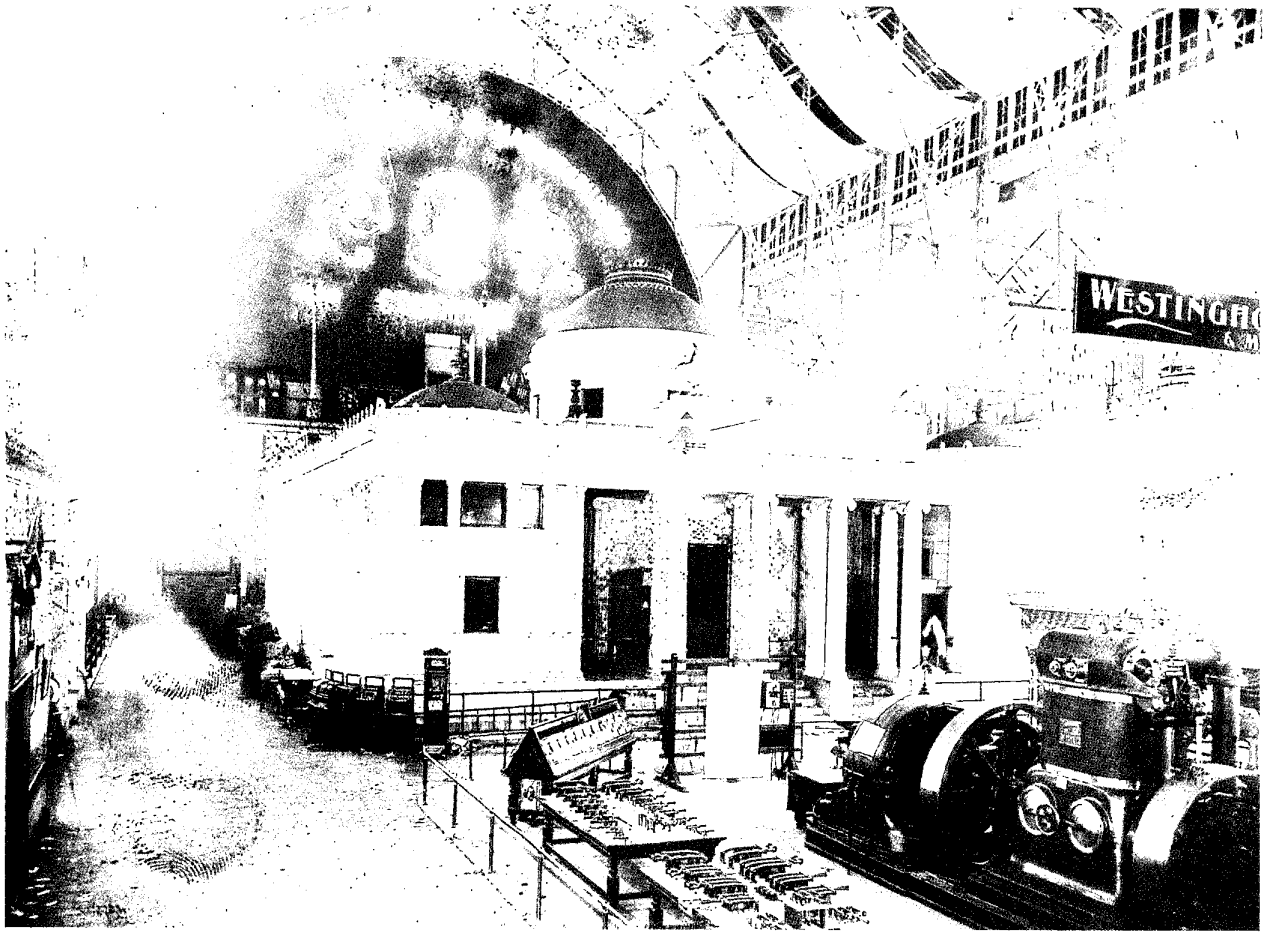

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Electric Re-Regulation Impact

Robert A. Durham and Marcus O. Durham

Present-day electric utilities are the logical outgrowth of the development of electricity as a clean, reliable power source. In fact, many electric utilities started as large consumers who developed into suppliers. As dependence on electricity grew, regulation on the federal and local level increased as well. The industry essentially became a regulated monopoly in 1935. The history of the electric power system, and the growth of regulation is chronicled. As regulations grew, ancillary associations were created to solve a perceived void in some markets. These organization grew in authority, even after they were no longer necessitated by the technology of the sector. As a consequence of increased regulations, technological advancement was stymied.

Currently, many consumers see the electric utility industry as the last controlled monopoly in the country. They are demanding changes which they expect will bring decreases in prices. Consequently, the states are freeing their regulations. At the same time, the federal government is making strides toward releasing utilities from some of the cumbersome, outdated regulations of the past. A brief description is given which shows the variety of pro-

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posals and timetables being examined at the present time.

