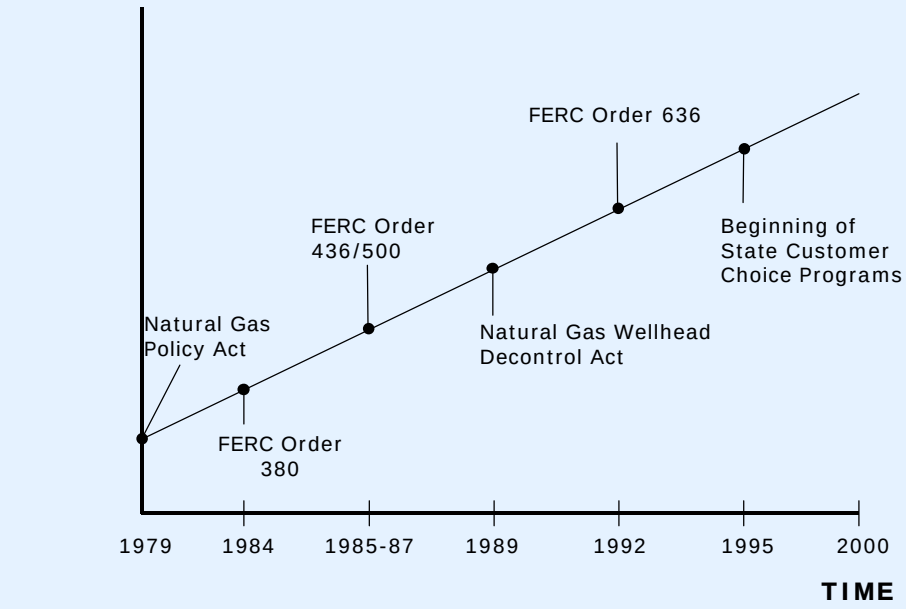


Fig 1. Degree of Natural Gas Restructuring since 1979.

Table 1. Major Federal Actions

1. Natural Gas Policy Act of 1978
2. FERC Order 380 (1984)
3. FERC Order 436/500 (1985-1987)
4. Natural Gas Wellhead Decontrol Act of 1989
5. FERC Order 636 (1992)
6. FERC Pipeline NOPR/NOI (1998)

actions affecting the natural gas industry). Prior to this legislation, the industry was comprehensively regulated from the wellhead to the burner tip. Serious supply curtailments induced largely by wellhead price controls, led to a political consensus for deregulating the wellhead price of gas.[2] The pressures from an open wellhead sector ultimately led to major Federal Energy Regulatory Commission (FERC) reforms that swung open new markets for gas producers through nondiscriminatory access of the interstate pipelines. FERC Order 436/500, in particular, reflected what can be regarded as an inflection point in the evolution of the natural gas sector toward competition. At the time of this writing, FERC had proposed rules to eliminate cost-based regulation for short-term interstate pipeline transportation. The new federal regulatory model has refocused public-interest concerns toward consumer protection and competitive markets. Subsequent to federal reforms, a more liberalized pipeline sector shifted the momentum for change to the retail market. Today, state public utility commissions face the major task of determining whether, and how, to restructure the gas market behind the citygate.

The new federal regulatory model has refocused public-interest concerns toward consumer protection and competitive markets.

The restructured natural gas sector has performed generally as might be expected of an industry enduring a major transformation in the direction of competition. Overall, performance has improved noticeably in several areas. First, benefits to consumers who are able to take better advantage of market opportunities, and consumers having access to an expanded menu of price-service offerings (e.g., customized service under bilateral contracts) have increased. Prices for large retail customers with choice opportunities, beginning in most areas in the mid-1980s, have fallen relative to prices for small customers (see Table 2). For all customer classes over the last fifteen years, the delivered price of natural gas has fallen in real dollars. Overall, gas consumers have benefited by tens of billions of dollars. Second, we have observed the industry to be more cost efficient and productive. Both interstate pipelines and local distributors have taken major steps to reduce operating and maintenance costs, improve productivity, and better align their internal organizations with the competitive environment. Third, prices for those gas services deregulated or subject to more flexible regulation have moved more in line with competitive forces and market realities. Fourth, corporate restructuring has improved the strategic position of firms to better compete in the new market environment. Fifth, service unbundling has grown to allow a larger number

Table 2. Natural Gas Prices: 1980, 1985, 1990, 1998
($/MCF)

	Wellhead	Citygate	Residential	Commercial	Industrial	Electric Utilities
1980	$1.59	–	$3.68	$3.39	$2.56	$2.27
1985	2.51	$3.75	6.12	5.50	3.95	3.55
1990	1.71	3.03	5.80	4.83	2.93	2.38
1998	1.96	3.02	6.82	5.47	3.07	2.37

Source: Energy Information Administration, *Monthly Energy Review* (May 1999), 125.

of consumers to directly access those gas services that can be supplied in a competitive environment.

• Drivers of Change

The traditional three-tier natural gas industry (wellhead, citygate, and local distribution) worked reasonably well until the mid-1970s. Gas prices were low and only increased moderately; gas pipelines and local gas distribution companies were financially intact; and gas service was highly reliable. While some problems occurred, they were minor enough to not instigate any major reform of the industry. There was little interest from any quarter for industry restructuring or increasing competition in the industry.

The old natural gas industry began unraveling when shortages started to appear. By the mid-1970s wellhead price controls induced serious shortages in the interstate gas market. The Federal Power Commission failed to set wellhead prices in the interstate market high enough to avert shortages; that is, the wellhead price of natural gas in the interstate market was below a market-clearing level where demand and supply balance. Signs of supply shortages started to emerge earlier: for each year between 1970 and 1978, proved gas reserves declined to the cumulative level where gas reserves dropped by over 30 percent by the end of this period.

The apex of gas shortages occurred during the 1976-1977 winter when severe curtailments disrupted thousands of businesses and caused unemployment of hundreds of thousands of people. In Washington, a political consensus started to develop around wellhead price deregulation.

The malfunctioning of the natural gas industry, which caused significant consumer welfare losses, can be attributed, at least in part, to

institutional barriers. Wellhead price controls led to crippling shortages; federal pipeline policy obstructed the optimal flow of gas to consumers and regions; and the bundling of different gas services halted competition for commodity gas. At the state level, gas reforms sprang largely from the pressures of large industrial customers to take advantage of opportunities to purchase gas at below regulated rates.

Players at the state level represent a diverse group of stakeholders that has grown over time. In addition to traditional interests such as consumers and gas utilities, they most recently include gas marketers and energy service companies.[3] These new entrants in the industry have ignited much of the recent competitive activities within the natural gas industry. They have also vigorously promoted the idea of "fair competition" where incumbent utilities, their affiliates, and other service providers have equal opportunities to compete.

These new entrants in the industry have ignited much of the recent competitive activities within the natural gas industry.

• The Emergence of a Dynamic Industry

Largely for the reasons cited above, the gas industry experienced a downslide during the 1970s and 1980s. By 1986, natural gas consumption in the U.S. fell by 22 percent from the consumption level in 1970. Since then, however, the gas industry has seen a resurgence driven by new technologies, a robust commodity market, industry consolidation, market hubs, a capacity release market, and new pipeline construction. In sum, these factors are creating a dynamic gas industry with a bright future.

G *New Technologies*

Technology has played a crucial role in the transformation of the natural gas sector. The presence of new and recently developed electricity generation technologies, namely distributed resources and combined-cycle turbines, will during the next several years make natural gas the primary source of fuel for new electric generating capacity. Growth in natural gas consumption during this period will largely come from gas use for electricity generation. Gas is attractive because of its low environmental impact, lower capital cost, and shorter construction lead times in comparison with conventional coal-fired plants.

Technological developments in drilling have helped to keep the price of natural gas down to its current competitive level. Gas discoveries per exploratory gas wells have continuously risen since the 1980s. The cost and risk of drilling have consequently declined. In recent years, reserve additions have exceeded U.S. gas production[4]—another positive development that can be partially explained by technological improvements in gas drilling.

Updated, technically recoverable reserves in North America represent over 100 years of gas supply at current consumption levels.

Technology has also played a role in better accommodating the more complex and unbundled-service transactions now taking place. New information systems have been developed to assist in the electronic switching of retail customers, the transfer of information between marketers and utilities, billing, and meter reading. As one example, the use of the Internet with protocols established by the Gas Industry Standards Board has reduced transaction costs for pipeline capacity release. New developments will continue to reduce the market-transaction costs of both consumers and service providers. Use of computer technologies will facilitate information flow, permitting better price discovery and market knowledge by participants. The effect will assist in strengthening ongoing competitive forces in the provision of value-added services.

Natural gas has the opportunity to become a more important source of energy in meeting the future demands of consumers and the overall U.S. economy.

In sum, technological developments have conferred new life to the natural gas industry. Natural gas has the opportunity to become a more important source of energy in meeting the future demands of consumers and the overall U.S. economy.[5]

G *A Robust Commodity Market*

The commodity gas market has taken on competitive features—a vigorous spot market, a futures market, "arbitrage" profiteering, and movement toward a national market.[6] Currently, about 60 percent of all gas sales are transacted in spot markets. Gas sales have increasingly occurred in an unregulated environment. New pipeline construction will continue to improve interconnections between regional markets and create new markets for gas producers. Internationally, the U.S. now imports over 10 percent of its required gas supplies from Canada. In the next century, Canadian gas supplies may meet as much as 30 percent of the total U.S. demand.

G *Industry Consolidation*

Consistent with the transformation of other industries, the natural gas industry has undergone consolidation. In 1998, $30 billion in convergence mergers transpired, as electric utilities merged with gas pipelines and local gas utilities and several gas providers became national entities. Many corporate mergers reflect the strategy of energy companies to reach out for new profit opportunities in both natural gas and electricity markets. Mergers and acquisitions to establish diversified energy companies will progress. Energy companies increasingly see their future survival and prosperity dependent upon their ability to serve

the “BTU” market, rather than just the natural gas or electricity market.

In concordance with mergers and acquisitions, we will see an industry composed of “tier one” and “tier two” companies. Tier one companies can be described as full-service entities, with a national presence; tier two companies represent those entities trying to establish themselves as profitable niche providers concentrating on specialized products and services within a confined geographical area.[7]

In concordance with mergers and acquisitions, we will see an industry composed of “tier one” and “tier two” companies.

G *Market Hubs*

Like the airline industry, the pipeline sector has seen the emergence of market hubs. Currently, the U.S. has forty gas transportation hubs, with pipelines coming together to provide new services and to ease market constraints for both gas commodity and pipeline transactions. Market hubs make available numerous interconnections and paths to move gas from the wellhead regions to markets. We have also seen the emergence of transactional trading areas, which are called market centers.

G *Capacity Release Market*

Following FERC Order 636, pipeline capacity has been traded among customers in a secondary market. Specifically, a customer under any firm rate tariff can release its capacity on a short-term or long-term basis. The capacity release market has intensified competition in the pipeline market; it has done so by lessening monopoly power on pipelines through an increase in the number of participants competing to sell capacity. Rates for pipeline service have declined, along with an improvement in utilization and operations. Since its inception, shippers have saved billions of dollars from rates being driven below the tariff “list price” level.

G *New Pipeline Construction*

Since 1996, annual gas pipeline investments have increased significantly. During 1997-1998, more than eighty natural gas pipelines were completed, expanding the ability to transport gas between regions. New pipelines have allowed gas from new and existing domestic, Canadian, and Mexican production areas to reach new markets. During the year 2000 expenditures on pipeline construction could exceed $6 billion.[8]

• A Paradigm Shift for State PUCs

The functions of regulators have changed in the new, dynamic market environment. In addition to their traditional duties, regulators have assumed an important role during the transition in fostering competition. The new dichotomy of services, where some are monopolistic and others are naturally competitive, requires regulators to establish a bifurcated or hybrid system of oversight. As an example, for noncompetitive or natural-monopoly services, regulators will continue to set prices, although perhaps differently than in the past. For competitive or emerging competitive services, regulators will either allow more price and service flexibility, or relieve themselves from price regulation, but will still oversee market activities. The objective of market oversight will be to ensure consumer protection against the dangers of anticompetitive practices and to foster efficient competition. The demand for this regulatory function arises out of the incumbency advantages of franchised utilities and possible market-power abuses by new entrants.

The new dichotomy of services, where some are monopolistic and others are naturally competitive, requires regulators to establish a bifurcated or hybrid system of oversight.

Supporters of the new regulatory paradigm point to its desirability when compared with the traditional regulatory model. One can argue that this new model is already displacing the old model. The emerging model has several features. First, a bifurcated pricing system would combine traditional pricing methods for "captive market" services with more flexible or market-based pricing for other services. Second, regulatory monitoring and evaluation would guard against market-power abuses by a utility or its affiliate and by other suppliers over which a regulator has jurisdictional authority. Third, regulatory oversight would assure no pronounced deterioration of a utility's quality of service which may result from strong incentives to cut costs. Fourth, affiliate rules and codes of conduct would be implemented to prevent abuses from utility-affiliate interactions. One objective of such rules is to eliminate artificial barriers to entry and, in the process, promote effective competition. Fifth, generic consumer protection rules would prohibit activities by jurisdictional entities from harming consumer interests. Sixth, service unbundling rules would shape the form and execution of customer choice programs; these rules pertain to market certification, consumer education, consumer eligibility, pipeline capacity assignment, and so forth.

In the years ahead, a multitude of challenging questions will confront state regulators; the major ones include:

(1) Will customer choice programs benefit small retail customers; if so, by how much?
(2) How many small customers will participate in choice programs?
(3) Have the past experiences of customer choice programs been encouraging or discouraging?
(4) Will service reliability and quality decline in a more competitive retail market?
(5) What is meant by fair or effective competition? How can it be achieved?
(6) What information can be drawn upon to know whether the retail gas market is functioning well and in the best interest of retail customers?
(7) What market activities should be monitored by regulators?
(8) Should gas utilities remain in the gas merchant business?
(9) Should a gas utility be the default supplier or the supplier of last resort?
(10) How should proposals for corporate mergers and acquisitions be evaluated?
(11) How should prices for new unbundled services be set so as to meet both traditional and new regulatory objectives?

Unquestionably, these questions offer imposing challenges for state regulators. How regulators respond to them will have a significant effect on the future developments of retail gas markets. State regulation will require new skills and, like the industry itself, a reevaluation of its policies and practices.

Table 3 lists the ten "hot topics" of current interest to federal and state regulators. They pertain to questions relating to market power, ratemaking, customer choice, potential stranded costs, and future functions of gas utilities. The topics cover those activities found to be typical for a formerly heavily-regulated industry undergoing transformation toward more competition.

Table 3. Ten Hot Topics
in the Natural Gas Industry

- Rate design for unbundled gas services
- Utility-affiliate codes of conduct
- Risk management
- Pipeline and LDC market power
- Service unbundling to small gas customers
- Role of LDCs as gas merchants
- Pipeline ratemaking
- Performance-based regulation
- Pipeline capacity turnback
- Corporate mergers and acquisitions

• Customer Choice Programs

The traditional retail model is unraveling at different speeds across the U.S. In some areas, small customers currently have direct access to natural gas from marketers; other areas, which have only permitted large customers to directly access suppliers, are more skeptical as to whether small customers would benefit from direct access. Their thinking is that local gas utilities can continue to act as effective aggregators in purchasing competitively priced gas in the wholesale market. They argue that changes in utility incentives, for example through performance-based regulation (PBR), may only be required to achieve the maximum benefits to small retail customers.

Looking back on the experience of customer choice programs, expectations were probably largely realized.

The evidence from customer choice programs suggests that benefits to small customers may be small or nonexistent. Thus far, we have had less success in small-customer choice programs than what was seen in opening up wholesale and large-customer markets. But this should not be surprising: small customers would be less inclined to switch to new gas suppliers in view of high transaction costs relative to potential benefits. Skeptics of choice programs for small customers argue that they are no more than a zero-sum game; specifically, marketers would benefit at the cost of imposing additional risks on gas utilities and their captive customers, which translates into little or no aggregate social gains or improvement in economic efficiency.

Looking back on the experience of customer choice programs, expectations were probably largely realized. We did not expect massive switching by small customers, especially during the initial years, and generally we have not seen it. Few people would argue, however, that the experiment has failed. The general feeling can be summed up as, “we have learned much and the results for many if not most programs are encouraging enough to move ahead.” The experiment with small-customer choice requires further refinements and new approaches to be regarded as an unequivocal success. The transitional period may take several years to complete, but the general thrust is toward a commitment to making the retail-choice model work for all customers, both small and large.

In the future we should see more choice programs for small customers. These programs will be implemented on a larger scale than past programs, which can be characterized as first-generation pilot programs. We have learned enough from past and current programs to justify bypassing the experimental nature of the earlier ones.

We can also expect better performance in the future as the market matures. Marketers and

other participants will continue to look for ways to reduce customer transaction costs, and uncertainty for both marketers and consumers will diminish. One lesson learned is that transaction costs to small customers need to be minimal before they will switch to another supplier: customers will not tolerate spending much time on something that they generally deem to be insignificant.

We may be at a juncture where a study to measure the actual benefits to small customers is warranted. We have accumulated much data and the jury is still out on whether choice programs, overall, have been good for small customers.

The natural path for future choice programs is to allow for the unbundling of more retail gas services, especially those that would add value to customers. These third-generation programs have the potential to lure a greater number of marketers and to produce greater benefits to customers. The feasibility and economics of offering value-added service is currently under review by gas utilities and regulators.

Conclusion

Much work remains to be done to finish the task of gas industry restructuring. The transitional phase of the industry toward a steady state will continue for several years. The industry will realize as-of-yet unexploited efficiencies. Future benefits to consumers from further industry adjustments may be significant.

FERC and the states need to further refine their new role in shaping the market environment. They will face the difficult challenge of developing a regulatory system that accommodates and fosters competition and, at the same time, protects customers from possible market-power abuses. In other words, regulators will have to perform their tasks in a bifurcated market environment: traditional policies will no longer work but complete displacement of them will be rash, especially as the industry moves on the path of full adjustment.

