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Electric Utilities and the NII - Issues and Opportunities

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Electric Utilities and the NII--Issues and Opportunities

The electric utility industry is immersed in a changing environment and deregulation is a key pressure driving this change. Careful strategic planning for what their future business will be is called for and there are concerns for the basis on which they will be competitive. Embedded in this restructuring evolution and coupled to the growing need to provide more in supply-side and demand-side management is the opportunity for the electric utility industry to become a significant player in the deployment of the National Information Infrastructure (NII). A recent EPRI study concluded that

> "Energy production and delivery will be tightly coupled with telecommunications and information services for the foreseeable future. In order to control access to the customer and prevent erosion of their customer bases, utilities will be driven to become more aggressive in deploying both supply-side information technologies for improved operation of their generation, transmission, and distribution facilities; and demand side Energy Information Services (EIS). Those information services will enable utilities to provide higher quality services at lower cost with lower environmental impact, and to give their rate payers better control over their power usage."[1]

The entry of the electric utility industry into the telecommunications arena, which is driven by the need to provide energy information services for the generation, delivery and utilization of electric power, can impact competition in this market and can contribute to the goal of universal service. However, there are significant policy implications which must be addressed.

An Industry in Transition

Following a couple of decades during which competition was increasing in the energy market, the Energy Act of 1992 provided legislative authority to the Federal Energy Regulatory Commission (FERC) to mandate open wholesale transmission access. As a result there is an even greater imperative for the electric utility industry to reexamine its business strategy to determine how to remain competitive as this historically vertically integrated monopoly becomes restructured into focused organizations that will compete in the energy supply and delivery marketplace. The overall issue is how to provide quality energy in a cost effective manner while reducing the need for the capital investment of new generating capacity, reducing the depletion of non-renewable fuels and reducing emissions. Coupled with these elements is the recognition of the need to focus on customer service and satisfaction. On an individual utility basis, the issue is deciding what part of the market to focus on, how to maintain and build the appropriate customer base and how to maintain and increase their present market share. The utility choice of business lines includes generation, transmission, distribution, and valued added services and these businesses might or might not be segregated into separate subsidiaries.

In a strongly regulated environment, there is little incentive for industry to be innovative--there's a vested interest in today's technology. The prevailing philosophy is that it's okay to be Number Two, there's no need to lead the pack. However, the competitive, non-regulated marketplace encourages innovation and industries adopt strategies to manage rather than avoid risks in the deployment of new technologies. The electric utility industry is moving toward the latter and as such will be forced to consider the opportunities offered via telecommunications and information services to a much greater extent than has occurred to date. As will be discussed later, this is fortuitous for the deployment of the NII and the vision that it is possible to create and information infrastructure and the tools to support smart energy decisions by all consumers and lessen the U. S. balance of payments and dependence on foreign energy sources.

Many electric utilities have extensive telecommunications facilities that they use for conducting their business--maintenance and operation of their generation and distribution systems to ensure reliability and quality of service to their customer base. Some utilities, however, rely on services provided by telecommunications providers.

Important assets utilities bring to the table that could be utilized in providing telecommunications services for themselves or others include extensive rights of ways extending to businesses and residences, a ubiquitous presence in residential and business locations, and extensive system facilities (as conduits, poles, transmission towers and substation sites) that could be used in telecommunications networks.

The FERC recently announced a Notice of Proposed Rulemaking (NOPR) that outlines the mandate for the electric utilities open their transmission facilities to all wholesale buyers and sellers of electric energy.[3] Included in the NOPR is a notice (RM95-9-00) of a technical conference on "real time information networks" (RINs) that would give all transmission users simultaneous access to the same information under industry-wide standards. Thus it is clear that within a relatively short time frame, the need for this information system and telecommunications service will directly affect the 137 utilities that will be required to open up their transmission facilities.

__The Electric Utility Organizationally:__ There are three main categories of utility today--investor-owned utilities (IOUs), the municipal utility and the rural cooperative. A fourth, often-discussed utility is the registered holding company (RHC) is a sub category with the investor-owned utilities. These are the multistate investor-owned holding companies required to be registered with the U. S. Securities & Exchange Commission (SEC) under the Public Utility Holding Company Act (PUCHA).

When the electric utility industry was born late in the nineteenth century it appeared first in the form of IOUs with the corresponding corporate charters shaping its existence. As electric service spread and became viewed as a necessity rather than luxury, discontent grew with the selective nature of the coverage provided by the IOUs. By 1900 many cities and some counties had created a municipal utility as a unit of the local government with the charter to provide service to all its constituency. Financing was primarily through tax proceeds and future system revenues. Later during the New Deal, the rural cooperative was born as a customer-owned, not-for-profit membership corporation. This progression of organizations was driven by requirements of customers and to some extent industry strategic objectives. This progression continues today, albeit in a somewhat different form.