Changes in the electric business are closely tied to changes undergone by other regulated industries. Of particular interest to this organization are parallels to the re-regulation of the oil industry. Analogies are drawn between the oil industry in particular and industry in general.

New models are being proposed and implemented by many separate organizations. Each proposal is justified by the perceived or desired effect on consumers. Several of the more dominant models are investigated, along with some unique proposals that have recently been examined. From these models, and the parallels to other industries, an appropriate model for a competitive utility industry is proposed.

Many customers view these changes as ones which will finally keep the utility companies from having secured, fixed prices and guaranteed profit. This is true. However, there are risks that will pass to these customers as well, particularly the small residential user. The optimal system will be one which balances the needs of the energy providers, the resellers, the large industrial customers, and the residential consumer.

History

Utility Life Cycle

Electric power systems got their first major public exposure during the World's Fair of 1893. There, George Westinghouse lit the exhibition halls, midway and the "Tower of Lights" using a polyphase design by probably the most brilliant inventor of his time, Nikola Tesla. Before this, electricity was limited to a small generator supplying a isolated load, such as a single building or even a single device. The World's Fair system demonstrated the viability of ac power to supply a large system of loads.

Shortly after this, demand for electric power increased rapidly. By the turn of the century, there were several large industrial users of electricity. Ice plants were a prime example. Because there was no existing electric grid, these customers had to create their own generation facilities. As a service to the local community, and more importantly as a profit generating activity, these plants began supplying electric power to other users in the surrounding area. As this arrangement grew in size, several of the large utilities that we know today were formed.

At the same time, cities began developing their own power systems. The usefulness of electricity in an industrial and a residential capacity served as an incentive for industry, as well as wealthier residents, to move in. The progeny of these first systems still exist in several of the municipal networks of today. Other utilities, such as the Tesla-Westinghouse design at Niagara Falls, were developed from the onset as a profit-generating activity.

By the early 1920's, several large investor-owned utilities were in existence all across the country. These were originally developed by technologists, such as Edison, Westinghouse and others. As with the oil, telephone, steel, railroad, and airline industries, after technologists developed many independent operations, a few shrewd magnates acquired, cajoled, and otherwise obtained control and ownership of the entities. This was a true unregulated environment, even if it was an oligopoly.

In each of the industries mentioned above, the federal government created authority to regulate private industry. The result was several smaller concerns that, in one way or another, had limited risk for return on investment. This was accomplished through licenses, rate control, or route allocation. As industries mature, public policy tends to break-up the regulated entities. Again operating in a somewhat freer, re-regulated marketplace, only a few of the strong survive.

As with other previously heavy regulated industries, there is increasing pressure to loosen the constraints on the electric utilities. Popular opinion believes that this will allow the entrance of a large number of additional players. Nevertheless, the expected result will be a few large, viable electric utilities.

Fig. 1 depicts the life cycle that regulated industries undergo. At the beginning of the life cycle is a dream, a *concept*, or a new idea. This will spur new technology, but first it must go through a difficult *development* phase. During a *growth* phase, the system reaches critical mass; it can progress merely on its own merits, and rapidly increases profits for those that were willing to undertake the initial risk. As perception of a monopoly develops, government agencies enter, in the form of *regulation*. This brings the industry into a period of slow, but steady, growth.

After a period of time, consumers see the limited risks incurred by operators and begin to demand a competitive environment. They push for *deregulation* to lower the price of services. This causes an industry-wide decline, and even the elimination of a number of the original players. As the remaining suppliers expand their vision to deal with competition, technology increases and the industry enters another period of *technological growth*. As long as these companies continue change and

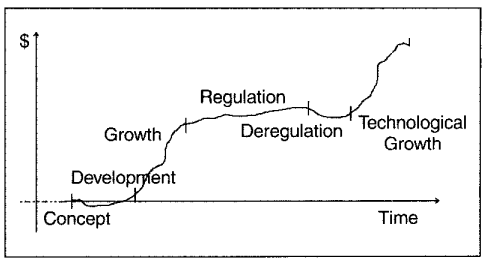

Fig. 1. Regulated industry life cycle.

increase their technological level, the growth will continue [1].

Federal Regulation

Utilities became state-oriented to avoid increasing regulations by the federal government. In 1935, the Federal Power Act (FPA) was implemented. Under this act, the Federal Power Commission was created. This later grew into the Federal Energy Regulatory Commission (FERC). The act gave the federal government power to impose a regulated structure on the utility industry in order to restrict "undue discrimination" in the competitive market [2], [3].

Under the FPA, electric utilities were declared to be "natural monopolies" on the basis of geography. As a result, a territorial based, vertically integrated structure was proscribed [3]. Nevertheless, many of these "local" utilities were owned by the same large interstate holding companies.

To combat this, the Public Utility Holding Company Act of 1935 (PUHCA) was promulgated. PUHCA gave the SEC power to regulate the "handful" [4] of holding companies that controlled the power market at the time. The power of SEC applied only to those companies which operated across state boundaries.