The natural path for future choice programs is to allow for the unbundling of more retail gas services, especially those that would add value to customers.

State regulators will grapple with how to protect small customers and achieve social objectives that they have long held sacred. They will concern themselves with service reliability and quality of service, consumer education, market-power abuses, service affordability to low-income households, and equal market opportunities for competing service providers. Contrary to the prediction and perhaps wishes of some observers, regulation will not fade away or die. Instead, regulation will remold itself to perform new functions and goals under a revamped paradigm. The transformation of the

natural gas industry will require regulation to also transform itself. Otherwise, it risks becoming irrelevant in serving the public interest.

The future of natural gas looks particularly bright. Technological developments on both the demand and supply sides will increase the significance of natural gas in the U.S. economy. Predictions call for the natural gas market to grow by 35 percent over the next ten to fifteen years. Achieving this level of "a 30-Tcf market" constitutes a milestone in the industry.

Market developments toward more competition promise to pay dividends for consumers and society as a whole. Federal and state regulation will play a crucial role in achieving these potentially significant benefits.

Regulatory institutions will need to adapt to, and at times lead, the market-oriented developments in the natural gas industry. The indication is that they will as a response to the strong market forces pressing vigorously for change. Some state regulators will understandably proceed more cautiously than others.

Recent developments in the electric power sector have had a significant effect on the natural gas industry. They have stimulated an increase in the demand for gas-fired electricity generation and subsequent increased pipeline construction, higher natural gas prices, and convergence mergers involving both electric and gas companies. As restructuring progresses in the electric power sector, these effects on the natural gas industry will be accentuated. On the reverse side, gas companies and their affiliates have begun to exploit their risk management, trading, and energy marketing expertise in the electric market. Convergence between electricity and natural gas markets will continue to proliferate in the future.

Endnotes

[1] One problem was the severe take-or-pay contract problems of the early- and mid-1980s. Although the market price for wellhead gas was far below contract prices, pipelines were obligated to pay the latter. Other transitional problems have included leveraging by incumbent pipelines, uneconomic bypass, and changed risks to market participants.

[2] The oil price shocks of the nineteen-seventies aggravated gas shortages as oil users wanted to switch to gas.

[3] Gas marketers and energy service companies are either independent or affiliated with a regulated public utility. Some own gas network assets, while others do not.

[4] During the period 1994-1997, reserve replacement in the U.S. exceeded gas withdrawals by 7 percent.

[5] Other new technologies that will increase gas consumption include natural gas vehicles, gas air conditioning, and distributed generation.

[6] Natural gas futures contracts began trading over ten years ago. Today, thousands of these contracts are traded on a daily basis.

[7] Even today we have regional and national gas and energy marketing companies.

[8] Much new storage capacity is also expected over the next several years.

State Commissions In the Global Telecommunications Revolution

- ***VIVIAN WITKIND DAVIS*** *is Associate Director for Research. She is currently working on NARUC-sponsored research on successor regulatory regimes in telecommunications and alternatives for dealing with number exhausts. She has authored or co-authored numerous reports on telecommunications and water regulation. She received her Ph.D. from the Ohio State University, School of Public Policy and Management.*

- ***FRANK DARR*** *is a Senior Telecommunications Researcher . He is working on projects involving market power and interconnection standards. He received his law degree with honors from the Ohio State University. He worked in a private law firm for several years and moved on to serve as an assistant attorney general in Ohio; a tenured associate professor at the Fisher College of Business, the Ohio State University; and Legal Director of the Ohio Consumers' Counsel. He has published many articles on utility law in leading law reviews and was a two-time Ameritech research fellow while at Ohio State.*

State telecommunications regulators have a tough job in the early days of the new century. As always, they are dedicated to economic efficiency, economic development, equity and consumer protection in their jurisdictional spheres. Yet they face a global telecommunications revolution that is sweeping across boundaries. In 1999 the state commissions and the Federal Communications Commission (FCC) took substantial steps toward filling in the gaps in a transition to competition in the U.S. local telecommunications market called for by the Telecommunications Act of 1996.[1] But vast changes in how information, including encoded voice communication, is stored, shaped and delivered are quickly overshadowing the effort to continue the incremental process of effectuating the four-year old Act and crafting a transition from regulation of sheltered monopolies to a competitive era. The cynosure of the telecommunications revolution is the Internet, which is routinely compared with the most far-reaching communications advances in human history, such as the invention of the alphabet or Gutenberg's printing press. The printing press was invented in the mid-15th century; the Internet, the late 20th century.

The printing press revolutionized business, politics, education, and entertainment but no one in the 1400s could have predicted how. The Internet is revolutionizing business, politics, education, entertainment, indeed all of society, at seemingly warp speed and power. We cannot be sure how, despite the deluge of statistics, prognostication and hype. Huge corporations and innumerable start-up companies are trying to figure out how to capitalize on the new opportunities—or be left behind. The job of government is to facilitate change and preserve and foster democratic and consumer protection goals. For the states the problem is to do so while traditional boundaries, including state boundaries, become more and more porous.

Commissions will shift even more from thinking and acting as regulators of monopolies to facilitators of local telecommunications markets.

The year 1999 began with a seminal Supreme Court decision that validated FCC authority to set pricing policy for interconnected networks. It ended with a victory for competition, consumers and the principal method established by the Act to open local telecommunications markets: After an arduous process undertaken by the New York Public Service Commission, the FCC gave Bell Atlantic in New York its first approval to enter long-haul, long distance in a state. Other major actions were taken at the state and federal level aimed at enhancing "universal service" (or availability of affordable telecommunications service to every American) and protecting consumers from compromised service quality and monopoly rates.

Local competition will continue to unfold in 2000. Business customers already can choose providers in many cities. Particularly in urban areas, residential customers will begin to have more choices among providers of local telephone service. Commissions will shift even more from thinking and acting as regulators of monopolies to facilitators of local telecommunications markets characterized by a dominant firm and several smaller competitors. Yet the situation is more complex than the model of a dominant firm and competitive fringe, since the companies are multiproduct firms in overlapping markets. In the meantime, since monopoly provision of basic local service is still the norm, many commissions will be modifying price cap plans and other regulatory regimes to provide adequate protection for consumers and adequate flexibility for changing market structure.

One of the biggest jobs of state commissions will be to oversee the renewal of interconnection agreements between incumbent carriers and their competitors, many of which expire in the next year. In this second round of contracts we may well see a trend towards standardization of key terms.

States face major policy decisions on universal service, including hard choices about establishment, funding, and distribution of

universal service support from their own universal service funds. In 2000, states and the federal government will grapple with restructuring the systems of access charges and separations of state and federal revenues that have served as underpinnings for universal service funding.

States and the federal government will grapple with restructuring the systems of access charges and separations.

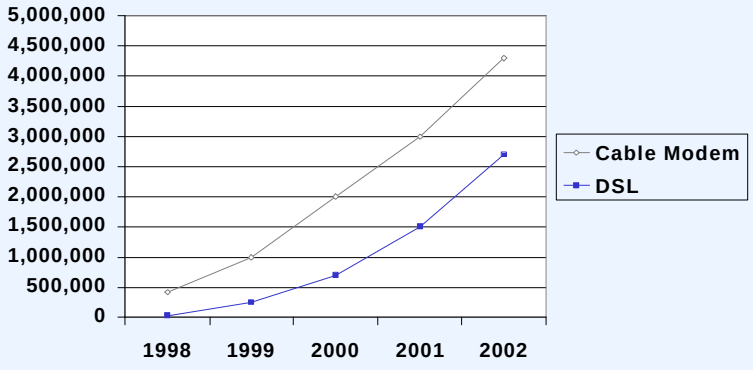
State policy in 2000 will be more closely linked than ever to national policy, necessitating new approaches to cooperative federalism. Threading through the commissions' efforts to craft policy that meets state and national goals will be convergence of technologies and industries to capture the promise of prosperity and progress from the Internet and other telecommunications innovations.

This report ranges widely over the actions and decisions in telecommunications that affected state regulatory commissions in 1999 and into 2000. It is not intended to be exhaustive—that would be impossible—but is quite comprehensive. Some of the data were only available through 1998; enough information is provided in the citations to allow a reader to check for similar data as it becomes available in 2000. All dates in the report that show only the month and year refer to 1999.

• Technology

Technological change is the driving force in the telecommunications revolution. Many different technologies and types of networks can provide voice telephone service, with new ones arriving seemingly every year. Copper telephone lines provide basic telephone service and 97 percent of Internet connectivity today, but one projection sees them as the conduit for only 64 percent by 2002.[2] The relatively narrow bandwidth of today's modems is being replaced by much faster alternatives such as cable modems, digital subscriber lines (DSL), T-1 lines, satellites, fixed or mobile wireless, or fiber optic cable. Penetration rates for cable modem and DSL services together amounted to half-a-million households in 1998, according to a Yankee Group report, but are expected to total close to 4.5 million and half-a-million respectively by 2002 (see Figure 1).[3]

Figure 1. Deployment of Cable Modems and DSL



Source: Yankee Group, as cited in *Maximum PC,* October 1999.

Moreover, the Internet may displace large parts of the circuit-based telephone network. A 1997 study predicted voice traffic over the Internet could become a $63 billion market by 2002.[4] Internet telephony will require data networks to provide "real time" communications. Current standards tolerate delays caused by congestion or the need to retransmit lost packets of information. To be intelligible, voice transmittal does not admit of delays or lost information. Quality of service improvements are inevitable.

• The Industry

The telecommunications industry is enormous and growing. The Council of Economic Advisors in 1999 reported that communications services and equipment companies (the conduit providers) increased revenues to $408 billion in 1998 from $250 billion in 1993, and created approximately 200,000 new jobs.[5] Phillips Business Information projects industry-wide growth for telecommunications of 11.4 percent in 2000, with local network services growth estimated at 5.8 percent, substantially lower than the overall industry growth rate.[6] The largest ILECs are GTE and the four remaining Bell operating companies—Bell Atlantic, BellSouth, U S West, and SBC. GTE and Bell Atlantic are in merger proceedings. Commissions also regulate some 1,400 other companies, most of them small and rural.

The wireless telephone industry, where commission authority is slight, is booming.

AT&T, MCI/WorldCom, and Sprint control 80 percent of the interexchange market. The market shares of smaller carriers has grown quickly, increasing to 20 percent from 3 percent since 1984.[7] Prices and average revenue per minute have declined for the long distance carriers, while overall usage and total revenues have increased dramatically.

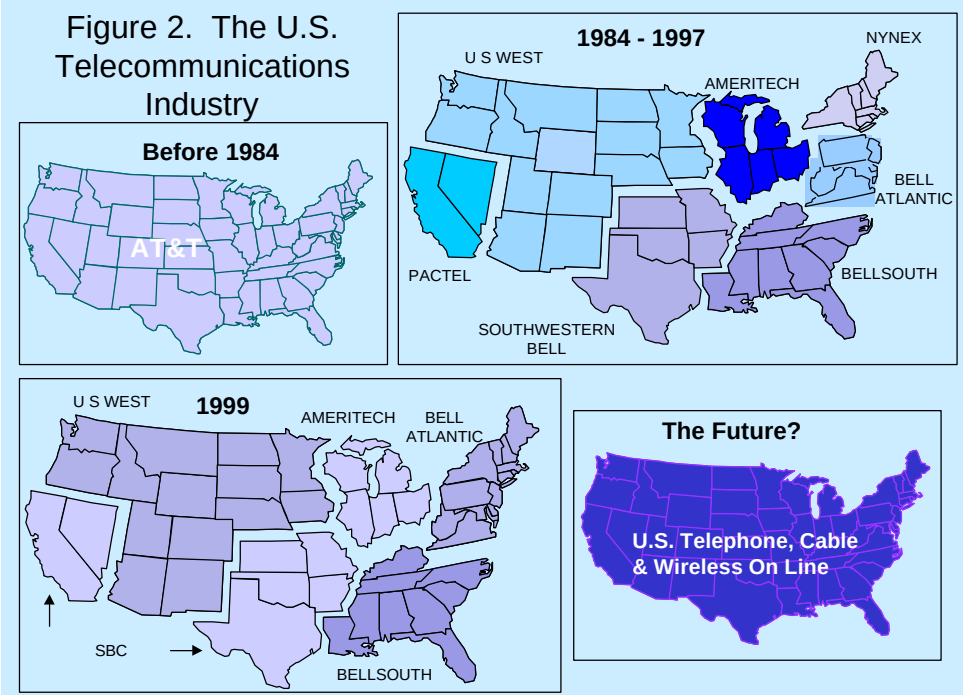
The wireless telephone industry, where commission authority is slight, is booming. The Cellular Telecommunications Industry Association reported that U.S. users increased 25 percent in 1998 to 69 million people.[8] The price of wireless service has dropped 40 percent in the last three years.[9] The largest wireless companies in number of subscribers are AirTouch, AT&T, SBC, Bell Atlantic, and BellSouth.

The cable television industry by the end of 1998 comprised 171 national networks. Cable lines pass 96,000 households, and more than 65 million households subscribe to cable TV service.[10] Probably the most remarkable business development in 1999 is the transformation of AT&T into primarily a cable company, and in fact the nation's largest one, accomplished through acquisition of Tele-Communications, Inc. and a planned merger with MediaOne Group, representing an investment of more than $100 billion. Changing AT&T from an interexchange carrier to a primary provider of all kinds of convergent digital telecommunications is a huge challenge: "A failure to deliver on that gamble would not only represent a spectacular waste of shareholders' money but could also throw the company's entire strategic future into doubt," wrote Seth Schiesel for the *New York Times*. "If

AT&T's cable strategy fails as long distance competition increases, venerable old Ma Bell could well go down for the count."[11]

The AT&T quest for a winning strategy in the telecommunications revolution and the latest proposal for a merger of Time Warner and America Online are two examples of a feverish trend. All sectors of the telecommunications industry are working to find their way into the market for broadband data services. There are bound to be both winners and losers in the telecommunications revolution. To try to become the winners, companies are invading each other's businesses or pursuing mergers and acquisitions. As the barriers to entry into various markets have been eliminated, firms are acquiring or merging with firms horizontally (SBC with Pactel, SNET, and Ameritech; WorldCom and MCI; Bell Atlantic with Nynex and with GTE) or vertically (AT&T and McCaw Cellular, AT&T and TCG), and in surprising new ways (AT&T and TCI).

Figure 2 is a whimsical view of the evolution of the telecommunications industry from a state regulatory perspective. What is to come? Will regulators have any leverage over the developing mega-companies, which are only in part conduit companies and also provide content and Internet services? What about the international scene? Regulated U.S. telecommunications firms are deeply into international ventures. The 1999 World Trade Organization pact to open up China's vast telecommunications market is the latest opportunity for American companies and others. It is of long-run national importance that state



commissions do not somehow inhibit the ability of American companies to compete in world markets.

• Convergence

"Convergence" is integral to the changes that are taking place in telecommunications. Although often referred to as the defining issue in communications regulation, the term means different things in different contexts. A noted sense that a single source can support many different communications and entertainment services. "Convergence" also refers to the above, the technologies are converging, in the migration of different utilities into each other's businesses. In addition to cable entering telephone and vice versa, there are now electric and gas companies using and expanding their communications systems for their own and others' use. In this sense, industries converge in the provision of information.

Convergence is driven by notable changes in the way information is created, moved, and stored.[12] First, information is being digitized. "[D]igitization refers specifically to the process of converting some quantity, which may be continuous, to a representation that is discrete."[13] Voice, video, and text—the common forms of information—can be easily digitized.[14] The creation of digital copies, however, often requires enormous computing power. Although compression techniques are constantly improving, the amount of digital data from simple sites on the World Wide Web are accused of creating the World Wide Wait.

In response to greater information flows, the second factor affecting convergence is ever faster means of moving data–bigger pipes. For most Americans connected to the information superhighway, the current pipe is a relatively slow modem. Numerous technologies with much faster capabilities are expected to be the norm in a few years.[15] The greatest gains are likely to be in fiber technologies.[16] One observer predicts, "By 2009, offices, as well as schools, libraries and most households, will be served by fiber optic links that connect them to the world's networks at speeds hundreds of times faster than today's fastest dial-up modems."[17]

Third, information technologies are becoming more ubiquitous. The expectation that more computing power will exist in the traditional communications devices such as computers, televisions, and personal digital assistants represents only one part of the increasing use of low cost computing and networking. "In the next decade (thanks to Moore's Law[18]), computers will become so small and inexpensive that each of us will have hundreds or thousands of computers at our disposal. Most of these will be invisible, embedded in all sorts of common devices in our environment, making them more versatile and more useful."[19] Moreover, these devices will be interconnected through various networks, making access to information possible from any location.[20]

Finally, information systems are becoming increasingly intelligent:

> [V]oice recognition technologies will free users from having to rely on typing on a keyboard to send messages. Natural language systems will allow users to ask a question in their own words and get an answer in a form they can use (rather than their simply entering a word or phrase in a "search engine" and getting a list of links to pages that contain the term). Software-based "agents" will be available that "know" a user's preferences and carry out a range of tasks on his or her behalf without the user having to be present. Automated translation systems will eliminate the barriers that exist between people who speak different languages. As these tools emerge, we will begin to realize the real promise of the information age.[21]

As remarkable as these possibilities are, it is impossible to say what the next "killer" application might be. Greater intelligence, however, is expected to drive ever more interesting uses of the information network. Many observers believe that customers are seeking a single source for increasing demand for communications and entertainment services. One commenter explained:

> The strategy is to provide the set-top computer with a personal remote control that networks not only the television set, but all consumer information appliances, including the telephone and personal computer. This network will furnish the user's home with zoned information access in the same way that a central heating system provides zoned heat. The goal is to create a winning scenario for consumers and service providers. The end user wins because bundling and cross-subsidization reduce costs and combining all three networks in the home provides unique technological results. The operator wins because common operations platforms are integrated into an easily manageable digital broadband network.[22]

• Competition

The Telecommunications Act of 1996 was the first comprehensive revision of the Communications Act since it was first passed in 1934. The purpose of the 1996 Act is to "promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies."[23] A number of states opened markets to competition before the Act was passed, but since February 8, 1996, all states have been grappling with execution of the Act's requirements. Markets today are indeed open but not necessarily competitive. Competition is slowly beginning to develop, sometimes in new, unexpected ways. The question for many

Customers are seeking a single source for increasing demand for communications and entertainment services.

observers is whether it is happening quickly enough.