About 95 percent of the US population is served by the electric utilities.[3] Of these customers, 76.4% are served by IOUs, 13.7% by municipal utilities and the remaining 9.9% by rural cooperatives.[4] Few have the opportunity of choice in their supplier of electricity--in most cases it has to be the local provider. However, the possibility for options in choosing a provider offered through what is referred to as "retail wheeling" could make more competitive choices available.[5]

<u>Utility Authority with respect to Telecommunications:</u> Each utility organizational type functions differently within regulatory environments that vary according to jurisdictional boundaries. As discussed extensively in a recent report examining these issues, all have legal authority with respect to telecommunications to build infrastructure and to deliver at least some telecommunications-based services related to the delivery and consumption of energy.[6] It is legally sound, though possibly contentious, for a utility to build the facilities needed to communicate with its customers and possible suppliers and to develop the information services they need for effective energy management. However, the reaction of regulators and competitors could be negative should the utility attempt to exploit the excess capacity created by the deployment of this infrastructure. The utility has at least three strong arguments to counter any challenges and support their position.

> "First, since utilities have clear rights to bring such facilities and enterprises into being, they have considerable leverage with regulators and competitors alike

to achieve new arrangements that acknowledge the utilities' rights and interests and build upon them.

"Second, since utilities have undeniable rights to read their own electric meters through telecommunications pursuant to their existing authorities, they may also have First Amendment Protections...to send any information they wish over their wires...

"Finally, the nation's need to finance construction of the NII and make it universal gives electric utilities a compelling reason to gain regulatory favor for the use of and profit from their excess telecommunications capabilities."[6]

Of these arguments, the final is most compelling since it provides leverage that can further the goal of universal access for the NII, especially in rural areas with its low density customer base where the cable industry and telecommunications providers are less likely to provide the necessary infrastructure.

Benefits of Energy Information Services: There are several characteristics of energy supply, distribution and consumption that can be exploited to realize efficiencies and energy savings and, while they have been to some extent, the use of telecommunications-based information services offers the potential to enhance these substantially. From the industry's perspective there are many benefits to be accrued from the application of both supply and demand side information services. From a supply side, real time information permits a shift to less conservative operations. Smoothing of peak power loads is possible and spinning reserves can be reduced. Increased information can lead to reduced theft of energy. Load balancing between utilities is feasible. Meters can be read remotely and remote control of service is possible. Most importantly, there can be a more efficient use of power and a reduced need for new generating facilities.

For example, linking electronic sensors and automated control systems along transmission and distribution lines offer the possibility for applications such as the optimization and brokerage of dispatch and emissions credits, automatic meter reading, and remote service control. Similar deployment could be made in commercial building with transmission to the utility of detailed information on end-use energy consumption along with temperature and other relevant measurements. The analyses of such data could produce results which could be applied to improve utility load forecasting, improve building energy models, improve analysis of building energy efficiency and diagnosis of building electrical systems' problems.

Energy consumption varies according to consumer as well as the time of day. Residential, commercial and industrial sectors have differing requirements. The use of real-time pricing (RTP) which provides a direct relationship between the cost of electricity and its demand can provide an incentive to encourage customers to conserve power when demand, and hence cost, is highest. This choice provides the customer a reasonable amount of discretionary control. The use of direct load management involves direct utility control of customer appliances to reduce consumption during peak demand periods. Target appliances include those used for electrical heating, air conditioning and hot water heating. The demand side management approach with the most stringent time response requirements is rapidly curtailable loads (RCL). Load must be shed within 20 seconds or less. Only large commercial/industrial customers currently have interruptable power tariffs. Customer applications are generally referred to as demand side management (DSM). A more comprehensive term, Energy Information Services (EIS) is used when DSM is coupled remotely-provided information services.

Although each of these approaches, as well as others, are currently being used, the benefits derived can be increased with the increased application of the evolving information and telecommunications technologies.