The Act imposed a requirement not only for disclosure of transactions to the SEC, but unprecedented review of transactions and restrictions on activities. One contemporary scholar stated that the act "gave the SEC power to refashion the structure and the business practices of an entire industry. Except in wartime, the federal government never before assumed such total control over any industry" [4]. As a result, the big break-up of the thirties caused most companies to stay close to home and avoid interstate activities.

Ancillary Organizations

In addition to federal agencies, the logical offshoot of a regulated environment is a state entity to control the industry. In fact, the impetus for exempting single state companies from the PUHCA was sufficient state oversight. These state commissions operate with limited constraints on their control. Their job is to provide regulatory protection for the consumer. Therefore they do not have a great impetus to enhance the industry. Consequently, an oversight infrastructure flourishes while technological advances and system expansion are stymied.

Every state has some form of regulatory body to oversee utility industries, including the electric utility. As old restrictions are lifted and new regulations put in their place, these state agencies should and will play a major role in shaping the future of previous regulated industries. It is infinitely more logical for a local agency to deal with local issues, than to try to impose a single solution for the entire country.

Other spin-offs are quasi-government agencies to compete in the marketplace. Usually these were implemented to provide service in underdeveloped or developing areas which originally had little commercial interest. Agencies are often implemented through mandate, such as was the case with the Tennessee Valley Authority and the Bonneville Power Administration. Additionally, they may be implemented through subsidies or low cost loans, as is the case with Rural Electric Cooperatives. On a smaller scale, cities initiated municipal power authorities. Some of these formed coalitions to provide direct competition to electric utilities. Even after development comes to a region, governmental agencies tend to be perpetuated rather than released to the marketplace. In too many instances, quality of service suffers because of political considerations or lack of technical experience.

As early as 1955, the Securities and Exchange Commission stated that the primary purpose of the Public Utilities Holding Company Act had been accomplished [4]. However, no substantial changes occurred to the laws until the Public Utilities Regulatory Policy Act of 1978 (PURPA) was passed.

PURPA created a rift in the vertically integrated structure of the electric industry. The primary purpose of PURPA was to promote domestic energy sources, including renewable energy. In order to implement these goals, utilities were forced to purchase power from non-utility generators which used co-generation or renewable energy sources [5], [6].

However, another result is that a whole new class of power generator was created: the Independent Power Producer (IPP). The IPP would come into an area and aggressively market industrial customers for agreements to use a co-generation facility for that plant's electricity and heat demands. The IPP would then sell any auxiliary electricity to the utility. In many cases, the amount of heat load supplied to the facility was less than 10%, with over 90% of the co-generation facilities energy was used for production of electricity. This is more appropriately defined as a separate generation facility, rather than a co-generation facility.

This power is not sold to the utility simply at the same cost as other utility power. On the contrary, the law stated that the IPP would be reimbursed for the avoided costs that the utility incurred. The utility's position would be that the avoided cost was simply the fuel required to run a facility, since the plant and equipment were a sunk cost. The IPP's position, however, was that avoided cost was the cost of a new plant construction.

In many states, the avoided cost was held so artificially low that very few suppliers developed. In other states the avoided cost was raised high enough that a large number of facilities were created, whether or not the power was really needed. The producers in states where the avoided costs were

low began a campaign for continued re-regulation and legal changes which would benefit them.

Under this type of system, the producer supplies electricity to the utility under some semblance of oversight. Often neither entity is competitive but survives by living on the rules of the regulation. In a totally free marketplace for generation separate from distribution, the low cost producer would succeed.

Current

Parallels To Oil

The restructuring of the electric utility industry is closely following that of the oil industry in the last decade. That industry was composed of a few very large vertically integrated companies and literally thousands of small independent producers. During restructuring, the large companies have divested many properties and reorganized the operating segments into separate companies.

There is a direct correlation between the industries. Generation is production, transmission is pipeline, while refining and marketing is one avenue of distribution and chemical is another.

Production is now in the realm of fewer independent producers. These are often composed of segments of former "competitors" who have joined in an area to form another entity. The number of very small producers has dropped dramatically as the price of oil has reached parity. The price now corresponds to the long term, inflation-adjusted value of the commodity, rather than the speculative and regulated prices of over a decade ago.

Separate common carrier pipelines now provide transportation. In some markets, tariffs are regulated. The transporters purchase raw product from anyone in the area. This is resold to refiners. Product pipelines purchase the refined products and resell to marketers.

The natural gas industry requires little processing so the corresponding refining step may be performed by the producer or the pipeline. The gas is purchased from producers and then sold to distributors in a different part of the country.

There are industry standards established by a consortium of the corporate players. This is primarily the American Petroleum Institute, with numerous other related professional organizations. The standards are developed by professionals in the industry who work for their respective companies. The standards are developed on an ad hoc basis as a perceived problem arises. This is a voluntary group which changes with each new development. There is a small paid staff that publishes the standards, maintains continuity, and provides a focal point for lobbying activities [7].