This year is likely to be the one in which competition in local telephone service begins to take hold. Residential customers in New York City are beginning to get cold calls to switch their local service. The streets of Washington, D.C., are striated by the filled-in trenches of companies that have laid wires. These beginnings are the vindication of years of work by the states and the FCC. Though telecommunications may never be competitive the way farming or gas stations are, we can realistically envision a day when residential users will have several choices of telephone providers. State commissions are helping make that happen in a way that assures a continued, interconnected public switched telecommunications network.

The Act provides three methods for competitors to get into the local telephone business. The first is resale, or the purchase of existing services at wholesale prices. Lines provided by large ILECs to CLECs for resale amounted to 1.9 percent of total national access lines in December 1998, according to the most recent report by the FCC's Industry Analysis Division on *Trends in Telephone Service*.[24] The resale approach, which policymakers hoped would jump-start competition, has largely failed, presumably because the discount margins have not been sufficient to encourage competitors to enter the market via resale.

The second method of entry established by the Act is interconnection, including the purchase of unbundled network elements, such as the local loop or switching. The states have played a key and very successful role in overseeing agreements between ILECs and CLECs to interconnect. Thousands of interconnection agreements have been completed across the United States, many of them arbitrated by the state commissions as called for by the Act.

Building new networks is the third form of entry available to companies entering local telephone markets. Information on the extent of facilities-based competition is fuzzy: A 1998 FCC report said that "some industry observers believe" CLECs provide about a quarter of their customer lines over their own facilities, about four to five million lines, or less than 3 percent of nationwide switched access lines.[25] The FCC is developing better ways of gathering information on the growth of competition.

The FCC concluded that CLECs are gaining market share, but still have less than 5 percent of the local market. CLEC revenues are increasing rapidly, and ILEC revenues are increasing, too, but less rapidly – they have a smaller part of a bigger pie. ILECs claim 96 percent of local service revenue in 1998, down from 98 percent in 1997. This is a small but significant change. CLECS reported $2.4 billion of local service in 1998, up from $80 million in 1993.

An indicator of competition yet to come is the relatively high level of presence of CLEC facilities in ILEC switching centers. The percentage of ILEC lines served by switching centers where new entrants have collocation

arrangements was 29.5 percent in 1998 (a weighted average based on lines served).

Competition is beginning, and with it a movement towards a different market structure than the old monopolies. We can begin to look at local telecommunications markets as dominant firms and a competitive fringe of players, just as the long distance market was in the transition period from divestiture to the late 1990s. Commissions are playing a role in moving the transition ahead by approving entry of Bell companies into in-state long distance service under Section 271 of the Act, by approving and renewing interconnection agreements, by participating in construction of merger conditions where they have that authority, and by developing monitoring and enforcement mechanisms that make sure the new markets work.

• Bell Entry Into In-Region Long Distance

The FCC, in late December, authorized Bell Atlantic to provide long distance service in New York, the first such approval almost four years after the Telecommunications Act of 1996 set up a method for the Bell operating companies to enter in-region long distance. FCC approval followed years of excruciatingly detailed effort by the New York Public Service Commission and Bell Atlantic to satisfy the requirements of the Act that the company's local telecommunications market be fully open to competition. Not everyone is satisfied with the approval. A *New York Times* editorial questioned whether a few months more of effort would have better ensured that Bell Atlantic can fully welcome competitors to its networks and systems. AT&T immediately called for a stay of the approval—and was turned down. But the New York decision gives the rest of the country a solid model on which to base their own efforts at in-region long distance entry under Section 271 of the Act. We can expect to see a wave of approvals in 2000. The Texas Public Utilities Commission in December approved the SBC application to begin long distance service in the state.[26] Pennsylvania and Massachusetts are reportedly not far behind.

FCC approval followed years of excruciatingly detailed effort by the New York Public Service Commission and Bell Atlantic.

The most difficult hurdle in the New York application was assurance that the incumbent's operations support services (OSS) would support competitors. Unbundling of OSS and nondiscriminatory access to its functions is essential for competitors to be able to take orders from customers, install service, maintain and repair their own facilities, and bill their customers. The New York commission retained KPMG Peat Marwick to conduct a third-party test of the OSS quality Bell Atlantic would be providing to competitors. Other states are pursuing third-party testing of OSS. Thirteen of the fourteen states served by U S West are

participating in a regional third-party testing effort that is scheduled for completion in 2000. Other regional efforts may be considered, as states with fewer resources than New York make certain there is no rush to judgment on fulfilling the requirements of Section 271 and attempt to ensure that other companies in other states are held to standards that assure competition has a chance to take hold.

• Interconnection

In order to continue to have one smoothly running public switched telecommunications network, ILECs and CLECs must be able to work together to provide an interconnected system, and eventually an intermeshed "network of networks." State commissions play a role in making sure that new technologies and providers interconnect with existing local telephone companies to create the network of networks.

The year began with a seminal decision on telecommunications regulation by the Supreme Court. The impact of the January 25 decision in *AT&T v. Iowa Utilities Board* is still unfolding, with major implementation steps still to be decided in 2000.[27] The Court gave authority to the FCC to set the rules for pricing of interconnection. The states and Bell companies argued that pricing of interconnection was under state jurisdiction because Section 152(b) of the Telecommunications Act of 1996 gives states authority to set intrastate rates. Preservation of Section 152(b) was a major achievement of the states in influencing the provisions of the Telecommunications Act, so as to maintain a strong state role. The Supreme Court decision, in ignoring the presence and legislative history of Section 152(b) gave state pricing authority a sharp blow. The Court ruled that the general thrust of the Act is to give the FCC, not the states, authority to promote competition. The Court did not decide that Section 152(b) is a "nullity," but that states no longer have exclusive control over all local rates. Most states were already using some form of forward looking pricing, as called for by the FCC. The extent to which the state methodologies conform to FCC requirements will be answered in the coming year. The FCC's hand has been strengthened: "Cooperative federalism" will be getting a little cozier.

The Supreme Court decision also overturned an FCC rule that forced ILECs to provide access to network elements, on the grounds that the FCC did not consider whether access for each part was necessary to promote competition and whether CLECs would be impaired by having to acquire a network element themselves. The FCC rule forbidding the ILECs from separating already combined network elements was upheld. Pursuant to the Supreme Court's remand, the FCC adopted a framework for analyzing impairment on a regular basis and removed operator services and directory assistance from the list of unbundled elements that must be offered to competitors. States may adopt additional UNEs that comport with the national standards. The Commission said that unbundled network elements must be deaveraged into at least three price zones—typically urban, suburban, and rural. Unbundled network elements are likely to be more

expensive for rural areas than urban ones. It is good for competition to have prices of unbundled network elements represent their true costs, since competitors will know what the tradeoffs are between buying the elements and supplying them themselves. But deaveraging raises questions of whether or how much rates should change in rural areas to reflect underlying costs, and how much of a subsidy there should be under universal service to make sure that rural rates remain affordable.

The Court reinstated the "pick and choose" rules (most favored nation), allowing a CLEC to choose the terms it wants from previously existing interconnection agreements. The Eighth Circuit had said a contract as a whole represented negotiations on various provisions, with tradeoffs within the document, and it did not make sense for a competitor to be able to pick an isolated term out of other contracts without regard for those tradeoffs. The Supreme Court said whether or not it made sense for competitors to "pick and choose" the terms they liked from other interconnection agreements, the Act clearly allows it. How competitors go about exercising their right to pick and choose should be of great interest as many existing interconnection agreements come up for renewal in 2000.

One of the touchiest issues in renewing interconnection agreements is reciprocal compensation.

The Court did not rule on the merits of the FCC's forward-looking cost methodology, just on the general question of jurisdiction. The substantive merits of the FCC pricing rules was remanded to the Eighth Circuit for consideration. Oral arguments began in 1999 with ILEC criticisms of the FCC proposal. The content and flexibility of FCC pricing rules for interconnection are a major question facing the states in 2000.

One of the touchiest issues in renewing interconnection agreements is reciprocal compensation between ILECs and CLECs that have made a business of serving Internet service providers. Internet traffic flows one way, but many agreements were set up as if traffic to and from the CLEC would cancel each other out. Most states have ruled that calls to a CLEC that end up with an Internet provider are local and that the existing interconnection agreements are binding. The result is that the CLECs have reaped revenues unexpected when the initial agreements were signed.

• Mergers and Acquisitions

Merger fever in the telecommunications industry creates concerns for regulators, including whether the combined firm may have increased market power, whether regulators will have as much ability to regulate the larger enterprise, and how consumers will be affected. If two potential competitors merge, will there be less competition in their "home" markets than would

have occurred without the merger? How can consumers expect to share in the predicted benefits of the merger? How can you measure competition and thus apply an antitrust test when one or more of the merging firms is still largely a monopoly?

In order to gain FCC approval for their merger, SBC and Ameritech agreed to conditions to open their local markets to competitors and create competition in others. They agreed to enter thirty of the fifty largest metropolitan local markets outside their combined home territories as a CLEC.

• Special Problems in Competition

Competition to incumbent telecommunications providers comes from several directions. In addition to the more traditional players and newer network companies, providers are active in other network industries such as gas and electric companies. At least sixty energy utilities have announced telecommunications plans ranging from construction to local service. A whole range of problems from certification to affiliate transaction rules to service quality issues are presented by these entrants.

Opening markets has also created opportunities for niche sellers. Ironically, the initial residential competition came in the form of prepaid resale. Often these resale services come at a hefty price, and the resellers frequently requested waiver of quality-of-service rules. Commissions have reacted to these services in a variety of ways and many are struggling to determine the right mix of regulation and competition.[28]

• Federal Preemption

The most basic job of the commissions is, like physicians, to do no harm, that is to avoid putting barriers in the way of competitive entry. The end of 1999 included several FCC decisions under Section 253 of the Act, which prohibit entry barriers. The Commission ruled that an Arkansas law set up barriers to entry for competitors. The Commission said, among other things, that the law allowed the ILEC to withhold bundled retail service at retail rates, let the state commission allow the local company to use generally available terms and conditions that did not comply with the Act, and protected rural telephone companies from competitive entry. The FCC in part granted petitions that it preempt and assume jurisdiction of the Arkansas Public Service Commission over all proceedings conducted under Section 252, the interconnection arbitration section of the Act. Another FCC preemption decision concerned access to rights of way in Minnesota and a court early in 2000 backed an FCC decision on preemption of a Wyoming law.

• Preventing “Backsliding”

One of the most important commission functions going forward into the age of competition will be to monitor carrier-to-carrier quality of service and institute meaningful penalties if necessary. The New York Public Service Commission, for example, has developed carrier-to-carrier performance

measures and service quality standards as conditions of Bell Atlantic's approval under Section 271, and will continue to gather consistent, meaningful data on Bell Atlantic's service to competitors. The commission's performance assurance plan gives financial incentives for Bell Atlantic to keep providing good service to competitive LECs. The SBC-Ameritech merger order establishes a "self executing" compliance mechanism, an independent audit of compliance with merger conditions, and self-executing remedies for failures to meet obligations. The conditions expire after three years.

• Regulation of Residual Monopolies

As competition develops, the market power of old monopolies will shrink and with it the necessity of commission oversight of prices. In the meantime consumers continue to need protection from monopoly pricing. It took twelve years for AT&T's share of the long distance market to erode to less than 50 percent from 90 percent of total toll revenues at divestiture; it would not be surprising if it takes another eight to ten years for ILECs to become nondominant carriers in most of the United States.

The application of traditional regulatory methods ("ratebase, rate-of-return" regulation) has been shrinking for over a decade. Most commissions are regulating the monopoly providers through price caps and rate freezes and letting go of services or service areas as they become competitive. But local telephony is an essential service in today's world, and is still largely a monopoly. Commissions are taking steps to assure that customers are protected from monopoly pricing.

The most frequent form of regulation of monopoly services in the United States is price caps or price caps with a rate freeze (Table 1). In 1999, Illinois, Indiana, and Pennsylvania renewed their price cap/ incentive regulation plans. New Jersey extended their plan for an additional year. Price cap plans coming up for renewal in 2000 include those in Alabama, the District of Columbia, Maine, Nevada, New York, Ohio and Wisconsin. Oklahoma, New Mexico and Arizona are considering moving from ratebase, rate-of-return regulation to price caps.

Most commissions are regulating the monopoly providers through price caps and rate freezes.

• Pennsylvania's Global Settlement

By far the most ambitious state effort at regulatory reform in 1999 was Pennsylvania's "global settlement," though the decision has since been modified. The Pennsylvania Public Utility Commission combined numerous proceedings, including renewal of Bell Atlantic-Pennsylvania's price caps plan, in an attempt at a comprehensive resolution of interrelated

Table 1. Forms of Regulation in the United States (as of March 1999)

ROR	Price Cap	Price Cap w/Interim Rate Freeze*	Rate Freeze	Deregulation
AK	AL (BLS and GTE)	DC (BA)	KS (SBC)	NE
AZ	AR (SBC)	FL (BLS, GTE, Sprint)	MS (BLS)	
CO	CA (PB GTE)	GA (BLS)	OH (CBT)	
HI	CT (SNET)	IL (AIT - basic residential)		
ID	DE (BA)	MD (BA)		
IN	IL (AIT - excluding basic residential)	MA (BA - basic residential)		
IA (USW)	IN (AIT)	MN (Sprint, Others)		
MN	IA (GTE)	MO (SBC)		
MT	KY (BLS)	NJ (BA - basic residential)		
NH	LA (BLS)	NC (BLS, GTE, Sprint - basic residential)		
NM	ME (BA)	OH (AIT - basic residential)		
OK	MA (BA - excluding basic residential)	PA (BA)		
OR	MI (AIT and GTE)	SC (BLS)		
SC	NV (PB and Sprint)	TN (BLS, Others)		
VT	NJ (BA - excluding basic residential)	TX (SBC, GTE)		
VA	NY (BA and Frontier)	VA (BA, Sprint		
WA	NC (BLS, GTE, Sprint - excluding basic residential			
	ND (USW)			
	OH (AIT - excluding basic residential)	*Most interim freezes expire in 2000 and 2001		
	RI (BA)			
	SD (USW)			
	UT (USW)			
	WI (AIT)			
	WY (USW)			

AIT = Ameritech
BA = Bell Atlantic
BLS = BellSouth
CBT = Cincinnati Bell Telephone
PB = Pacific Bell
SNET = Southern New England Telephone
USW = U S West

issues. The most radical and controversial feature of the settlement was a requirement that the company separate its wholesale and retail operations. Structural separation has been advocated as one way to cut the Gordian knot of incumbent LEC resistance to opening their networks to competitors. The Pennsylvania Public Utility Commission required the retail operations of Bell Atlantic to follow the same rules as other companies in accessing the bottleneck facilities of Bell's linchpin network. In its decision, the Commission concluded that structural separations would ensure local telephone competition.[29] The Commission envisioned reducing regulatory oversight of the retail operations but continued regulation of the wholesale platform. Bell Atlantic-Pennsylvania strongly opposed implementation of the wholesale-retail split, took the issue to the state supreme court for review, and the Commission changed its stance.[30]

• Have price caps worked?

Development of incentive regulation has been an evolutionary process. It is difficult to draw definitive conclusions about the performance of incentive regulation in general or price-cap regulation in particular when these regulatory methods are constantly being readjusted. A forthcoming NRRI research report will assess the impact of incentive regulation to date.[31]

Existing academic studies suggest that the prices realized under price-cap regulation are lower than under other methods of regulation. But some observers will argue that residential rates should have dropped even lower than the caps. The FCC report on trends shows the average monthly residential charge for local service was $19.85 in October 1998 compared to $19.24 in 1990; for a small business with a single local line the comparable charges were $41.28 and $41.21.[32] Nationally, there has not been much overall change in rates.

Some aspects of service quality may have been compromised under incentive regulation. Oregon and Washington returned to traditional regulation because of ILEC failures to live up to service quality requirements. Many price cap regimes have required companies to promise deployment of advanced infrastructure. Studies have found that indeed price-cap regulation is also associated with higher rates of modern infrastructure deployment.

A recent study of the effects of price-cap regulation produced provocative results on the impact of price caps on competitive entry, showing a negative relationship. The author's hypothesis is that binding price caps keep prices of local service lower than they otherwise would be, discouraging competitors from entering the market. This is food for thought for state regulators, who must balance the immediate interests of consumers with their longer term interests and with the requirements for a

Commissions in 2000 will be seeking next steps beyond price caps and traditional regulation.

healthy, competitive local telecommunications market.[33] The movement away from traditional rate-of-return regulation towards incentive-based methods of regulation has worked as a regulatory bargain in the United States—a regulatory form that commissions and companies could agree would protect consumers while improving company efficiency as they prepared to face competition. Commissions in 2000 will be seeking next steps beyond price caps and traditional regulation.

• When should further deregulation occur?

A basic rule of thumb in deciding how much economic regulation to impose is that the degree of regulation should be commensurate with the degree of market power. ILECs with considerable market power are pressing now for substantial deregulation through state legislatures. The crucial consideration in deciding how much and how fast to deregulate is the degree of control that the ILEC still exerts over prices, quality, and ability of competitors to enter the market.