Issues and Approaches

The pressures of increased competition and rapidly evolving technology converge with sufficient force to mandate that utilities develop robust business strategies. There are also compelling arguments to justify the consideration of public policy issues related to the involvement of the electric utility in an effective deployment of NII. Those arguments are tied to economics, to technology and to regulatory issues. Utilities, legislators and the public are struggling with the notion that utilities could provide the "last mile" energy service capability as well as the more general NII access to the consumer, either competitively or in concert with the cable and telecommunications services sectors. Should the electric utilities provide the last mile access to support their energy services requirements, it is estimated that about 5% of the fiber optic network capacity would be needed to satisfy that requirement. The excess capacity could be leased or sold to other information service providers, subject of course to appropriate regulatory provisions. All these elements are important to the vision for the NII wherein deployment is accomplished economically, equitably in open, competitive marketplace and with universal service assured.

<u>Economic Issues:</u> Since electricity is fundamental in some way to every product and every service in the U. S., it is not unexpected that the cost of electricity should have an economic impact. Consistent decreases in real electric power costs during the 1950 and 1960 decades was a factor in economic growth. The following decade saw a reversal in that trend with real prices for electric power increasing. Energy information services offer the means to help reduce total energy costs. Summarizing the benefits discussed above, total energy costs can be reduced through 1) improved operating efficiency, safety and productivity of electric utilities; 2) optimized power consumption, reduced energy costs, and improved energy efficiency for customers; 3) deferral of capital investments in new generation, transmission and distribution facilities and minimization of environmental impacts. In addition to these, there are at least two other significant effects with positive economic implications: 1) the creation of new energy-related businesses and jobs and 2) new growth opportunities for utilities as well as for other sectors of the economy. Finally, telecommunications facilities and services provided by the electric utility that did not exist

before would be available to support the emerging information infrastructure. These benefits can be illustrated quantitatively by economic research analyses, by proposed utility projects and their projections and by utility projects in operation.

In a plan filed by Entergy, *Least Cost Integrated Resource Plan--A Three Year Plan*, with several PUCs in their service area that utility proposed a Customer-Controlled Load Management (CCLM) project that would eventually serve over four hundred thousand customers. Their projections showed a cost/benefit ratio of 1.57. That is, the projected 20-year electricity benefits (or avoided energy supply costs) would be $1845 per household while the cost of deploying and maintaining broadband telecommunications infrastructure would be $1172 for each household.[7] The local regulators in the city of New Orleans, included in the plan, challenged Entergy on the basis of technical and regulatory uncertainties. The utilities' intentions for the use of and accounting for the excess capacity were never clearly stated. Critics were concerned that the utility stockholders would exploit the windfall excess bandwidth for profitable, unregulated telecommunications. This concern must be dealt with.

There are also indirect economic benefits of the electric utility contributions to information infrastructure and services deployment. Several recent studies have considered and quantified the ties between telecommunications and competitiveness. A selection is highlighted here.

- By instituting policy reforms to stimulate infrastructure investments in broadband networks, an addition of $321 billion in GNP growth would be possible over a 16 year period beginning in 1992.[8]
- Jobs can be created through investments in telecommunications infrastructure. Should California increase it telecommunications infrastructure investment by $500 million to $2.3 Billion per year over an 18 year period, such investments would produce 161,000 jobs, $9.9 billion in additional personal income and $1.2 billion in additional state and local tax revenues.[9]

- Productivity is enhanced through access to telecommunications infrastructure. Since 1963, it has been calculated that telecommunications have saved the 1991 U. S. economy $102.9 billion in labor and capital expenditures.[10]
- Export activities are also supported by telecommunications infrastructure investments. One study demonstrated that between 1977 and 1982, increased competitiveness induced by improvements in telecommunications infrastructure led to an increase of U. S. exports of over $50 billion.[11]

A recent study conducted by DRI/McGraw Hill under conservative assumptions and determined that the deployment of energy information services and the full use of the telecommunications infrastructure supporting those services could make a significant contribution to the U. S. economy. Specifically, it would

- "Improve U. S. productivity by reducing total real energy costs by $78 billion between 1995 and 2010;
- Increase national employment by an average of 63,000 jobs per year;
- Produce a cumulative $276 billion increase in GNP between 1995 and 2010;
- Achieve a cumulative increase of $25 billion in U. S. exports because of improvement in business productivity;
- Reduce the federal deficit by 2010 by a cumulative $127 billion; and
- Increase real personal income by a total of 173 billion, or $280 per household, through both energy cost savings and improved economic activity."[12]