These standards dictate the quality and form of product. Therefore each player is responsible for its quality. If the product deviates from the standards, there is a substantial penalty or rejection. The producer may improve the quality, or the pipeline may provide the service while paying a lesser price for the product. The transporter or pipeline assumes the role of system operator without the need for a separate entity. With numerous suppliers and customers in a commodity market, the competitive marketplace quickly resolves problems.

Pricing is another interesting aspect. The gasoline and oil segment has many outlets. This natural competition keeps prices the cheapest in the world. In countries where this is regulated, prices are multiples of US prices.

Like the electric utility, the natural gas segment generally has only one vendor in a market. This is not as much a function of necessity as it is a function of regulation. Regardless, this gas price has been constrained to the consumer because there are many pipelines who can purchase the gas from the producer and sell it in different markets. These separate transporters provide the competition for the produced gas.

The petroleum industry has developed over the last hundred years. It has been a mix of regulated, common carrier, and free-market. It is still undergoing change, as any dynamic society must. Consequently, there is little reason to panic about the changes in the electric utility industry.

A freed-up, unregulated industry will reach equilibrium. There will be a few overshoots and disturbances as the system adjusts to market control from government control. However, the long term result will be a more dynamic, competitive environment.

Industry Reorganization

The electricity industry is in the throes of reorganization, just like every other industry in our technological society. The optimal structure has been proposed in a previous paper [8] as follows:

"Companies that flourish become managers of technology. The major chore becomes coordination between the three corners of the product triangle—suppliers, marketers, and transporters. The technology is developed and provided by outside sources. The managers develop a distribution system to the client for the product. It may take on a private label or a widely recognized branded moniker. The remaining pin of the triangle is responsive transportation for movement of products and information.

"Under this structure, the individual risks are limited. Nevertheless, managers can draw on the financial strength of the suppliers. Different levels of risk are allocated to the independent entities.

"Within an information society, this is the optimum system. The technologists in each of the corners of the triangle, the manager, and the client are independent. However, the network shown in Fig. 2 makes a winning system for all.

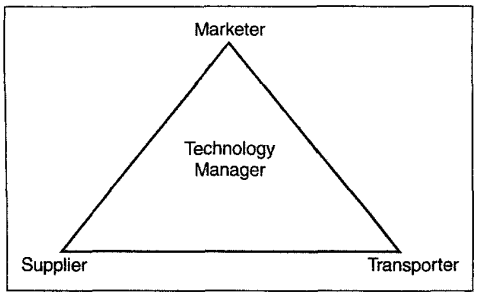

Fig. 2. Network for technologists [8].

"Although the support system appears as a triangle, the client sees only a straight line. From his perspective, all the components are collapsed into a telescope under the marketer" [8].

Using this model the utility structure will be generation or suppliers, transmission or transporters, and distribution or marketers. The specific relationship between these entities will be discussed in a later section.

Darkness And Light

The dispersal of operation and perhaps ownership of assets provides an interesting problem of quality control. In a vertically integrated system, one entity is responsible for reliability of the system while fulfilling the "obligation to serve" the client.

However, the dispersed system has a generation company, or supplier, that is primarily interested in return on investment. If a unit is not operating, he may decide to "leave it down" rather than make heroic efforts to reestablish the supply. This places the marketer in jeopardy if he can not find a competitive alternate supplier. The ultimate loser is the client.

Reliability is another issue that is very apparent in a digital age. Every time there is a blip on the power system, clocks must be reset. To combat this, uninterruptible power supplies (UPS) are commonplace for computer systems.

Presently, the North American continent is divided into areas for supply of electricity as shown in Table I. Each of these regions has all power systems connected into a grid. The grid effectively becomes an infinite bus. The direction of flow of electricity is essentially uncontrolled. There are enough "spinning reserve" generators on-line to handle most upsets.

Meters are placed on the inter-tie lines to monitor the flow of power. At the end of a billing period, the cost of exchanged electricity is resolved according to a predefined rate schedule. There is a requirement for utilities who are members of the reliability council to maintain additional, available generation in order to maintain voltage control in an upset situation. This is commonly referred to as a "spinning reserve."

In a totally dispersed system, no one would voluntarily maintain a "spinning reserve" since there will be no revenue associated with the fuel and operating costs. Effectively, the grid becomes weaker and less like an infinite bus. A substantial upset can cause the entire grid to shut down.

To combat this, there must be some industry consensus on the value of spinning reserve. Generation companies must then be compensated for this reserve capacity, even though the power is not actually being sold [10].

California has a large concentration of load. In addition, it has the largest percentage of power supplied by IPPs. This extraction from the utility rate base has led to a marginally stable grid over the entire western part of the continent. Twice in one year, on July 2 and August 10, 1996, the grid collapsed into darkness, causing a loss of power to parts of 14 states and 2 Canadian provinces.

According to EPRI, there were several "high level observations which can be made regarding basic causal factors in both outages" [16]. Each of these conditions can be expected to worsen if significant changes are made to the regulatory environment, without appropriately addressing technical and institutional changes.