Deregulatory bills were proposed in many state legislatures this past year. Some of their provisions may be premature, anticipating development of local telecommunications markets from monopolies to multiple equal players. There appears to be a long way to go before that happens, although a significant technological or business breakthrough could change the picture. Before there are competitive telecommunications markets we are likely to pass through stages where markets may be characterized as dominant firms with a competitive fringe or as oligopolies. In the meantime, states need to rely on new regulatory regimes that include some degree of continued economic regulation with ever greater reliance on consumer protections and antitrust.[34] In Minnesota, the Governor's office issued a plan in January 2000 for telecommunications in the state that proposes to tie the degree of regulation closely to the development of facilities-based competition within service zones.[35] This type of proposal merits serious attention and thought in other states.

• Service quality

The advent of local competition presents new problems for consumer protection and service quality, starting with the bills that provide some of the most important communications between customers and companies. Unfair business practices have already insinuated their way into long distance competition and been a difficult policy question for regulators to deal with in 1999. In 2000, similar headaches may arrive for local competition.

The accuracy and readability of customer bills was a major service quality issue in 1999. With increasing numbers of providers, services, and packages of services the most attentive educated customers can easily have trouble understanding the charges they are being asked to pay. The FCC issued a truth-in-billing order in April.[36] Many states have included truth-in-billing requirements in recent service quality legislation. NARUC's Consumer Affairs

Committee began drafting “Truth-in-Billing Principles” late in 1999. Also in the hopper was proposed legislation introduced by Senator John D. Rockefeller (D WV) that would set requirements for bills for telecommunications services, require the FTC and FCC to jointly conduct an investigation of billing practices of telecommunications carriers, and require follow-up under laws governing unfair business practices and actions against the public interest.[37]

Slamming and cramming continued to be problems affecting telecommunications consumers in 1999. A report by the General Accounting Office reviewed state and federal efforts to reduce unauthorized switching of consumers from one long distance provider to another (slamming) and adding to a customer’s bill services they did not request (cramming).[38] An FCC proposal to establish a federal third-party administrator for resolving slamming disputes generated controversy between states and the FCC. The issue was unresolved by year’s end and is still on the table in 2000. The NRRI has published compendia on both cramming and slamming.[39]

Other service quality questions that will continue to be important in 2000 include symmetry of regulatory treatment and a consumers’ “bill of rights.” Should state service quality standards apply equally to all telecommunications providers (symmetric regulation) or should incumbents be subjected to tougher standards, at least until competition takes hold? An NRRI report suggested that minimum service quality standards should apply to all carriers, with other standards applicable to the responsible carriers.[40] A “bill of rights” for telecommunications customers may be proposed in some jurisdictions, at least as a means of consumer education that alerts people to claims they can still expect to be honored in a competitive telecommunications market.[41]

Although not an area of clear state commission jurisdiction, privacy and security on the Internet are major unresolved consumer protection issues. Access to personal information through monitoring and databases appears to be significantly easier in the growing telecommunications fields. Moreover, privacy in the converging Internet market may be compromised by the presence (and urge to find and keep customers) of numerous service providers. Convergence of various communications devices further complicates the issues surrounding privacy. Historically, security on the Internet is notoriously bad. This tradition in the open systems of the Internet may naturally migrate to other converging platforms. A danger is apparent as security barriers become more critical for the communications system.

The amount of information that may be compromised is a further complicating factor. As data flows become the dominant transaction on the telecommunications system, the amount and type of information that can be secured by breaches in system security become ever more significant. Questions for state commissions to consider include:

- What new security issues are presented by the convergence of communications technologies?
- In what ways does the convergence of communications technologies expand or contract the traditional role of regulatory commissions in the regulation of security issues?
- What are the new roles that convergence presents to regulatory commissions?
- What is the justification for a commission taking a role in assuring privacy and security on the Internet?

Exhaustion of Area Codes

A consumer issue that caused much turmoil in 1999 and will continue to be salient in 2000 is the use of numbering resources that is resulting in many area codes being used up well before it was expected. Assignment of one or more new area codes, either through splits or overlays, has been the principal means of dealing with numbering resource shortages. Recently the focus has turned to ways of conserving numbers. The FCC has plenary authority over numbering issues under the 1996 Act but may delegate authority to the states. In 1999 the FCC allowed several states to take on additional authority to take action on number exhausts. One approach with much promise is thousands-block pooling, where numbers are allocated in smaller batches than heretofore. An FCC order was expected in March 2000 to address many of the alternatives for dealing with number resource use, pursuant to a Notice of Proposed Rulemaking issued in June.[42] The states will be taking an active role in shaping policy on number resources in 2000, an issue that resonates deeply with consumers.

Basic Telephone Service for Everybody

A commitment to universal service is a cornerstone of state and federal telecommunications policy. A variety of mechanisms, some explicit and some implicit, have been used to keep rates low for consumers with low incomes and in areas where telephone service costs relatively more to deliver. Support for high-tech services for schools and libraries and for rural health care facilities were added in the 1996 Act.

As of March 1999, 94 percent of all households in the United States had telephone service.[43] Universal service programs, including Lifeline, have been especially successful at improving subscribership among low-income households.[44] But there are significant differences in penetration rates among groups and among the states. The 1998 FCC report on subscribership levels showed penetration rates of 85.7 percent for households with incomes of $10,000 or less and 87.7 percent for households headed by blacks, for example. State penetration rates ranged from 86.7 percent in New Mexico to 98.4 percent in Minnesota. There are pockets where penetration is even lower, such as Indian reservations.

The 1996 Act requires that the FCC and the states develop universal service support mechanisms that are sufficient, predictable, and competitively neutral. The FCC took a big step forward to meeting that goal when it established a new, forward-looking high-cost support mechanism for nonrural carriers. The new approach calculates costs down to the level of individual wire centers. Using a national cost benchmark, funds will be directed to wire centers with costs furthest above the benchmark, furthering progress towards the targeted, explicit universal service funding envisioned by the Act. The new mechanism contains an interim "hold-harmless" provision, which ensures that the amount of support provided to a nonrural carrier on a per-line basis under the new mechanism will be no less than it receives under the existing high-cost support mechanism. The hold-harmless provision is intended to protect consumers in high-cost areas from potential rate shock during the shift to the new forward-looking mechanism. The FCC requested that the Federal-State Joint Board on Universal Service recommend, on or before July 1, 2000, how long the interim hold-harmless provision should be in effect to avoid causing undue disruption to consumer rates in high-cost areas. The Joint Board began at the end of 1999 to take comments on schedules and procedures for phasing out or eliminating the interim hold-harmless provisions. A number of states stand to lose high-cost support when the hold-harmless provision is removed.

The reconstitution of high-cost support has been controversial, causing tension between high-cost and low-cost states and among industry players. The next big decisions could be at least as tension-fraught. An eighteen-member Rural Task Force appointed by the FCC to make recommendations on universal service issues affecting rural telecommuni-cations carriers is scheduled to report to the federal-state joint board on universal service in 2000, with a proposed mechanism for providing high-cost support to rural carriers. The task force report will include an evaluation of the new cost model's applicability to rural carriers, as well as other more traditional support mechanisms. The Rural Task Force is putting out a series of white papers to help in evaluation of universal service mechanisms.[45] Their final report, expected in September 2000, will include recommendations on how to reconcile universal service support with incentives for competitors and incumbents to invest in high-cost areas and a discussion of appropriate transition policies.[46]

The states will be taking an active role in shaping policy on number resources in 2000, an issue that resonates deeply with consumers.

Progress towards fulfilling the goal of the Act that universal service support be predictable and competitively neutral conflicts with the goal of sufficiency when it meets political resistance to one state subsidizing another. High-cost states feel the pressure as an impetus towards

rate rebalancing. States with their own intrastate universal service funds are having to evaluate their adequacy, while states which do not yet have intrastate funds have been considering instituting them. A 1998 NRRI survey found seven states with functioning universal service funds, seven with funds under revision, and twenty-two in various stages of development.[47]

In the long run, if rates are allowed to more accurately reflect costs in high-cost areas, economically efficient solutions may emerge. If, for example, as some believe, fixed wireless technology offers a cost-effective method to provide service in areas with low population density, more accurate pricing of wireline service would encourage new wireless providers to compete. One unresolved issue is whether wireless carriers can be eligible tele-communications carriers for universal service support. Further complicating this issue as far as the states are concerned is the degree of jurisdiction (if any) of states for wireless services. A 1999 decision by the North Dakota Public Service Commission that Western Wireless was exempt from Commission jurisdiction threw a new wrinkle into this issue. In another ruling, the North Dakota Commission said that Western Wireless is eligible to receive universal service fund support.[48]

• Access charges

The Coalition for Affordable Local and Long distance Services (CALLS) in July filed a proposal for access charge reform with the FCC. The coalition is a formidable and unlikely group that includes both some interexchange carriers and some incumbent local exchange carriers (AT&T, and three of the four remaining baby Bells). The proposal would continue a long-term trend to shift the subsidy of universal service through access charges on long distance carriers to end users. The proposal would combine all existing carrier and subscriber charges into one flat-rated subscriber line charge. It establishes a portable $650 million universal service fund that provides explicit support to replace dollars lost from implicit interstate access charges. NARUC has urged the FCC to consider several issues as it reviews the CALLS proposal: The impact on separations, how end-user consumers will benefit, whether the interests of affordability and comparability are sufficiently accommodated, the impact of the Internet on the continued ability to recover common line costs on a per-minute basis, assessment of both market-based and prescriptive approaches, and consistency with the Telecommunications Act.[49]

If rates are allowed to more accurately reflect costs in high-cost areas, economically efficient solutions may emerge.

The changes suggested by the CALLS group rely in large part on shifting per-minute access

charges paid by interexchange carriers to per-line fees that ILECs would levy on end users. Over five years the plan would cut about $5.6 billion out of access charges paid by interexchange carriers, while increasing local rates in order to replace much of that revenue. Although on paper it appears that ILECs would recover their per-minute access rate cuts through increased per-line charges on local bills, in reality that may not happen, says U S West, the Bell regional holding company that did not join the CALLS coalition. The company has expressed concern that state caps on local rates and other factors may preclude it from recovering the lost access revenues on local bills.

• Jurisdictional Separations

The cost of building and maintaining the public network is allocated through a jurisdictional separations and cost allocation process. Today 25 percent of local loop costs are assigned to the federal jurisdiction. The allocation of the cost of the local loop was set by the Federal-State Joint Board on Separations (the 80-286 Joint Board) and the rules are contained in Part 36 of the FCC's Rules.[50] The separations rules are being reformed under an ongoing FCC proceeding.[51] Changing the allocation of loop costs to the interstate jurisdiction would affect federal universal service support. That in turn could affect the amount of money that needs to be collected from local ratepayers. Some of the issues include the increasing proportion of unregulated services that are delivered over the public switched network and whether part of local loop costs should be allocated to these unregulated services. The state members of the separations joint board released a report on December 21, 1998, that called for reform of separations over a period of time, recognizing that sudden change in jurisdictional allocations can have large impacts on the states—thus on local rates.[52] The state members are concerned about the implications of the many changes in federal regulation that can have an impact on costs to intrastate jurisdictions.

State members of the federal-state joint board filed a request in 1999 for the FCC to solicit comments on a separations simulation cost study analysis tool. The tool is intended to help the joint board evaluate the effects of separations rule changes proposed in response to the commission's separations reform notice of proposed rulemaking. The cost study analysis tool applies the FCC's current Part 36 rules to an ILEC's Automated Reporting Management Information system and allows a user to change variables to study their impacts on interstate and intrastate revenue requirements and cost shifts. The FCC solicited comments on the usefulness of the tool.[53]

• Advanced Telecommunications Services for Everybody?

The Telecommunications Act calls for availability of advanced services to all Americans. The universal service provisions of the Act include this proviso, as does Section 706. The crucial questions, and ones on which policymakers differ, are how quickly advanced

service should diffuse and what measures are appropriate to encourage it. In 1999 several reports were issued with quite different perspectives on the adequacy of advanced services availability and what, if anything, should be done.

Section 706 requires the FCC to generate information on the extent of deployment and whether it is fast enough or whether deregulatory measures should be taken to speed deployment. The FCC's first report concluded that broadband services appear to be coming along well enough.[54] Investment in broadband is high and access to capital is not an obstacle, said the report, observing that broadband for residential customers is in an initial state comparable to other services that eventually reached all Americans. The report remarked that a pessimistic observer would predict that the limits of some broadband technologies would lead to a patchwork of local monopolies, but averred that it would be premature to make this conclusion. The FCC has just recently issued a new report on broadband deployment.

In a second 1999 perspective on the reach of advanced services, the National Telecommunications and Information Administration (NTIA) said 26 percent of U.S. households had Internet access in 1998.[55] But the NTIA noted wide and in some cases increasing discrepancies. The information-rich included Whites, Asians, and Pacific islanders, those with higher incomes, those more educated, and dual-parent households. Regardless of income level, Americans living in rural areas lag in Internet access. The "digital divide" between White and Hispanic households and between White and Black households has widened, as have those based on education and income levels. But the most affluent families, irrespective of race, are connecting to the Net, and the NTIA report suggests that "if prices of computers and the Internet decline further, the divide between the information 'haves' and 'have nots' may continue to narrow."[56]

A third report by consumer advocates early in 1999 pointed to creation of a widening "digital divide" among those who have access to telecommunications services, including advanced services, and those who do not. The authors found not only an increasing gap between telecommunications "haves" and "have-nots," but that the telecommunications and cable industries have become highly concentrated, and that cable prices and in-state long distance rates have increased by 10 percent and local phone rates have risen 3 percent since passage of the Act.[57]

An area where deployment of advanced technologies appears to be going well is for schools and libraries. Through the Universal Service Administrative Company (USAC), "e-rate" funding connects schools and libraries to the Internet. The fund is capped at $2.25 billion a year. USAC reported that total dollars committed nationally as of November 22, 1999, were $1.9 billion for the second year of the program. Funds went primarily to school districts rather than individual schools, libraries, or consortia. USAC reported it was able to fund all 1999 "e-rate requests.[58]

For state commissions in 2000, the policy question will continue to be whether deployment of advanced services is proceeding at acceptable speed and whether other measures, such as distributions from a state universal service fund, need to be considered. The Joint Board on Universal Service will also be facing this issue as possible revisions to the definition of universal service come up in 2000.

G *Joint Conference*

At the urging of NARUC, and particularly NARUC President Bob Rowe, the FCC in 1999 ordered establishment of a joint state-federal conference on issues arising under Section 706, with a goal of speeding deployment of advanced telecommunications services. The goals of the conference are to:

- Monitor and collect data on broadband deployment, assisting the FCC in gathering information for its [Section] 706 report
- Provide a forum for federal, state and local agencies to share ideas on speeding affordable advanced services to rural, low-income, disabled, and other underserved communities
- Serve as a source of information on broadband
- Identify commonalities and synergies among successful federal, state, and local initiatives
- Facilitate coordination of federal and state initiatives, particularly in rural and low-income areas
- Identify "best practices," or programs found to be especially effective in deploying advanced services
- Recognize and encourage private sector efforts to deploy broadband

At year's end, the conferees were selecting sites for regional hearings to identify successful deployment strategies and solicit information on them.

• Regulatory Treatment of the Internet

The courts, the FCC, and the states took steps in 1999 to establish appropriate regulatory policies for the Internet, an effort that often seemed like fitting a multifaceted peg into a very square hole.

G *Cable Open Access*

A U.S. district court upheld the authority of Portland, Oregon to require AT&T to allow Internet service providers not affiliated with AT&T to connect directly to the company's cable modem platform.[59] The judge concluded that the open access requirement is within the authority of the city and county to protect competition. He noted that he did not have to reach a conclusion on whether open access is good policy. A chokehold on ISP access that allows only Excite@home, AT&T's ISP, to reach AT&T customers would be tremendously advantageous to AT&T in justifying its huge investment in cable. But the creation of a new

kind of bottleneck flies in the face of the intent of the 1996 Act to allow customers choice of telecommunications providers, with prices determined by competition. The proposed merger of Time Warner and America Online, announced in January 2000, includes a promise of open access. Battles over open access to cable platforms will continue in many other cities into 2000. And many states may well be considering legislation on the issue.[60] State regulatory authority over cable providers varies.

G *Line Sharing*

In November the FCC directed ILECs to share their telephone lines with providers of high-speed Internet access.[61] ILECs already use line sharing to offer basic telephone service and DSL services over the same line. The FCC said that companies will be able to deploy new technologies faster and cheaper using line sharing, increasing competition.

G *Other Decisions*

Other FCC decisions attempted to push forward on promoting advanced telecommunications services within a regulatory framework that does not accommodate easily. In order to promote the development of the information service industry and advance the goals of the 1996 Telecommunications Act, the FCC found that incumbent LECs may not assess interstate access charges on information services providers. The FCC declined, except in limited circumstances, to unbundle network elements used to provide broadband services.[62]

The idea of separate data subsidiaries for ILECs, broached earlier but on which a decision was deferred by the FCC, reared its head again in late 1999. Bell Atlantic requested that the FCC approve a separate data subsidiary to provide DSL service in New York as part of its approval under Section 271. This was a more limited proposal than the earlier one. The original proposal raised concerns that data services would only be deployed to high-volume customers through the separate subsidiaries.

The FCC went along with the recommendation, requiring the affiliate to be in the same position as any competitors in its access to ILEC facilities. Meanwhile there was strong support in the House of Representatives for a bill that would allow BOCs to provide high-speed data services across LATA boundaries.

Another recurring question is the classification of advanced services, a debate which has implications for interconnection obligations and thus for the potential for access of customers. The FCC is expected to consider the classification question in 2000.

• Conclusion

Telecommunications regulators at the beginning of the century are responsible for fulfillment of basic public policy goals at the same time as their ability to exert authority becomes more circumscribed in key respects. Costs and distance are not closely related in the data revolution. The LATA boundaries set up by the AT&T divestiture are becoming less relevant, as

are state boundaries. Companies providing local telecommunications services over copper wire are branching into other conduit and content. These new entities are dominant in some markets, but not all; are providers of bundled services; are partial or full owners of networks capable of voice and data; and are active in international ventures as well as those within the confines of the United States. They are eager exploiters of demand for bandwidth and often unenthusiastic about the slow-growing basic local telephone business.

Yet these same companies have urgent demands for government. ILECs want to get through the process of admission to in-state interLATA long distance, even as the distinction between long distance and local service becomes less clear. CLECs want assurance that they can get to customers. Both CLECs and ILECs want fair terms of interconnection. Consumers as well still expect a lot from their regulatory commissions. They want low prices for local service, or at least no rate shocks. They want protection from unsavory business practices in the transition to competition, as well as the high quality they have grown to count on. And they want access to the Internet.

Commissions are faced with the Herculean task of crafting policy to oversee multiple, intertwined, multiproduct firms where some products are dominant in some markets that themselves overlap or are difficult to define geographically. They must continue to keep a lid on monopoly pricing where monopoly power can still be exerted. They must adjust to the squeeze being put on universal service mechanisms, looking ahead to long-run efficiencies as well as short-run displacements. They must avidly promote competition, with appropriate monitoring and assessment of markets as they develop. They must protect and educate consumers. And they must adapt to and promote the Internet and all it portends.

We have speculated about many of the specific policy questions facing commissions in 2000. One of the most interesting is likely to be whether commissions will have to break up the public switched network to make it whole. In other words, will Pennsylvania's idea of separating the network into a platform and services attached to the platform catch on as a way to make sure consumers are still served by a fully interconnected, interoperable network and all providers have full, fair access? Other big questions:

- Is it time to consider advanced services part of basic universal service?
- How can regulators assure, targeted, sufficient universal service in a multiplayer environment?
- How can they minimize confusion and maximize choice for consumers?
- Is competition happening quickly enough? If not, would scrapping the entry provisions of the Telecommunications Act for data help competition to develop faster without making the digital divide more gaping?

- How do regulators apply appropriate tests of market power and consumer service in deciding when further deregulation of eroding monopolies should occur?

These are all questions commissions face right now, plus perhaps the largest issue: How can policymakers both delimit regulation and limit market power in a world with fuzzy boundaries?

Endnotes

[1] Telecommunications Act of 1996, amending the Communications Act of 1934 (47 U.S.C. 151 et seq).

[2] Peter Wayner, "Plugging into the Internet: Many Paths, Many Speeds," *New York Times*, July 2, 1998, G-11.

[3] "Where's Broadband?," *Maximum PC* (October 1999) at 26-27.

[4] Killen & Associates, cited in "Net Phones Boom, Unregulated," News.com (December 4, 1997), at http://www.news.com.

[5] Council of Economic Advisers, *Progress Report: Growth and Competition in U.S. Telecommunications, 1993-1998*, February 8, 1999.

[6] Phillips Business Information, *1999 Telephone Industry Directory*, Potomac, MD, 1999.

[7] FCC, *Trends*, 11-7, Table 11-3.

[8] *Washington Post*, April 5, 1999.

[9] Ramsay report, June 18, 1999, *USA Today*.

[10] National Cable Television Association, http://ncta.cyberserv.com/qs/user_pages/Cable Industry at a Glance.

[11] Seth Schiesel, "AT&T's High-Stakes Gamble on Interactive Cable Television," *The New York Times*, January 3, 2000.

[12] This list is drawn from Richard Adler's predictions about the network. Richard Adler, *Projecting the Telecommunications Industry in 2009*, http://www.naruc.org/chapter4.htm (site visited September 10, 1999). For another treatment of the themes in the information economy, see Don Tapscott, *The Digital Economy: Promise and Peril in the Age of Networked Intelligence* 43-72 (1996).

[13] CECA/RF, *Convergence Forum*, Draft Report (June 24, 1999) 28.

[14] Ibid., 29.

[15] Five last-mile technologies are likely to compete for customer acceptance: cable, DSL, satellite, local multipoint distribution service, and optical fiber. See, generally, "Special Report: High-Speed Data Races Home," *Scientific American* (October 1999), 94.

[16] Nortel announced in late 1999 a design that permits 6.4 terabits per second transmission rates on a single optical fiber. Joe McGarvey, "Nortel Breaks Bandwidth Boundary," *Inter@ctive Week* (October 18, 1999) at 18.

[17] Adler, *Projecting the Telecommunications Industry*.

[18] Moore's law, formulated by Gordon Moore, a co-founder of Intel, states that computing power doubles every year to eighteen months.

[19] Adler, *Projecting the Telecommunications Industry*.

[20] Ibid.

[21] Ibid.

[22] Jim Albrycht, "The Digital Home Furnace," *Telephony* (June 8, 1998) at 222-23.

[23] S 652, passed by the Senate in 1995 and the basis for the Telecommunications Act of 1996.

[24] FCC Industry Analysis Division, *Trends in Telephone Service*, September 1999. Available at the FCC-State Link web site at http://www.fcc.gov/ccb/stats.

[25] FCC Industry Analysis Division, *Local Competition*, December 1998. Available at http://www.fcc.gov.ccb/stats.

[26] *State Telephone Regulation Report*, 17:26, December 24, 1999, 1.

[27] *AT&T Corp. v. Iowa Utilities Board*, 119 S. Ct. 721 (1999).

[28] Frank Darr, "Prepaid Telephone Service Companies: New Players and the Regulatory Mission," *NRRI Quarterly Bulletin* 20:2, Summer 1999, 129-139.

[29] David W. Rolka, "Next Generation Models for Network Industries and Regulatory Practice," presentation at the 31st annual conference, Institute of Public Utilities, December 9, 1999.

[30] "Pennsylvania PUC Can't Okay New Settlement*, AT&T Says," Telecommunications Reports*, January 19, 2000.

[31] Jaison Abel, *The Performance of the U.S. Telecommunications Industry Under Price-Cap Regulation: An Assessment of the Empirical Evidence*. Columbus, Ohio: NRRI, forthcoming.

[32] FCC, *Trends*, 14-3 and 14-4, Tables 14.1 and 14.2.

[33] Jaison Abel, *Pricing and Competition in Local Telephone Markets Under Price-Cap Regulation*. The Ohio State University, 1999. Doctoral dissertation.

[34] Edwin Rosenberg and Michael Clements, *Evolving Market Structure, Conduct, and Policy in Local Telecommunications* (Columbus, OH: The National Regulatory Research Institute, February 2000).

[35] Minnesota Planning, Department of Commerce, Department of Administration, Department of Trade and Economic Development, *Ventura Administration Telecommunications Strategic Plan*, December 14, 1999. Available at http://www.admin.state.mn.us/govplan.htm.

[36] FCC, CC 98-170, early April.

[37] S 1825, first session, 106th Congress (October 28, 1999).

[38] U. S. General Accounting Office, *Telecommuni-cations: State and Federal Actions to Curb Slamming and Cramming*, July 1999. Available at http://frwebgate.access.gpo/cgi-bin/multidb.cgi.

[39] Fran Sevel, *An Analysis of Cramming: Stakeholder Actions, Policy Recommendations, and Related Resources* (Columbus, OH: National Regulatory Research Institute, 1999).

[40] Michael Clements, *Quality-of-Service and Market Implications of Asymmetric Standards in Telecommunications* (Columbus, OH: National Regulatory Research Institute, 1998).

[41] Vivian Witkind Davis, *A Critical Perspective on a Telecommunications Bill of Rights* (Columbus, OH: National Regulatory Research Institute, 1999).

[42] FCC, "Notice of Proposed Rulemaking," *In the Matter of Numbering Resource Optimization*, CC Docket 99-2000, FCC 99-122, June 2, 1999.

[43] See Alexander Belinfante, *Telephone Subscribership in the United States (Data Through November 1998)*, Federal Communications Commission, Common Carrier Bureau, Industry Analysis Division, February 1999.

[44] See Alexander Belinfante, *Telephone Penetration by Income by State (Data Through 1998)*, Federal Communications Commission, Common Carrier Bureau, Industry Analysis Division, February 1999.

[45] The Rural Task Force web site is http://www.wutc.wa.gov/rtf.

[46] Commissioner Bill Gillis, Washington Utilities and Transportation Commission, Rural Task Force Chair, Comments to the FCC, October 21, 1999.

[47] Edwin A. Rosenberg and John D. Wilhelm, *State Universal Service Funding and Policy: An Overview and Survey* (Columbus, OH: National Regulatory Research Institute, 1998).

[48] *Telecommunications Reports*, December 20, 1999.

[49] NARUC, Initial Comments, in the matter of access charge reform (cc docket 96-362).

[50] 47 CFR 36.

[51] FCC, *Notice of Proposed Rulemaking in Jurisdictional Separations Reform*, CC docket 80-286, October 7, 1997 (FCC 97-354).

[52] *Telecommunications Reports*, January 4, 1999.

[53] FCC, "Request for the FCC to Notice and Solicit Comment on their Separations Simulations Cost Study Tool," Establishment of pleading cycle, CC Docket 80-286, December 1, 1999.

[54] FCC, Report, *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996.* CC Docket 98-146, January 28, 1999.

[55] National Telecommunications and Information Administration, *Falling Through the Net: A Report on the Telecommunications and Information Technology Gap in America* (1999).

[56] Ibid., Executive Summary.

[57] Mark Cooper and Gene Kimmelman, *The Digital Divide Confronts the Telecommunications Act of 1996*, February 1999.

[58] "USAC Says It Can Fund All 1999 'E-Rate' Requests," *Telecommunications Reports*, November 1, 1999.

[59] U.S. District Court or the District of Oregon, Opinion, AT&T Corp., Tele-Communications, Inc.; TCI Cablevision of Oregon, Inc.; and TCI of Southern Washington v. City of Portland and Multnomah County, CV 99-65-PA, June 3, 1999.

[60] "'Coherent' FCC Action Called 'Missing Piece' on Open Access," *Telecommunications Reports*, December 20, 1999.

[61] FCC 99- 355, *Third Report and Order* in CC Docket 98-147 (released November 18, 1999).

[62] FCC "Access Charge Reform," First Report and Order, FCC97-158, cc Docket 96-262, May 7, 1997.

A Forward Look at the U.S. Drinking Water Industry: Four Visions of the Future

JOHN D. WILHELM *joined the NRRI in August 1999 as a Senior Research Associate and is currently in charge of the Institute's water research program. He has recently completed a report on capacity planning and development for drinking water systems and is working on customizing a decision support methodology for state utility commissions. He is a member of the NARUC Staff Subcommittee on Water.*

John received his undergraduate degree from the United States Military Academy in Nuclear Engineering and his Masters degree in Industrial Engineering from the University of Tennessee, Knoxville. He is currently a Ph.D. candidate in the School of Public Policy and Management at The Ohio State University.

• Introduction

Today's regulatory landscape is characterized by major new themes: competition, deregulation, restructuring, markets, new technology, convergence, and transformation. At the close of a century of stable, predictable commission regulation, change has become the order of the day in the telecommunications and energy sectors. Amidst this changing regulatory climate, the privately owned drinking water industry is often seen as the last bastion for traditional economic regulation, and insulated from the forces that are forever changing the nature of products, services, and regulation in the other utility sectors. As we look to the future of the regulated drinking water industry, it is important to challenge this perception and stretch ourselves to explore our visions of how this future might unfold.

The future is, of course, unknown. Speculating about the future is often as much art as it is science. When it comes to safe drinking water,

a fundamental public service and necessity for life, it is important to inform this speculation as much as possible. In order to facilitate the exploration of the future of the drinking water industry, we have chosen to combine the forward-looking approach known as "scenario planning"[1] with information collected from drinking water professionals in state public utility commissions. Planners and policymakers have effectively used the "scenaric" approach to identify and organize their thoughts about the potential futures they might encounter. The information provided by state commissions will help to triangulate on likely future scenarios and orient the discussion towards areas of interest to the regulatory community. The goal of this discussion is to provide utility regulators with an informed framework that is a useful complement to the strategic planning activities they will undertake as we close out a century of stable regulatory practice and forge into the beginning of the new millennium and the next twenty-five years of the Safe Drinking Water Act.[2]

• The Scenaric Approach

Scenario planning is a powerful approach to strategic, forward-looking planning, and policy formulation. As the most certain aspect of the future is its uncertainty, the "scenaric" method offers an approach that facilitates framing, discussing, and developing alternate views of what might lie ahead. It has been successfully used to assist policymakers explore important decisions and to craft strategies to address uncertain futures. Notable organizations that have introduced the scenario-building process into their forecasting practices include the Royal Dutch/Shell Group, Pacific Gas and Electric, Motorola, and the United States Air Force.[3] The National Regulatory Research Institute (NRRI) has also facilitated scenario-planning exercises for the Georgia Public Service Commission and for the Executive Directors Staff Subcommittee of the National Association of Regulatory Utility Commissioners (NARUC).

Complex forces and ill-defined relationships between the potential factors and events contemplated in uncertain futures pose a common challenge for strategic planners. The scenario building approach helps to frame the topic by forcing the identification of the *driving forces* and *critical uncertainties* present in the system. Driving forces are "the forces that influence the outcome of events."[4] An inseparable component of the driving forces are the uncertainties surrounding them. "In every plan, critical uncertainties exist. Scenario planners seek them out to prepare for them."[5]

The goal of this discussion is to provide utility regulators with an informed framework that is a useful complement to the strategic planning activities.

Peter Schwartz describes the process as follows:

> The scenario process provides a context for thinking clearly about the impossibly complex array of factors that affect any decision. It gives managers a common language for talking about these factors, starting with a series of "what-if" stories, each with a different name. Then it encourages participants to think about each of them as if it had already come to pass. Thinking through these stories, and talking in depth about their implications, brings each person's unspoken assumptions about the future to the surface. Scenarios are thus the most powerful vehicles I know for challenging our "mental models" about the world, and lifting the "blinders" that limit our creativity and resourceful-ness.[6]

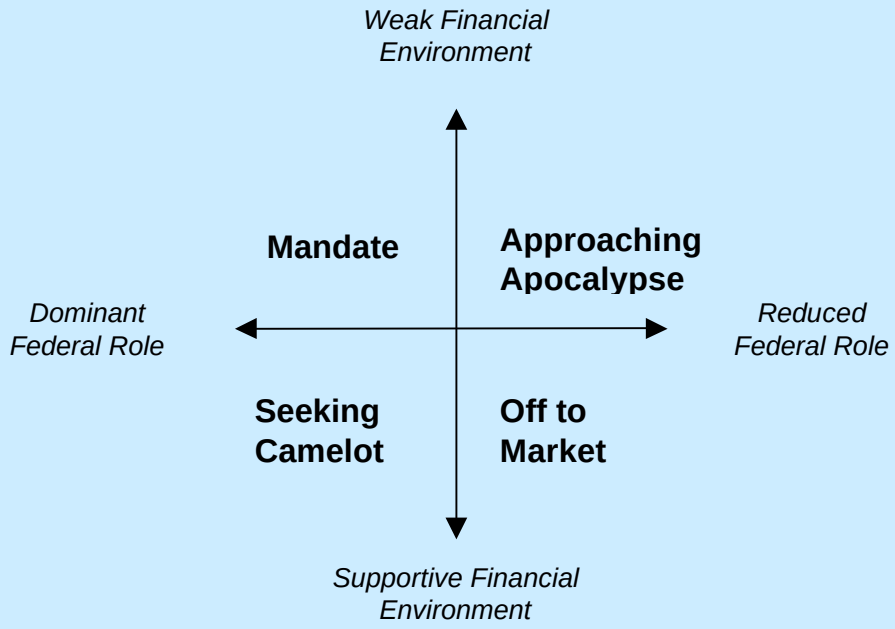
Schwartz points out that the scenarios developed through this process are not predictions. The process, however, is designed to offer more than mere extrapolations of current trends. It offers a means of envisioning alternative futures and "making choices *today* with an understanding of how they might turn out."[7]

• Drinking Water Scenarios

The scenario planning efforts conducted in 1996 by the Rocky Mountain Institute simplify our work here. The Institute's report *Water 2010: Scenarios for 21st Century Water Systems*[8] identifies numerous challenges and uncertainties affecting the industry. These included government regulation, infrastructure costs, public confidence, water demands, and new treatment technologies. From these factors the report identified two key driving forces. The first of these is the federal government's involvement in water management. The critical uncertainty for this driver hinges on whether the federal government takes a "dominant" role or a "reduced" one. The second key driver identified by the report concerns the financial environment facing the water industry. In this case "weak" or "supportive" financial environments provide the critical dimensions for the scenarios.
Combining the critical dimensions of the issue produces a four-scenario matrix for the drinking water industry.

A graphical representation of the four scenarios in the model is shown in Figure 1. The horizontal logic axis represents the federal role (dominant] reduced). The vertical logic axis depicts the financial environment confronting the industry (weak] supportive). Also note the names attributed to each of the four quadrants by the planners. This technique is purposeful and designed to "capture the general nature of each scenario in an evocative, memorable label."[9] For example, a weak governmental presence combined with a supportive financial environment will most likely lead to a future state characterized by increased market activities and competition, thus "off to market."

Figure 1. Four Potential Scenarios



Source: Pinkham and Chaplin, *Water 2010, Four Scenarios for 21st Century Water Systems*, 5.

The next step in the scenario process involves "fleshing out the skeletal scenarios." The summary narratives constructed for each of the potential futures by the team from the Rocky Mountain Institute are as follows.