Of particular interest are the first two factors in Table II. The first area deals with the transmission system. If significant investments are not made in the transmissions system, we can expect the margin of reliability transmission capabilities to decline. According to EPRI, "By stressing the transmission system more, we have reduced margins which might have provided extra reliability in the past." [16]

The second area is related to the generation system. As was mentioned earlier, there is a large concentration of non-regulated generation entities. These entities, in general, are not part of the North American Electric Reliability Council (NERC) control system. As a result, they are not required to maintain a spinning reserve. As more and more generators come into the picture, the voltage support in a non-controlled system will be "soft" [9]. This emphasizes the need for some compensation

Table I. North American Reliability Associations [9]

ECAR	East Central Area Reliability Coordination
ERCOT	Electric Reliability Council of Texas
MAAC	Mid-Atlantic Area Council
MAIN	Mid-America Interconnected Network
MAPP	Mid-Continent Area Power Pool
NPCC	Northeast Power Coordinating Council
SERC	Southeastern Electric Reliability Council
SPP	Southwest Power Pool
WSCC	Western Systems Coordinating Council *(Affiliate)*
ASCC	Alaska Systems Coordinating Council

Table II. Causal Factors Contributing to Western Outages [9]
Factor 1 - The Transmission network is being stressed more than ever and more than the systems were originally designed for.
Factor 2 - Not enough reactive (VAR) support was available in the area, particularly dynamic *(generator)* support that could produce more VARs when needed.
Factor 3 - The initiating conditions and events had not been studied.
Factor 4 - Operators did not understand they were approaching voltage instability.
Factor 5 - No one had the big picture.

for companies to maintain additional generation for voltage support.

National Changes

The legislative session of 1992 brought about the most significant changes in the utility industry to date. The Energy Policy Act of 1992 (EPAct) amended the PUHCA and the FPA in three key areas: free access to transmission, wholesale generation, and ownership in foreign utilities. Changes related to transmission were implemented by a FERC Notice of Proposed Rulemaking (NOPR) that was promulgated in 1994.

Media attention has been focused on the changes to the code which affect transmission. These changes have been popularly referred to as regulations on "wheeling." Wheeling is the movement of electricity from one utility system to another, through another system which is geographically interposed between the two. For example, were a utility in southern Nebraska to sell electricity to a customer in Northern Oklahoma, it would have to wheel the power through an intermediary in Kansas.

The EPAct required that utility systems provide "open access" to their transmission assets. According to the Federal Energy Regulatory Commission this should "eliminate the transmission market power of public utilities by ensuring that all participants in wholesale power markets will have nondiscriminatory open access to the transmission systems of public utilities" [11]. These rules have effectively opened the transmission market to freer competition.

The second area which was addressed was the area of wholesale generation. A new class of players in the utility market was created. The code refers to this new class as "Exempt Wholesale Generators" (EWG). An EWG is defined as "any person determined by the Federal Energy Regulatory Commission to be engaged directly, or indirectly ... exclusively in the business of owning or operating ... all or part of one or more eligible facilities and selling electric energy at wholesale" [2].

Although EWGs have received less attention in the media, they potentially will have more effect on the marketplace. The key point is that Exempt Wholesale Generators "shall not be considered an electric utility company" [2]. Effectively, this allows anyone to own or operate a generating facility and offer the power for sale to any buyer, free from state or federal regulation. In addition, holding companies which are regulated under PUHCA are not prohibited from owning or operating an EWG.

One viable scenario is that a new company comes into an area and builds or buys a generating facility, selling the power to wholesale customers. Another, more refined scenario is that an existing public utility owns and operates a facility in a competitor's territory, thus directly competing in the generation market.

A speed bump was placed in the act in that no EWG can enter into a contract with an affiliated or associate company for the purchase of power unless such sale is blessed by all state commissions having jurisdiction. This effectively prevents existing utilities from unbundling generation assets and entering into full fledged wholesale competition. The result is a less competitive marketplace.

The final area dealt with under the Energy Policy Act of 1992 concerned registered holding companies and their involvement in foreign utilities. Although such involvement does not directly affect customers in the U.S., it does affect the financial stability and overall shape of the utility market, so it is germane.

Under the amendments to PUHCA, registered holding companies may own or invest in foreign utilities. However, the key point is that holding companies may pursue these activities without approval of the SEC. This is a radical departure from previous requirements.

One requirement is that public utilities cannot "pledge or encumber" any utility assets to finance purchase or operation of foreign utilities. This has caused many companies to use different financing techniques for foreign utility transactions, including divesting of previously profitable divisions or operations.

Re-regulation on the national level has just begun. Groups comprised of public utilities, large industrial customers, environmental groups and state commissioners are all trying to sway the imminent regulations to favor their interests.

In fact, the SEC has proposed to Congress three legislative options: limited repeal of PUHCA dependent on proper state oversight, unconditional repeal of PUHCA, or granting the SEC broader authority to exempt holding companies which voluntarily or through legislation have effective state regulation [4].