MANDATE:

- Dominant Federal Role
- Weak Financial Environment

Federal agencies maintain high standards for water quality and environmental protection. But enforcement activities are under-funded, and coordination with state and local governments is difficult. Budgets at all levels of government are severely pinched. Citizens demand high standards out of concern for public health and the environment, but they are so overburdened by taxes and the high cost of living that they resist rate increases necessary to support water system improvements.[10]

APPROACHING APOCALYPSE

- Reduced Federal Role
- Weak Financial Role

Times are tight…and activist federal agencies are history. Federal financial assistance for water and wastewater infrastructure is unavailable. Many

powers—including standard-setting and enforcement authority for drinking water quality and wastewater discharges—have devolved to the states. But most state and local budgets are also strapped. Despite public concern over the safety of drinking water supplies, the majority of ratepayers resist the higher bills necessary to finance needed infrastructure improvements.[11]

SEEKING CAMELOT

- Dominant Federal Role
- Supportive Financial Environment

The public…demands a very strong federal role in addressing water quality and water quantity concerns. The EPA and other federal agencies set high standards, enforce them strictly, and are intimately involved in water quantity management across the country. A strong economy, ratepayer support, and some federal government grants, loans, and loan guarantees ease financing of water system capacity expansions, major maintenance, and treatment system improvements.[12]

OFF TO MARKET

- Reduced Federal Role
- Supportive Financial Environment

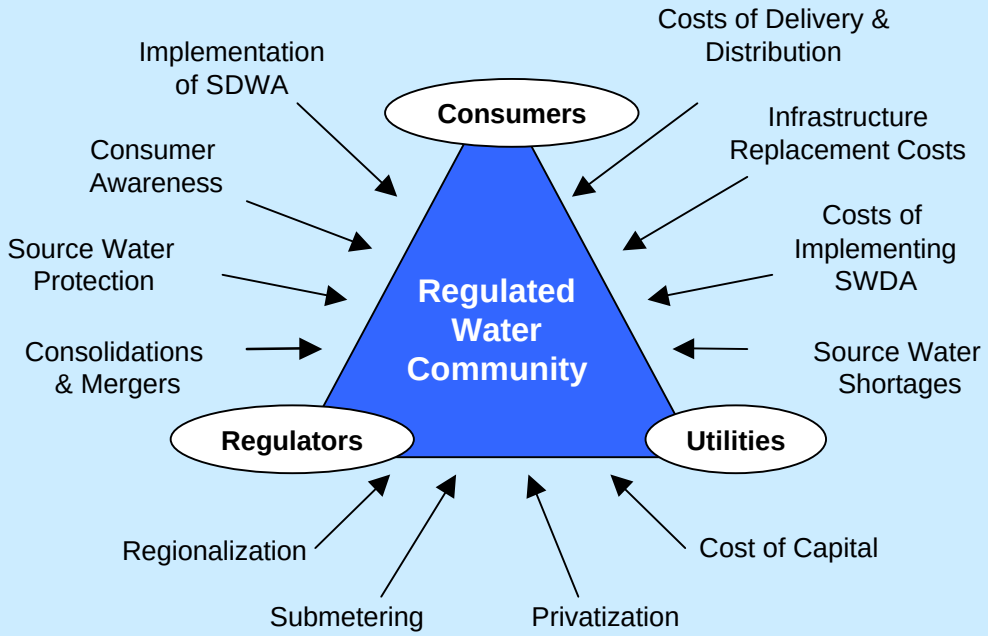
The federal government's role in regulating water is minimal. So too is federal funding for water infrastructure. Federal water programs are largely oriented toward partnerships with lower levels of government and the private sector. Consolidation, privatization, and support from investors and affluent ratepayers enable some water utilities to finance needed infrastructure improvements, but others find the market-oriented times difficult.[13]

Triangulation on the Future

The development of the four possible scenarios along the decision axes shown in Figure 1, combined with the summary sketches of potential futures, provides us with a platform from which we can perform a little prognostication. The four potential futures help to frame the likely options from a myriad of choices. The accompanying narratives help focus and project us into these future states. NRRI wanted to go a step beyond the standard practice of developing likely scenarios and attempt to hone in or "triangulate" on the most likely one.[14] We also felt that the inclusion of our additional information gave us the unique opportunity to validate or provide supporting evidence for the scenario model used to frame this exercise.

We were able to provide additional insights into the Rocky Mountain Institute's four-scenario model by incorporating information we gathered in an NRRI survey specifically designed for this purpose. This additional information was generated through our independent survey of drinking water and utility specialists in state public service commissions. The instrument was open-ended and designed to elicit perspectives from these experts regarding the significant trends and driving forces they think will shape the water industry in the coming years. Figure 2 depicts the breadth of

Figure 2. Factors Affecting the Regulated Water Community



Source: Author's construct from NRRI survey data.

responses we received. Of all the trends identified, two responses were given with the most frequency. The two most commonly identified drivers were the implementation and costs issues associated with the Safe Drinking Water Act (SDWA), and the heady pace of financial activity characterized by the numerous consolidations, acquisitions, and mergers (CAM) occurring and expected to occur in the industry.

The NRRI survey also asked the respondents to identify *the* most important of these trends. Again, there was a clear separation between the number of responses indicating SDWA and CAM versus any alternatives. Interestingly, the number of responses for these two forces was virtually identical.[15] There was, therefore, no consensus on a singularly important driving force. Two candidates emerged.

Not only did the survey responses give us valuable input from the perspective of industry experts, it afforded us the opportunity to validate the scenario model proposed by the Rocky Mountain Institute. We felt that if the indications from our data differed, in terms of the number and types of significant drivers, from that proposed in the model, this might suggest that the regulatory professionals participating in our survey framed the future differently than those who participated in the scenario process. In this case, interestingly, NRRI's survey findings and

the Rocky Mountain Institute's scenario construct are functionally equivalent. The same two driving forces arose from both sources; the role of the federal government/SDWA and the financial environment/CAM. We are, therefore, encouraged by the fact that the NRRI survey data and the Rocky Mountain Institute's scenario model are mutually supporting.

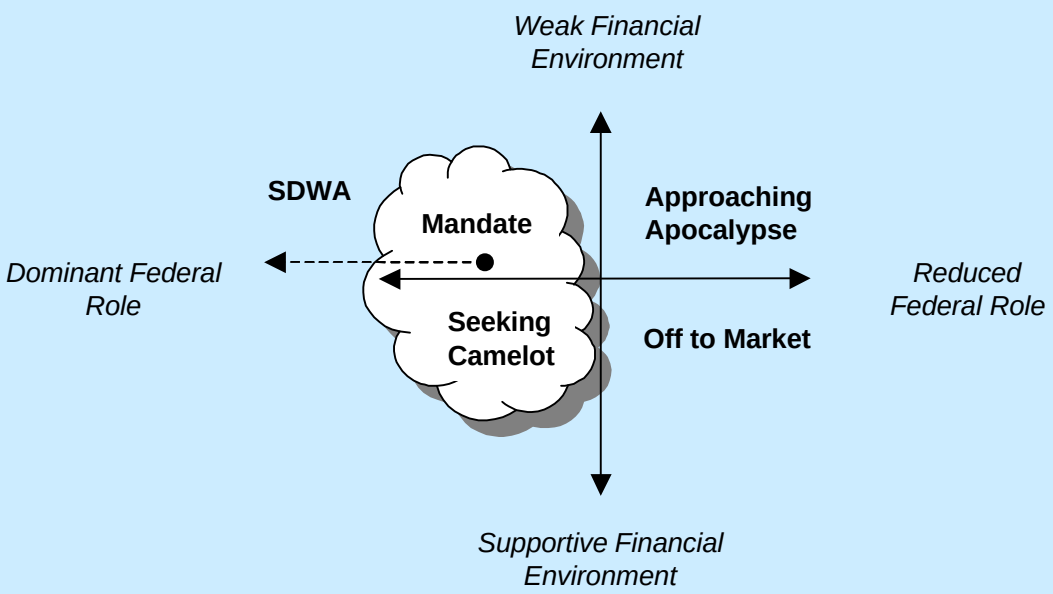
The next step in our progression towards a vision of the future was to overlay the information generated by the NRRI survey onto the future landscapes suggested by the scenarios in Figure 1. Without a doubt, the picture painted by our survey responses portrayed a future in which the federal government continues to increase its presence in the drinking water industry. Furthermore, the primary instrument of this expanding role was expected to be an ever-stronger Safe Drinking Water Act.

External evidence supporting the continuingly strong role of the federal government in drinking water issues was recently articulated by Carol Browner,[16] Administrator of the EPA, and several other industry experts who spoke at the 25th Anniversary Celebration of the Safe Drinking Water Act.[17] Additionally, in a joint statement prepared for this event, nineteen "drinking water partners" (including NARUC) called for future EPA actions that "expand existing efforts" and focus on scientific research, compliance by water systems, infrastructure issues, and voluntary programs beyond those mandated by regulation.[18] Furthermore, the EPA recently published performance-based drinking water goals for 2005 that call for national improvements in source water protection, treatment standards and compliance, and consumer information. All of this works toward its "overall goal" that "by 2005, protect human health so that 95 percent of population served by community water systems will receive water that meets health-based drinking water standards…"[19] Taken together, the preponderance of information recently provided by the EPA combined with the input supplied by the NRRI survey respondents, it is easy to forecast an expected future in which the role of the federal government is characterized as a *dominant* one. The improved perspective concerning one of our two critical uncertainties (government role) allows us to reduce the original set of future scenarios from four down to two: "Mandate" or "Seeking Camelot." This new orientation is depicted graphically in Figure 3.

Survey responses portrayed a future in which the federal government continues to increase its presence in the drinking water industry.

What does this mean? First it means that, based on our information, we simply expect that the two strong SDWA scenarios (Mandate & Seeking Camelot) are more likely than the two scenarios predicated on a weak government role (Approaching Apocalypse & Off To Market).

Figure 3. Strong Federal Role Through SDWA



Source: Author's adaptation of Figure 1.

This does not mean that the weak SDWA scenarios will not occur or that the strong SDWA scenarios will occur with certainty. In fact, the industry's experience may well be a mixed one based on such factors as size, location, state/local role, and so on.

Having dealt with one of our two critical uncertainties we are now free to explore the other—the financial environment facing the industry. If one believes the financial environment facing the water industry will be a difficult one, then we might expect to see a future similar to the mandate-laden days of the early nineties. On the other hand, if one feels that the financial climate is going to be more attractive, we might be on the verge of a golden age (Camelot) in the water industry.

We used our commission surveys to shed more light on this remaining uncertainty (financial environment). As previously mentioned, the second significant theme highlighted by the respondents was the considerable momentum building in consolidation, merger, and acquisition activity. The most frequently cited driver for this was a financial and regulatory climate that was conducive to this sort of behavior on the part of the utilities. Additional external support for this trend is provided by the 1999 Farkas Berkowitz "State-of-the-Industry Report."[20] This annual report on key infrastructure markets finds that financial activity in the United States water industry is a dominant trend, buttressed by a strong international market and increased activities in consolidation, privatization, and outsourcing.

The industry outlook given in the report states that:

> Further consolidation in the water quality systems sector is inevitable. It will occur at an accelerating pace, and it will occur on a global scale. Yet, by today's standards, even billion dollar companies, at least those that are publically traded, are coming to be viewed as small.
>
> Overall, the U.S. water quality systems market is the largest in the world. Moreover, the continuing trend toward privatization and outsourcing presents attractive growth prospects. Any firm that wants to be a major player in the industry must establish a visible presence in the U.S. [Firms] can only achieve their objectives by acquisition, and recent experience suggests that they are willing to make offers that targeted candidates find difficult to refuse.[21]

Armed with informed conjecture on the second critical uncertainty (financial environment), we can refocus our attention on the choices that are left and pare the remaining set of future scenarios from two down to one: "Seeking Camelot." This is depicted graphically in Figure 4. The combination of a strong federal role (SDWA) and an active financial environment (CAM) points us to this location on our landscape of futures. Again, we do not propose a one-size-fits-all experience for the 50,000 community water systems in the United States. Our information simply leads to a generalized industry experience that leans toward this scenario.

• Camelot (revisited)

Taken together, the NRRI data and the scenario planning work of the Rocky Mountain Institute orient us towards a future characterized by strong drinking water legislation and a supportive financial climate. Two important questions arise at this juncture. The first is "What are the defining characteristics of this future scenario?" The second question is "What are the best regulatory responses for this future?" Of course we don't know the answers to either of these questions definitively. This does not preclude us, however, from offering some generalizations regarding each.

Some of the potential characteristics suggested by the "Camelot" future are as follows:[22]

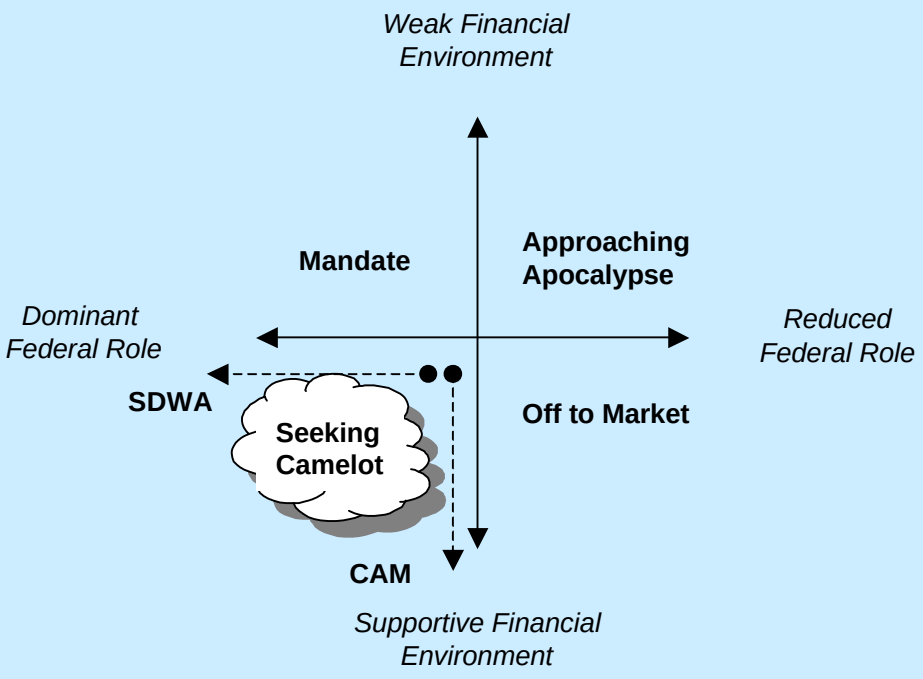
< Increased public interest for all water-related environmental programs, especially among the members of an aging society (including baby boomers) and "vulnerable" or "at-risk"populations.

< Drinking water quality standards continually strengthened with public support.

< Continued strong federal role in water quantity management (dams, water rights, wetlands, source water issues, and so on).

< Convergence between the Safe Drinking Water Act and the Clean Water Act, as well as with other federal legislation that begins to address water and the environment in a holistic sense.

Figure 4. Strong Federal Role (SDWA) & Supportive Financial Environment (CAM)



Source: Author's adaptation of Figures 1 and 2.

< A watershed and river-basin approach, facilitated by improved information systems, leads increasingly towards resource management based on hydrologic boundaries, not political ones.

< A strong economy leads to increased financial support for drinking water programs (loans, grants), including enhanced assistance for small systems.

< Improved treatment technologies are developed and brought into production due to the public's increased interest in drinking water quality combined with an increased willingness to pay for it.

< Replacement of nation's aging infrastructure is generally facilitated by financial programs and ratepayer support.

< There is a general restructuring of the drinking water industry in terms of the

number (fewer) and size (larger) of private utilities.

< The restructured industry is financially “healthier” than its predecessor primarily due to economies of scale found in financial, managerial, and technical areas of the business.

< The percent of foreign ownership of United States utilities increases considerably. Competition is fierce in the initial stages but dwindles over time as the number of players becomes fewer and the number of attractive acquisitions/ mergers becomes smaller as well.

< Some ratepayers, especially those in the remaining small systems, become increasingly unhappy due to a combination of rateshock and troubles with meeting ever increasing standards. They have not received the improvements experienced by customers at large.

< The myth that “water is cheap” is finally dispelled.

Potential regulatory responses and strategies available within the future we have painted are many and we expect they will vary from state to state. As usual, appropriate responses depend on the goals that the commission has relative to the environment it faces. As the future may be dominated by a strong federal presence, it is reasonable to pursue strategies and policies that acknowledge this condition. Even though it is unlikely that state public utility commissions will forge direct, individual partnerships with the EPA, recent experience has witnessed an increase in the dialog on policy issues between the EPA, NARUC, and state public utility commissions.

A complete focus on the federal level, however, may be an inefficient perspective for commissions. A more effective approach will most likely take the strong federal presence as given, and then attempt to anticipate the effects of federal policy on state primacy agencies, regional water authorities, local utilities, and customers. This smaller scale is where implementation takes over and actual results are experienced by firms and consumers alike.

Effectively translating policies between various governmental levels, while seeking the proper balance between firms and users, will be a challenge for commissions. This is a challenge, however, for which commissions are uniquely prepared and used to dealing with. In fact, commissions have a rich history to draw from in the telecommunications and energy sectors when looking to this new role in water. For years commissions have worked with the FCC and FERC on one hand, and consumers, firms, and state governments and agencies on the other. The evolutionary changes in regulating water may task commissions to don a familiar mantle, simply in a new sector.

In the Camelot scenario it is also likely that the amount of collaboration between state agencies

and regional authorities will increase. The federal push towards managing water as a unified resource will force similar behavior at other levels. The most striking example of this to date is in Texas where water is regulated (environmentally and economically) by a single state agency, the Texas Natural Resources Conservation Commission (TNRCC). Several state commissions have recently suggested to NRRI that they would benefit from research into the increasing need to collaborate with intrastate agencies, the state legislature, and governor's office on water resources and water policy. The harbingers announcing collaboration, communication, and a more holistic approach to managing water as a state-level resource have sounded.

The financial information and indications we reviewed raised certain considerations for commissions as well. In general, consolidations, acquisitions, and mergers that reduce the number of small water utilities would be a boon for commissions (and consumers). "Healthier" utilities are presumably better for all. The challenge, however, may be one of crafting policies that promote and reward "good" forms of industry restructuring while preventing unwanted effects. Privatization proponents are fond of evoking images of competition and market forces which lessen or eliminate the need for regulation.

Privatization in the water industry, however, takes many forms. Arguably, the most popular forms of privatization do not involve asset transfers that create regulated utilities, they seek to establish contract operations expressly designed to avoid regulation. What may arise is a segment of the industry populated with quasi-private utilities (conversely, pseudo-public as well) that operate "between the cracks" of commission regulation and local authority.

The Farkas Berkowitz report indicates that there will be an inevitable consolidation in the water industry and that the strong will get stronger. Even in a supportive financial climate, then, it is likely that small, unprofitable, and poorly run water utilities will continue to be a problem. This means that water quality and water quantity will continue to be a problem for their customers as well. Again, looking to federal and state interagency solutions may be a better fit for solving this issue than simply addressing it from the perspective of commission-based economic regulation. One of the important tools that regulators bring to the table on this issue is their knowledge and experience in designing and implementing programs akin to universal service in the telecommunications sector. Programs that advance safe and clean drinking water for all will be desirable and well received. The time will come when achieving this societal goal will be every bit as important as it was in

> This increased awareness will lead to greater demands for information and an increased opportunity for the public to connect water quality and price decisions.

telephony. Commissions are well poised to make a strong contribution in this area.

Another logical extension along the lines of social well-being includes consideration for "vulnerable subpopulations." While the obvious issue here is water quality, the ground between economic efficiency and equity will need to be addressed. Again, commissions are well suited to this type of policymaking and have a history of wrestling with the tradeoffs.

A final observation about our projected future concerns the increasing role in information provision and in the consumer affairs function performed by commissions. The most recent version of the SDWA contains strong guidelines regarding consumer information. The EPA Futures Forum work identified public outreach and education as a cross-cutting theme that emerged as a cornerstone of effective drinking water protection. The federal hand that has already given us the Consumer Confidence Reports appears poised to increase this type of requirement in the future. There is also a growing public awareness surrounding drinking water quality. This increased awareness will lead to greater demands for information and an increased opportunity for the public to connect water quality and price decisions. It is reasonable to assume, therefore, that the general trend for increased consumer information and advocacy being experienced by commissions will have a growing water component as well.

A general summary of the issues suggested by our work is depicted in Figure 5. The future we found is far from the gloomiest one available. This future is characterized by strong federal involvement, supportive financial markets, a generally "healthy" industry, increased public awareness, and a continued, if not enhanced, role for public service commissions.

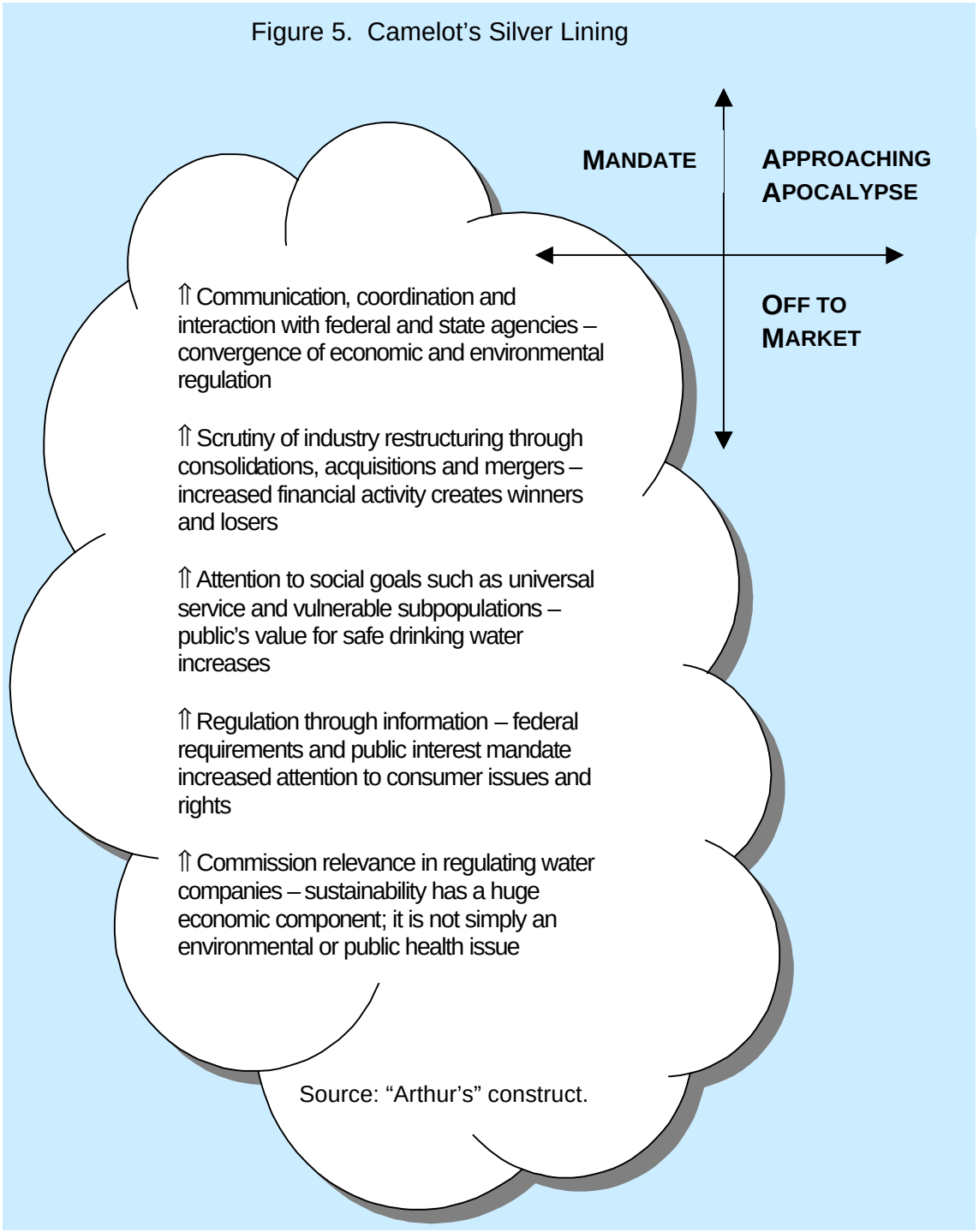
It challenges each organization to craft its own framework for viewing the future, to select its own indicators of significance and to examine its own set of assumptions, beliefs, and goals.

Summary

Experienced planners use the best information they have. Being correct is not as important as being prepared. Envisioning multiple futures and accounting for them is part of being prepared. We have suggested four such futures and focused on one. We used NRRI's commission survey data to triangulate towards a future vision that is characterized by its supportive financial climate and the strong role of the federal government in the drinking water field. The question remain—"Is this truly where we are headed over the next ten to twenty years?" Only time will tell. There are certainly other alternatives that have been illuminated in the course of this exercise.

We hope that planners in commissions will consider the scenaric approach that we have posed here and engage in the exercise for themselves. We expect that there will be disagreement with some, if not many, of our assumptions and the manner in which we processed the information at our disposal. This is productive because it challenges each organization to craft its own framework for viewing the future, to select its own indicators of significance and to examine its own set of assumptions, beliefs, and goals—all the while attending to a customized perspective on their own future vision.

Figure 5. Camelot's Silver Lining



Source: "Arthur's" construct.

Endnotes

[1] Peter Schwartz, *The Art of the Long View: Planning for the Future in an Uncertain World* (New York, NY: Doubleday, 1996).

[2] The original Safe Drinking Water Act was passed in 1974. At the time of this writing it is 25 years old. The Act has been amended twice, in 1986 and, most recently, in 1996. An interesting overview of the Safe Drinking Water Act can be found in: U.S. Environmental Protection Agency, Office of Water, *25 Years of the Safe Drinking Water Act: History and Trends*, EPA 816-R-99-007, 1999.

[3] Schwartz, *The Art of the Long View: Planning for the Future in an Uncertain World*, xv.

[4] Ibid., 101.

[5] Ibid., 115.

[6] Ibid., xv.

[7] Ibid., 4.

[8] Richard Pinkham and Scott Chaplin, *Water 2010, Four Scenarios for 21st Century Water Systems* (Snowmass, CO: The Rocky Mountain Institute, [1996]).

[9] Ibid., 4.

[10] Ibid., 1996, 6.

[11] Ibid., 1996, 8.

[12] Ibid., 1996, 10

[13] Ibid., 1996, 12

[14] Of course, our efforts are at best predictive, and we really won't know the future until it unfolds before us.

[15] The most frequently noted "significant trend" in the survey responses fell under the category for consolidations, mergers, and acquisitions. Although more numerous, we do not place any statistical significance on the difference between the number of responses indicating CAM and those for SDWA.

[16] The remarks prepared for Carol M. Browner, Administrator Environmental Protection Agency 25th Anniversary of Safe Drinking Water Act in Washington, D.C. on December 16, 1999 can be found on EPA's website (www. epa.gov/epahome/ news.htm) under "Speeches".

[17] The event was held in Washington D.C. on December 16, 1999 to celebrate the first twenty-five years of the SDWA. The event also served as a platform for discussions regarding what the future is likely to look like in terms of regulation of drinking water in the United States. Key speakers included Dr. William Alley, Chief, Office of Ground Water, USGS; Dr. Jeffrey Griffiths, Tufts University; and Dr. L. D. McMullen, Chair, National Drinking Water Advisory Council, and General Manager and CEO, Des Moines Water Works.

[18] A joint resolution was signed by the "drinking water partners" who participated in the year-long EPA sponsored Futures Forum that addressed the next twenty-five years of the Safe Drinking Water Act. Additional information on the Futures Forum is available on EPA's drinking water web site at: http://www.epa.gov/safewater.

[19] U.S. Environmental Protection Agency, *U.S. EPA's Safe Drinking Water Goals for 2005*, EPA 810-F-99-016, 1999.

[20] Alan Farkas and Joan Berkowitz, *The 11th Annual State of the Industry Report: A Mid-Year Review of Environmental and Infrastructure Markets* (Washington, D.C.: Farkas Berkowitz and Company, 1999).

[21] Ibid., 122

[22] Many of the “Camelot” characteristics were summarized from those offered in the detailed description for this scenario contained in the Rocky Mountain Institute’s report.

Eight Simple Ideas About the Future Of Utility Regulation

DAVID WIRICK *is the Associate Director for Client Service at the NRRI. He created and leads the NRRI's program to provide assistance to state public utility commissions engaged in transformation in response to changing utility and regulatory environments and led the NRRI's Y2K program.*

He has worked directly with many states and regulators making presentations on change, facilitating workgroups, assessing organizational readiness for change, and developing Y2K strategies. He has also authored reports and articles on a wide variety of topics.

He is a mediator and mediation trainer and a Certified Management Accountant. He holds an M.A. from Ohio State in Public Policy.

According to Mark Twain, "The art of prophecy is very difficult, especially with respect to the future." Such is clearly the case with regard to the future of the nation's public utilities and their public oversight. Much has changed in the past several years, and it can be argued that the pace of change is accelerating. Conditions and challenges prevalent in the fastest moving sectors of the global economy are spreading inexorably to all the others and will impact utility services soon.[1]

Despite the inherent difficulty of prediction, it may be possible to examine other economic trends and to extend some recent developments in utility markets and utility regulation forward to present some, albeit uncertain, visions of the future. Presented here are eight ideas, each having some basis in recent events that are likely to have an impact on the future of utility service delivery and utility regulation.[2] These eight simple ideas are presented in turn.

• Idea #1: Consent to Participate in Traditional Regulatory Processes is Gone or Going

In a general sense, regulatory agencies, and indeed all public agencies, exist based on the consent of those they regulate or oversee. This concept is embedded deeply in American government and found its early expression in the Declaration of Independence.

Though the traditional U.S. regulatory regime was created in response to court mandates, it has survived for nearly 100 years because it best suited the interests of regulatory stakeholders given the constraints established by those courts and policymakers. It represented a loose confederation of agreement between utility managers, shareholders and bondholders, business consumers, residential consumers, and regulators. There were periodic differences of opinion and considerable conflict, but those disputes took place within a system of regulation that was largely accepted by the parties.

Thomas Jefferson noted, that as governments (and, by extension, government agencies) derive their power from the consent of the governed, it is the right of those so governed to alter or abolish the relationship if it no longer fits. It can be argued that in recent years the consent of those regulated under the traditional regulatory regime has eroded and that the regulatory arrangement is being unilaterally terminated. Initially, rate-base/rate-of-return regulation gave way in favor of more performance-based forms of rate setting. The current drive toward more competitive markets represents a more fundamental erosion of the old regulatory bargain. Now, dissatisfaction with the regulatory regime and its perceived inability to keep pace with industry changes is causing assault on the regulatory institutions themselves.

It can be argued that in recent years the consent of those regulated under the traditional regulatory regime has eroded and that the regulatory arrangement is being unilaterally terminated.

The consent of certain stakeholders to participate in the traditional regulatory regime may have begun to erode because of perceptions of regulatory abuse. If that were the case, regulators could simply moderate their behavior and consent might be reestablished.

It is more likely, however, that consent eroded because some participants sought and found other and better options to the traditional regulatory regime. Though they did not formally withdraw from the traditional regulatory

agreement, utilities and large consumers of utility service went off seeking other venues for the establishment of regulatory policy. State public utility commissions were left to try to fashion a regulatory regime out of those who remained while these important stakeholders pursued their interests in legislatures and at the federal level. Under these circumstances, "better" behavior by state regulators within the current framework is not likely to reestablish consent.

Some public utility regulators may regard the idea that the regulatory regime exists only by consent of all the regulatory stakeholders, including utilities, to be anathema. Nonetheless, government functions in the U.S. only by agreement. A challenge for utility regulators in this environment is to find new mechanisms around which the consent of all the governed can be established. Without the establishment of an effective, agreed-upon model of regulation, regulatory processes may be unworkable. The result could be the dominance of regulatory policy by the legislatures for years into the future. In those states where term limits are the law, those legislators will be particularly hard-pressed to muster the expertise to make effective policy. Without effective public utility oversight agencies and processes, increasingly complex and vital utility policy may not get the attention it deserves. Consumers and the public interest, which includes economic development, may suffer.

- ## Idea #2: The Erosion of Boundaries

Public utility service delivery and public utility regulation in the past were heavily influenced by boundaries. Utilities were issued geographic franchise territories and then created an infrastructure that was designed to serve that franchise territory and no others. Overlapping service territories or competition for service elements within those territories was unheard of. Regulatory mechanisms were created to mirror those franchise territories. There were boundaries between utility provider types as well. Energy utilities did not venture into telecommunications and vice versa. Utility providers were identifiable by their service delivery infrastructure. Finally, society as a whole was less mobile. Companies of all types were a part of their communities and rarely relocated. Workers were less mobile.

Now, all of that has changed. The entry of competition into utility markets either has or will largely signal the end of franchise territories. Provider types are beginning to blur as utility companies diversify and as new market entrants compete for portions of utility service markets. Providers are no longer distinguished by traditional infrastructures as many new entrants compete for market share without building a physical infrastructure of their own (e.g., service resellers) or create different types of service delivery networks (e.g., cellular telephony).

More importantly for public utility regulators, industries and consumers have become more mobile. The result is competition between geographic areas for jobs and workers. High utility rates are one factor in that competition, and economic development has become a driving factor in utility policy creation. For example, it is unlikely that policymakers would embrace electric utility restructuring if it were not for the possibility that areas with relatively high rates might suffer from an out-migration of businesses, with an accompanying loss of jobs and tax revenue. Economic development remains a critical factor in the creation of utility policy.

Industries and consumers have become more mobile. The result is competition between geographic areas for jobs and workers.

In addition to the requirement that public utility commissions and all state policymakers attend to economic development, the erosion of boundaries poses problems for agencies created around those boundaries. More utility issues, like many mergers and acquisitions, now extend beyond state boundaries. Creating regulatory mechanisms and entities that are flexible enough to match the "footprint" of regulatory issues will be a challenge. Better coordination of regulatory efforts at the regional and national levels will be required, though the temptation should be resisted to superimpose a federal regulatory regime on the nation as jurisdictional control and oversight seems to shift from the states to the nation.

• Idea #3: Decreasing Regulatory Attention to Service Providers

In the future, utility service will become less of a commodity than in the past. Already, service differentiation has begun to affect telecommunications offerings. The same thing is likely to happen in any utility sectors into which competition intrudes to disrupt the incumbent utility. Few new entrants to emerging or partly competitive utility markets are likely to attempt to gain a competitive advantage over incumbents through head-to-head competition. Head-to-head competition takes tremendous resources. It is likely, therefore, that some new entrants will attempt to find niches within which they can unseat incumbents. To do so, they will attempt to add unique value to their service offerings. The telecommunications industry has already seen an explosion of service offerings, which include caller-ID, call-waiting, last-number-dialed, and internet connectivity. Indeed, the principal benefit of competition in utility markets may be an increase in service value rather than a decline in commodity prices.

As service offerings become more diverse, as utility service providers increase in number, and as more varied organizations become a part of the service delivery mix, it may become more difficult for regulatory commissions to define or even identify service providers. The recipient of the service, however, will remain clear and easily identified. To accomplish public purposes, the focus of commissions will need, therefore, to shift from utility providers to utility service recipients. For example, telecommunications universal service subsidies are currently provided to utility service providers. If providers are difficult to identify, universal service subsidies could be provided to consumers much in the same way food stamps are provided directly to the consumer of the service rather than the producer or supplier.

A PricewaterhouseCoopers report on the electric utility industry in Great Britain predicts a scenario in which utility service providers will split into two types, with an elite few competing for customer loyalty while the alternative for others will be the provision of "back-room" services such as billing, customer contact, and debt collection.[3] According to the report:[4]

> The old boundaries between services that shape current customer relationships will be swept away and synergies between energy, retailing, telecoms, media, finance, and other services will be exploited. Changes in technology and consumer attitudes will herald an era of "open-sky retailing," enabling companies to secure much bigger market space with customers. This race to create market space will transcend the old "legacy market" categories. The successful companies will create winning positions by creating brand and service strategies that respond imaginatively to underlying customer needs.