State Changes

To date, at least forty-five states are addressing changes to retail electric service regulations. Although a comprehensive review of each state's

models is beyond the scope of this article, a few key issues will be examined.

There appear to be two trends that have arisen out of most state's models. The first is a move towards keeping regulatory control of the transmission and/or distribution systems. Although there would be regulatory control, specific regulations could be significantly different.

Most states propose an Independent System Operator (ISO) based system. California, New England, and Texas, have already implemented this approach. Although specific responsibilities vary from state to state, the California Assembly states that the ISO is "charged with ensuring the efficient use and reliable operation of the transmission system" [12].

In the purest model, the ISO would gain operational control of an electric system's transmission network. The ISO would ensure open access, proper distribution of tariffs, resolution of congestion issues, and insurance of continued reliability. The obvious difficulty that arises is that a government chartered ISO has no financial motivation to develop unique and more efficient methods of control and operation.

Many states are also moving to charter a state controlled power exchange. The power exchange would provide, again in the words of the California Legislature, "an efficient, competitive auction to meet electricity loads of exchange customers, open on a nondiscriminatory basis to all electricity providers" [12].

Although some type of power exchange will be necessary in a market driven industry, it is not necessary that it be government run. The NYSE, AMEX, and Chicago Mercantile markets are all examples of private consortiums that provide free and open access to exchange of goods and services. In fact, commodities trading has already begun on future power contracts along the California-Oregon tie. Given freedom to act economically, competitive markets will form their own arenas for exchange.

The second trend is one towards near unfettered competition in the generation market. This follows logically along the lines of the Exempt Wholesale Generators created in the national arena. Most states recognize that the most efficient mix of assets will come from freeing up generation companies to make decisions based on market factors, not government regulations.

While most states have similar visions of the future structure of the electric industry, implementation and specifically timetables differ dramatically. California and several New England States have already passed legislation requiring implementation of restructuring by January 1, 1998. These areas have electric costs about twice as high as some other states [13]. Other states have set 2002 as the target.

Several large states, including Texas and New York, have required utility companies to submit restructuring plans. Most states have begun studies into the subject. Five states have not even begun to investigate restructuring because of acceptable costs.

Future

Generation Models

Although there is general consensus that generators must be allowed freer access to the marketplace, there are several approaches that are proposed. The first involves "Direct Access" by the customers to the generation companies. In this model, individual customers or groups of customers would negotiate bilaterally with the power providers for energy contracts. Some customers may even choose to have contracts with more than one supplier, to cover themselves in case one generator cannot meet their obligations. Fig. 3 depicts this arrangement graphically.

The second model is commonly referred to as the "Pool" model, as shown in Fig. 4. Power companies bid into a power pool based on the margin. In other words, what is the bid cost for the next marginal increase in load. The ISO (or similar entity) would then economically dispatch the units accordingly. Each successful provider receives compensation based on the highest marginal cost dispatched, regardless of their bid.

The pool model is based on the British power system. In Britain, each generation company bids into the pool, and the distribution companies se-

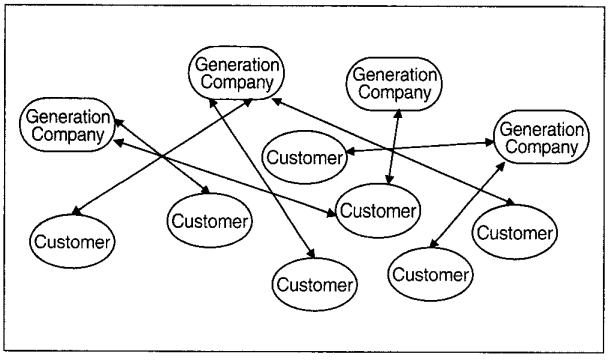

Fig. 3. Direct access model.

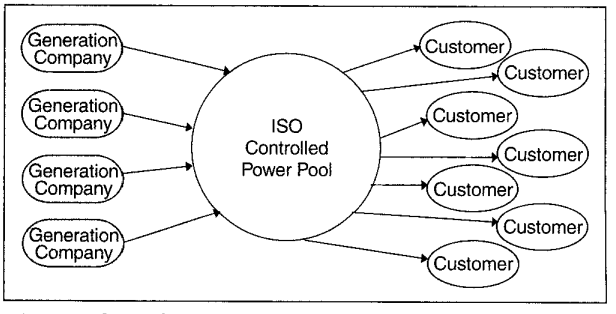

Fig. 4. Pool model.

lect their suppliers based on the marginal cost. Transmission is provided by a government held "backbone." This is the system left after privatization of the British electric system earlier this decade.

Fig. 5 depicts graphically the proposed price structure under a Pool type system. Each generating company bids their generating capacity into the pool at their expected cost. As system load increases, the price per kilowatt hour of electricity increases. Although the more efficient units are bid into the pool at a lower price, generating companies are paid for each kilowatt hour based on the highest priced unit that is being dispatched. This could lead to strategic holding back of a unit for a higher margin.