According to James Moore, it is even inappropriate to discuss the utility "industry." He says:[5]

> The notion of "industry" is really an artifact of the slowly paced business evolution during the middle of this century. The presumption that there are distinct, immutable businesses within which players scramble for supremacy is a tired idea whose time is past. It has little to do with what is shaping the world. The designation itself is simplistic, describing certain players better than others. But, in truth, the label is not much more than a crude grid used to compare and contrast businesses, a fiction conjured up by policymakers and regulators, investment analysts, and even academic students of business strategy.

The result of this expansion in the number of service providers, a proliferation of service offerings, the end of "industries," and the entry of competitors which do not fit the standard provider profile, will be a shifting of the attention of regulators away from those who provide the service toward those who receive services. Consumer protection will likely become an even more important tool in the arsenal of regulatory commissions. Consumers will need to be protected from internal market failures, which include fraud and deception. They will also need to be protected from external market failure, which occurs if competitive markets fail

to function for all consumers. To accomplish these functions, commissions will need to retain the power to sanction service providers.

> Consumers will need to be protected from internal market failures, which include fraud and deception. They will also need to be protected from external market failure, which occurs if competitive markets fail to function for all consumers.

To accomplish this shift in attention, public utility regulators may have to abandon or decrease their reliance on traditional methods of regulation and bring new skills to the job. Already, commissions are increasing the resources devoted to consumer affairs and consumer education.

• Idea #4: The Increasing Importance of the Information Infrastructure

Utility service provision has been and will continue to be infrastructure dependent. In the future, however, service providers will pay more attention to the information infrastructure than to the traditional physical infrastructure. For example, incumbent telecommunications providers are finding that their competitors are targeting their most profitable customers. In the future, service providers will continue to mine the information infrastructure for revenue-generating opportunities. Most of these opportunities will be legitimate, though some will exploit weaknesses in the information infrastructure to deceive consumers.

As competition among utility providers shifts to competition based on knowledge derived from information, the focus of regulators will also shift from concern over the physical infrastructure to concern over the information infrastructure. Recent problems with "slamming" and "cramming," alleged delays in transferring customers from one provider to another, and the Y2K experience indicate that the current utility information infrastructure is also flawed. In the case of slamming, that component of the information infrastructure that allows customers to move from one provider to another was flawed in that it did not require adequate transaction verification before initiation of the change. In the case of Y2K, the flaws in the information infrastructure were apparent to those attempting to gather information with which to measure and ensure utility preparation.

In ensuring that an effective infrastructure is created and maintained, the objectives of public utility regulators will include:

- Ensuring that effective competition can take place.
- Ensuring that utility markets function efficiently (in part because efficient markets provide an edge over competing jurisdictions).
- Accomplishment of other public policy objectives, like universal service.

Those who might participate in the construction and operation of the utility information infrastructure might include the utilities; the financial markets; public agencies including the Department of Defense, emergency management agencies, public utility commissions, and departments of economic development; private entities, such as *Consumer Reports* magazine; regional utility organizations, like the ISOs and regional reliability councils in electricity; and new entities established explicitly to oversee information infrastructure issues and coordinate responses. Indeed, as market participants proliferate, the task of maintaining the information infrastructure will become more complex.

Without doubt, the private sector can be relied on to create much of the utility information infrastructure. But, as Peter Drucker states, we cannot expect the public interest to "emerge out of the welter and clash of competing interests."[6] Private companies, after all, have an interest in exploiting faults in the information infrastructure.

Legislators have discovered options to traditional regulatory methods and have begun to reassert control over regulatory policymaking.

Without an adequate information infrastructure to support utility service delivery, consumers will be disadvantaged, defrauded, and unable to make effective choices, competition will be diminished by information barriers, utility providers will find it difficult to identify revenue-generating opportunities, and public interest outcomes will be frustrated.

- ## Idea #5: The PSC Regulatory Monopoly Is Dying

In the days of monopoly service providers, there existed a regulatory monopoly as well. In the early days of utility regulation, the courts ended the process of legislative rate setting, which required the creation of quasi-judicial regulatory commissions. Later, legislators for the most part lacked real policy options and ceded the management of utility markets to those quasi-judicial public service commissions. Regulatory processes and regulatory policymaking were largely the province of regulatory commissions. Recently, however, regulatory policy has been placed back on the legislative agenda, in part due to concerns about state economic development. Legislators have discovered options to traditional regulatory methods and have begun to reassert control over regulatory policymaking. In some cases, they have made regulatory policy in close coordination with the local regulatory commission; in other cases, regulatory commissions have not been involved.

Other state agencies have also increased their involvement in regulatory policymaking. States attorneys general have expressed interest in merger and acquisition issues; state consumer counsels, where they exist, have expressed an

interest in consumer affairs and education; and, ultimately, state human service agencies may become involved in consumer issues like universal service.

As long as regulatory policy occupies a prominent place on the legislative and executive branch policy agenda, a variety of policymaking entities are likely to express interest in these issues and, in some cases, may compete with one another for control of utility policymaking. The likely result is that regulatory policy development will become more complicated and, perhaps, more contentious.

For state public utility commissions, these changes require the development of effective alliances with the legislatures and other agencies. The state legislature will always have the ability to declare primacy in policymaking but may allow state commissions considerable latitude in implementation and may in some cases direct the commission to take the lead in policymaking. The goal would be to make the best use of the abilities and powers of each entity involved in utility oversight.

- **Idea #6: The Traditional Regulatory Model is Under Duress**

According to Richard Stevenson of *The New York Times*, "In an economy that changes as swiftly as this one, driven in particular by breathtaking technological advances, it is clear that government faces a growing challenge in keeping pace with what is happening on the front lines of business."[7] His comment is particularly true in public utility markets where the tools of regulation have been constructed to guarantee fairness rather than effective and rapid decisionmaking. Critics of the traditional public utility regulatory model are becoming more vocal.

Though most would agree that quasi-judicial proceedings have served commissions well in the past for ratemaking, they may not be ideal for the current environment, which requires more policymaking, and may not be well suited to future commission decisionmaking. The traditional quasi-judicial mode of regulatory decisionmaking suffers from four significant shortcomings.

First, the quasi-judicial process functions best in retrospectively determining facts. In rate cases, even those states that used a future or partially-projected test year relied on a historical test year as the basis of the projection.[8] As more utility industry issues address projections and expectations of future events and market conditions, it becomes cumbersome, at best, to rely on quasi-judicial procedures.[9]

Second, the quasi-judicial process tends to emphasize the fairness and integrity of the process of regulation over its outcomes. According to Thomas McGraw, author of the book *Prophets of Regulation*:[10]

> On balance...it seems clear that the concern about the legal process has controlled the outcome of regulation more often than has

> the concern about the substance of economic efficiency. In economists' language, this means the concern for equity has generally triumphed over the quest for efficiency.

Though some would argue to the contrary, most agree that the quasi-judicial model has provided a fair opportunity for parties to represent their views and that it has overcome some of the information and resource asymmetries that exist between the parties to a regulatory proceeding. For those reasons, the quasi-judicial model will continue to have its supporters. Unfortunately, the attention given to the fairness of the quasi-judicial process may have handicapped its effectiveness. It may be that the quasi-judicial model implicitly gave fairness priority over effectiveness. While not abandoning the pursuit of fairness, it may be that the time has come to assign a higher priority to effectiveness and amend regulatory processes to reflect the change.

Third, the quasi-judicial process tends to be reactive rather than proactive. It is largely event-based, requiring events to transpire, such as a rate case being filed or a motion by staff to reduce rates, before a procedure can be initiated. According to former FERC and Illinois Commerce Commission member Charles Stalon:[11]

> It is not too surprising that an agency that has taken its role to be passive, to respond to pressure by others, never carved out one of the very important tools to exercise its power. The reason goes to the heart of this organization and many other regulatory bodies...There is this tendency to be judicial. To adjudicate disputes. To be passive.

Lastly, the quasi-judicial model may not produce good, or good enough, results. Specifically, consensus building and the introduction of innovation are particularly difficult. "Thinking outside the box," the over-used euphemism for thinking creatively, is specifically prohibited once the quasi-judicial process has been initiated. According to Robert Burns:[12]

"Thinking outside the box," the over-used euphemism for thinking creatively, is specifically prohibited once the quasi-judicial process has been initiated.

> ...because the commission must limit its decision in a trial-type procedure to the record as presented by the parties, certain innovative ideas and solutions might not be brought to the commission's attention. Commissioners may be restricted from using their own best judgements and ideas because of an inadequate record, yet the adjudicatory format can preclude the opportunity for commissioners, acting as judges, to introduce their own expert opinions. This may not lead to the best resolution of the issues.

In the past, the regulatory environment could have been regarded as being circular, with

issues and companies repeatedly and regularly coming to the attention of regulators. The current environment is linear, with decisions made once for industry sectors as a whole rather than for individual companies. The pace of movement along that linear axis is accelerating, and it is unlikely that the traditional quasi-judicial models that protected the public in the circular environment can provide effective regulation without the aid of other models amid the breakneck pace of linear policymaking.

• Idea #7: New Times Demand a Mix of Regulatory Models

Some business strategists would argue that organizations should not attempt to accomplish multiple missions; "sticking to the knitting"[13] served to ensure that an organization made optimal use of its core expertise. In a time of turbulence bordering on chaos, however, the exploration of new models and processes is imperative as is some "diversification" to allow new initiatives to flourish, because these new initiatives, while initially operating peripherally to the organization's typical models and processes, might ultimately hold the key to organizational success.

In the recent past, many public utility commissions have made forays into the use of new models of regulation and, in some cases, are making fairly extensive use of them. Four alternative regulatory models can be identified:

- The "legislative or policymaking" model. In the policy model, the primary focus of regulatory processes is effective decisionmaking (as opposed to the focus on fairness that characterizes judicial models). Alternative dispute resolution and procedural streamlining are examples of the use of the policy model by state commissions.
- The "regulation by information" model, which includes building and maintaining the "information infrastructure" necessary for more competitive markets. Keys for commissions in this model are maintaining their credibility, identifying the information needs of consumers, establishing information networks, and forbearance in the application of regulatory authority.
- The "regulation by negotiations" model, which aims to create innovative, win-win outcomes accepted by all parties. Keys for commissions include identification of the public interest, bringing affected parties to the table, minimizing resource disparities, and creating a negotiations infrastructure. This model includes the negotiation of disputes between non-jurisdictional entities.
- The "consumer protection" model. This model includes the protection of consumers from external market failures (i.e., problems created by the lack of effective competition) and internal market failures (i.e., fraud and consumer deception). Tools employed by commissions may include market

monitoring, licensing, research, establishment of standards, and response to deceptive and unfair practices.

These models are explored more fully in the NRRI report, *New Models of Regulatory Commission Performance: The Diversity Imperative.*[14]

This is not to say that state commissions have fully abandoned or should abandon the quasi-judicial processes that have been their mainstay. Indeed, traditional norms of public utility regulation can be argued to have been highly successful, and those traditional processes may continue to optimally serve certain purposes and be best suited for the resolution of some issues. Nor is it expected that any commission will fully adopt any one of the models presented here. Rather, it is expected that each commission will evaluate these models, take what is best from each, and create a multidimensional regulatory regime best suited to the needs of the state.

Some of these roles and models might be temporary and might be eclipsed by different models not thought of today. According to Peter Drucker, "A new program...should be enacted for a limited...period of time, with a clear statement of the results it is expected to achieve within that period, and with explicit commitment to abolishing it if it should fail to produce the promised results."[15]

- **Idea #8: Public Utility Oversight Will Continue**

Public utility commissions are not, as some have argued, merely proxies for competitive markets; they cannot be dismantled as soon as competitive markets are created. Thus far, in fact "deregulation" has resulted in the growth of public service commission workloads. To be sure, the major activity undertaken by public utility commissions in the past has been the creation of regulatory mechanisms that served as market proxies in order to protect the public from the abuses of monopoly service. Even then, however, traditional regulatory mechanisms were the tools used to accomplish a greater end—the protection of the public.

For the foreseeable future, the public will demand that government play a role in the provision of these vital services.

Public utility commissions have existed, and will continue to exist, to serve the public interest, a public interest that is embedded in utility service. Utility service is different than other services purchased by the public because of its importance to economic development, health and safety, and the environment. For the foreseeable future, the public will demand that

government play a role in the provision of these vital services. Those who think otherwise need only observe the reaction of the public to utility service outages or price increases.

Even if competitive markets are successful, it will be necessary for government to attend to these public interests, which include service reliability, universal service, economic development, safety, and environmental concerns. Competitive markets will also need to be closely monitored to ensure that external market failure does not occur.

Conclusions

From these eight simple ideas, seven additional conclusions can be reached:

- One of the problems for those attempting to predict or regulate the public utility industry is that the changes affecting the utility industry are not simply linear. Given their pace, they are possibly geometric, but perhaps can be described more accurately as chaotic, with technological and marketplace developments emerging without clear antecedents. The largest challenge of state regulators may be to attempt to address rapidly evolving and chaotic developments with processes designed to accommodate slower-moving, linear change.
- Given the chaos of technological change and the demise of boundaries of all sorts, the regulatory environment is likely to be characterized for some period by disruption and pain. Changes of the magnitude being experienced will create stress on regulatory processes and players. As regulatory commissions struggle to find new methods and models, there will be some failures. As markets evolve, there will also be some uneven treatment of consumers. Prevention or minimization of that disparate treatment is a worthy goal of regulatory commissions.
- To cope with chaos, regulatory commissions will need to develop new ways of making policy, ways that do not rely as heavily on linear, deliberative processes. Balancing the rights of stakeholders will be a challenge. In addition to defining new missions and regulatory objectives, commissions will need to make decisions about what they are not able to do. In order to keep up with the pace of change, effectively employing commission resources will be a must; resources devoted to functions of little import are resources wasted. What is needed is “distention,” defined by Wacker and Taylor as the refusal to involve yourself in issues of no relevance.[16] For commissions, decisions may need to be made about which activities to discontinue.
- Commissions will share the “regulatory space” with other organizations and agencies. The regulatory monopoly is gone, though monopoly markets will remain for at least some time in distribution and network functions. Many

other players, including legislators, want to have a say in the development of utility markets and policies. Commissions will need to form alliances with them that make optimal use of the unique skills of each group.

- Information exchanges will increase in importance. In the past, consumers did not need much information about utility service, and utility and commission information exchanges were constricted into narrow information "pipes" that formed fixed connections between utilities and regulators. In the future, the stock-in-trade for consumers, incumbents, competitors, and regulators will be information derived from a variety of sources. In the future, consumers will demand and get more information and, as a result, more power to define their utility service.
- The power of regulatory agencies (and their longevity) will be based on their effectiveness rather than on their statutory base. Credibility will count more than authority, though baseline authority is a precondition for success. Commissions that have mastered a diverse tool kit as a replacement for the traditional unidimensional, quasi-judicial model will likely better serve the public than those that do not.
- Oversight of public utility service provision will continue to be necessary. Even if markets become workably competitive, there are public interests embedded in utility service, interests like safety, universal service, economic development, reliability, and environmental considerations. The public cannot and will not be abandoned to fend for itself any time soon.

Making the transformation from traditional regulatory models to the ones described here will not be simple. Making fundamental changes in regulatory agencies while they are in the midst of overseeing industry upheaval may be as complicated as, "trying to rebuild a 747 while in flight," as Chairman Kennard recently said of FCC reform.[17] Nonetheless, the stakes for commissions, service providers, and the public are high, and the battle to recreate effective regulatory agencies, though it may seem herculean, must be joined.

Endnotes

[1] James F. Moore, *The Death of Competition: Leadership and Strategy in the Age of Business Ecosystems* (New York, NY: HarperCollins Publishers, 1996), 17.

[2] Some of the arguments presented in this chapter are also explored in David W. Wirick, *New Models of Regulatory Commission Performance: The Diversity Imperative* (Columbus, OH: National Regulatory Research Institute, 1999).

[3] PricewaterhouseCoopers, "Open Sky Retailing: The Future of the UK Utility Retail Market," May 1999.

[4] Ibid., 1.

[5] Moore, *The Death of Competition*, 13.

[6] Peter F. Drucker, *The New Realities in Government and Politics/ in Economics and Business/ in Society and World View* (New York, NY: Harper and Row, 1989), 93.

[7] Richard W. Stevenson, "Playing Catch-Up With Monopolies," *The New York Times*, November 14, 1999, 16 WK.

[8] Ibid., 5-6

[9] Robert E. Burns, *Administrative Procedures for Proactive Regulation* (Columbus, OH: National Regulatory Research Institute, 1988), 5.

[10] Thomas K. McGraw, *Prophets of Regulation* (Cambridge, MA: Harvard University Press, 1984), 302, as cited in Burns, *Administrative Procedures for Proactive Regulation*, 7-8.

[11] "Commissioner Stalon: A Natural in FERC's Economic Regulatory Mission," *FERC Monitor*, June 13, 1985, 1, 10, as cited in Burns, *Administrative Procedures for Proactive Regulation*, 6.

[12] Burns, *Administrative Procedures for Proactive Regulation*, 6.

[13] Thomas J. Peters and Robert H. Waterman, Jr., *In Search of Excellence: Lessons from America's Best-Run Companies* (New York, NY: Warner Books, 1982), 292-305.

[14] Wirick, *New Models of Regulatory Commission Performance: The Diversity Imperative*.

[15] Drucker, *The New Realities*, 68.

[16] Watts Wacker and Jim Taylor with Howard Means, *The 500 Year Delta: What Happens After What Comes Next* (New York, NY: HarperBusiness, 1997), 233.

[17] William Kennard, as cited by Jenna Greene, "FCC, Facing Critics, Starts to Send New Signals," *Legal Times*, August 13, 1999, downloaded from CALLAW at www.callaw.com/stories.