One popular approach is a conglomeration of the direct access and pool models, or hybrid model (see Fig. 6). In a hybrid model, generation companies are allowed to enter into contracts with any qualified customer, as in the bilateral model. In addition, a spot market pool is available for those who do not choose to enter into long term contracts. This is very similar to the natural gas system in place today. These contracts can be individual or traded on a commodities exchange. The hybrid model provides the most impetus for a responsive, viable market [14]-[16].

Oil For Electricity

What's next? There is at least one fascinating alternative electrical proposal on the table in Oklahoma. This creative proposal closely relates to a practice in the oil production industry. When oil and gas are produced from a well, the land owner receives a royalty payment. The producer obtains profit from the remainder after expenses are paid.

To encourage as much production as possible, there is a key clause in the agreements. The producer can use oil and gas on the lease for production purposes without paying a royalty. In essence, the producer has free fuel. The producer can even use the fuel to make electricity for operation of the equipment.

This new twist cuts one step from the process. A proposal has been submitted to the Oklahoma Corporation Commission (OCC) to allow the direct exchange of the equivalent oil or gas for electricity. This would eliminate the need for on-site investment in generation equipment. At the same time, it would bypass some of the operating costs and taxes.

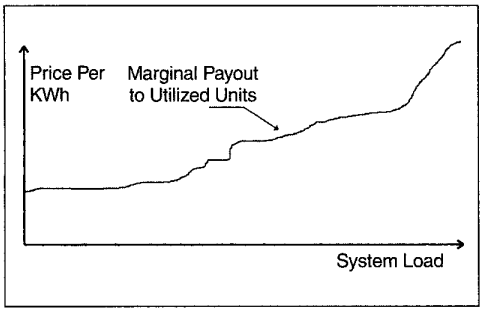

Fig. 5. Pool model pricing.

One of the more significant aspects of this proposal is that, in theory, it would allow the production company and the utility company to agree on an exchange rate, independent of any regulatory agency. Taken to its logical conclusion, this would allow the oil industry to gain a foothold in the competitive electric industry before other customers are allowed access.

This concept has gained even more significance recently. One of the largest gas pipeline companies in Oklahoma is based in Tulsa and is owned by a large oil company. Until very recently, this pipeline company was part of a utility holding company, which also owns one of the two large investor owned utilities in the state. Until the pipeline company was sold, it was the sole and only supplier of natural gas to the utility's power plants. Since the holding company is an interstate holding company, it falls not only under the regulation of the Oklahoma Corporation Commission, but also under the federal control of PUHCA. This restricted them from using innovative relationships between sister companies.

Since the pipeline company has now been sold, two new players are in the game of "Oil for Electricity." The new regulations will allow the investor-owned utility to purchase fuel from, and make agreements with, other suppliers. It will also allow the pipeline company to competitively bid for agreements with other utilities, as well as its former sister.

The OCC has approved the oil for electricity idea in principle. The most fascinating point is that the OCC is the regulatory body for the electric utility industry as well as the petroleum industry. This opens many options for creative production of electricity with very competitive fuel arrangements, as well as effectively reducing the users cost of electricity for gas and oil production and transportation to almost nothing.

Industry Model

Using the long term experience of the petroleum industry and the adjustments it has made over the years, a reasonable model can be developed for a vibrant, competitive electricity industry.

1. Develop an industry consortium of professionals, not paid representatives or government bureaucrats, to establish standards as needed.
2. Multiple producers of electricity will sell product to transporters.
3. Multiple transporters may purchase from producers.
4. One or a few marketers will distribute to the customers.

5. Government regulation will be minimized to taxation where it can be politically accomplished.

The transition from a regulated to free market place creates a few problems. However, these are comparatively minor in relation to the tremendous benefits. It is unnecessary to have regulators make the decisions other than to ensure there is no monopoly. Interestingly, that is just the opposite of present regulations. The marketplace will resolve the conflicts.

1. First, segment the vertically integrated companies into separate suppliers, transporters, and marketers. In time, some companies may again become vertical.

2. During a transition time of perhaps three to five years, establish minimum and maximum prices a transporter can pay for electricity in a particular market. In time, the market will resolve this pricing. Long term oversight is unnecessary since the time value of investment money is substantially reduced past three years.

3. Encourage any transporter to purchase electricity from any supplier and sell to any marketer. Very large customers may develop their own contracts using the transporter's tariff.

4. Distribution will be by one or a few local companies. Overall pricing and quality will generally cause even most large customers to stay with the local distributor.

There are two counterpoints of concern about the present electric utilities that must be addressed.

First, the existing companies have a large investment in the rate base, specifically in the area of existing generation stations. These plants were constructed under obligation to the regulatory bodies. The investments were deemed necessary and prudent under the regulated environment. Nevertheless, potential earnings on the plants were limited to the approved rate of return at the time.

There must be some recovery for these investments allowed. It is not prudent to burden corporations with investments made under a different set of rules, when they have not been allowed to receive market return during the previous life of the investment. In addition, utilities must shift the accounting structure from a single year system, to a long term return on investment system. This will be a natural outgrowth of removing regulatory constraints.

Second, the existing companies have an advantage because they are already in place. That is true on the distribution end. However, in the other segments, competition will quickly balance out any initial advantages. If nothing else, other aggressive companies will want part of the market. Opportunity does wonders for pricing competitiveness.

Any regulation that is implemented must be done at the state level. The needs and customers are very different in each region. The state agencies respond quicker to market demands than a federal agency. There is also the vested interest of promoting local economy rather than trying to develop a national consensus.

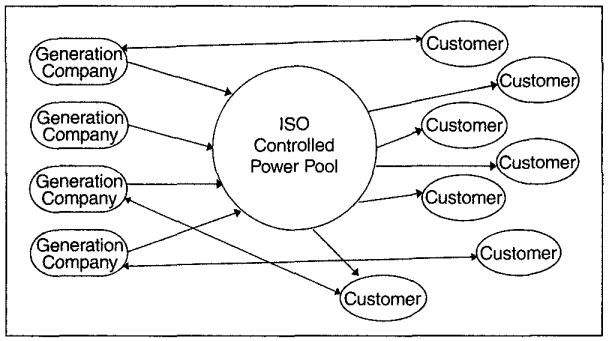

Fig. 6. Hybrid model.

How These Changes Will Affect Us As Customers

In the enthusiasm to change the regulations on the electric industry, the reality of overall economics is sometimes forgotten. Much of the push comes from industrial users. The same engineers that want to reduce the cost of energy on the job, pay for energy at home.

No company, including electric utilities, can viably stay in business without a profitable return on investment. When rates or profit are cut in one area, the return will be made up in another area. If some large industrials develop a method to reduce electrical costs, the logical progression is that other industrial, commercial, and residential users will pay more. The caveat is that as competition takes full force, over time costs will be reduced to the utility, and rates can come back to what is expected.

One concern has been that only high cost consumers will remain on the existing distribution system. If the utility company has restructured to three separate entities, this should be only a short term problem. The distribution company will now be in competition with the industrial for use of the transmissions services. At the same time the distribution will be a potential supplier to the industrial. The combination should drive the overall cost of the distribution company.

Residential wheeling involves the use of distribution lines. Direct access retail competition creates a substantial set of problems. The major difficulty is that only one distribution power system is in place.

Two scenarios are possible. First, the distribution company could be forced into wheeling. If true unit pricing is used, the net effect is zero. This is not reality as noted below. Second, an alternative distribution system would be built. Unless a substantial new technology is available, it is unlikely the cost would support a duplication of lines. At this time, retail wheeling appears to benefit the

large industrial customers, at the expense of the residential market.

What Happens To Costs

Until stability is reached, there will be an upward movement in prices. Since there are more individual entities in the supply chain, each will cause an increase. There are at least three reasons.

First, each organization will establish a margin. This is greater than the margin required by only one company. Second, each organization will add a new level of inefficiency. This may be offset by less need to respond to the inertia of a mega-corporation. Third, without regulation, there will be greater risk for investors. Greater risk demands greater returns.

The trade-off will be more options. The long term benefit will be a more competitive market which will ultimately drive prices significantly downward. Another major benefit will be the new technologies that will result from the competition striving for a competitive edge.

The final picture will likely be somewhere between the telephone system and the natural gas market. At present there are more options for transmitting communications than power. However, at the time of the break-up of the regulated telephone monopoly there were limited options there also.

Until there are more distribution alternatives, the connection to the customer will necessarily remain with a local transporter. There may well be numerous options for contracts like long distance phone service. However, that does not appear pragmatic at this time. Nevertheless, in many states, such as Texas, there is legislation under study to deregulate even the local phone system. It is generally expected that the existing phone, or cable, company will provide the wire service, with other companies providing the operator and billing services.

Conclusions

The deregulation or re-regulation of the electric utility is rapidly coming to pass. Historically, regulators created a monopoly that stymied creativity, technology, and economic viability. A new, competitive electric utility industry can be expected to eventually provide greater service, at a lower cost. Any new regulations which are proposed must deal both with compensating existing utilities for decisions made under the old system, and with allowing organizations to make new decisions which will benefit both them and the customer.

The new system will have three separate entities: supply or generation, transportation or transmission, and marketing or distribution. A technology manager or independent system operator may manage the system. However, the transporter can effectively carry out this role by dealing in industry accepted standards and bilateral contracts.

A set of widely accepted standards for both technological and economic issues must be developed. These are more effectively created using a consortia of industry professionals rather than a paid staff. If future regulatory involvement is preserved, it must be at the state level rather than federal.

A cost based pricing for the three entities, transporter, supplier and marketing, will encourage their efficiency, reduce their overall cost, and will maintain their economic viability. This will encourage large customers to remain in all segments of the industry, and maintain the viability of the entire industry.

The key conclusion is that a competitive electric utility industry will benefit all parties involved. However, care must be taken to ensure that no substantial burdens are placed on the industry by ill-crafted legislation.

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