As noted earlier, most utilities have telecommunications infrastructure that they use for their internal business conduct. Some have begun to develop and test energy information services. Few, however, have entered into providing telephone or cable TV services. An exception is the municipally-owned electric utility. In 1988, the Glasgow Electric Power Board installed a broadband network designed to support the usual communications need of the utility, to provide innovative new energy information services and to offer cable TV services in a community of population 13,000. The program has been very successful. An interesting observation made by this utility is that while customers might not be interested in having his water heater controlled to gain a credit of $3-$4 a month on his electric bill, he may well be interested in having his water heater controlled in exchange for reception of a premium channel such as HBO. This observation offers support for the concept of having a single gateway into the home for all information services in that the customers perception of value is just as important as the real value.[13]

This competition in cable TV in Glasgow has reduced prices. Prior to the broadband network installation, the local cable provider, TeleScripps, offered standard service in the area for $18.50. After the utility offered its service at $13.50, TeleScripps immediately dropped its rate to $5.95 and increased the basic service from 21 to 48 channels. Despite this aggressive competition, the utility has reached a market share of about 50%. A more significant point, however, is that the local citizens in Glasgow have reduced their cable TV bill and that savings has stayed in the local economy supporting local development.[13]

Statistics are not available on the energy savings results since at this point those have been limited. Glasgow purchases all its electricity from TVA and at the time the network was installed TVA did not offer a time-differentiated wholesale rate structure. It was not possible to pass the cost savings from load shift to customers. However, when wholesale wheeling becomes available, Glasgow is clearly positioned to use that to its advantage.

<u>Recent Strategic Alliances:</u> In recent months there have been a number of alliances announced which are aimed in some way of teaming players in the areas of energy services with those who provide telecommunications services and develop sensors. Retail competition for large customers is likely in the near future in much the same vein as many large facilities today that have more than one major telecommunication service provider selected for the best possible price and for ensuring reliability. The timeline for

extending retail choice to residences and other industrial and commercial sectors is less certain except for isolated pockets that demonstrate certain advanced technology applications. In any case, it is clear that the alliances mentioned below, as well as others are moving in anticipation of this eventuality by virtue of changes in their business and technical models.

In January, AT&T announced the formation of a multi-company team "to develop and deliver a cost-effective, fully integrated, two-way customer communications system for the utility industry."[14] Its development partner in this activity is Public Service Electric & Gas (PSG&E). Members of the team are American Meter Company, Anderson Consulting, General Electric, Honeywell and Intellon. The short term objective is to provide remote meter reading, power outage detection, real-time load management and warning of meter-tampering. Long-term objective will focus more on increasing customer control of their energy use. A notable observation about this alliance is that the utility has managed to share the risks.[14] Although AT&T is heading the project, the niche expertise of several other companies key to the success.

In mid-April, TECO Energy and IBM announced a pilot agreement "to demonstrate and evaluate as advanced smart home energy management and communications system that will enable residential electric utility customers to better control and track their energy consumption, right down to their appliances."[14] In addition, the system can serve as a gateway to the home for a variety of communications by serving as the interface for providers of voice, video and data services--it can be the access point for the emerging information infrastructure. The system is configured to connect energy measuring and monitoring devices to a personal computer in the home and to a control processor attached outside the home. This processor acts as a central controller for a local area network via the existing in-house electrical wiring. With this configuration, residential customers can measure their energy use and costs twenty-four hours a day and utilities can administer new, more effective energy management programs.

Also in January, CableUCS was announced as a consortium of four of the nation's top cable operators--Comcast Corporation. Continental Cablevision. Cox Communications and Tele-Communications Inc. CableUCS was formed to foster, build and manage strategic relationships between cable operators and utilities--gas and water, as well as electric--and to promote the development of equipment and systems that will utilize the two-way telecommunications capabilities being deployed by the cable companies.[15]

Other notable strategic alliances are 1)Entergy with First Pacific Networks, 2) SoCal Edison with Cox Cable, and PG&E with Microsoft and TCI. In addition to the energy services mentioned specifically above, others addressed by these alliances include energy theft detection, customer surveys, real-time pricing, power quality monitoring and distribution system automation.

<u>Factors Influencing Strategic Alliances</u>: As discussed above, the electric utilities have a choice--deploy and operate their own telecommunications infrastructure or use infrastructure provided by other telecommunications service providers. A recent study by Anderson Consulting stated that "In most cases, the benefits and risks of using a third-party provider's network outweigh the benefits and risks of a utility owning and operating its own network."[16] This is especially true with respect to the utilities Supervisory Control and Data Acquisition (SCADA) which requires real time and high reliability.

Although most of the management of the electric grid is through use of the utilities' own telecommunications infrastructure, there are some experimental projects that utilize cable, wireless and other services for providing "last mile" access for energy services management. Possible synergism between the utilities and the cable and telecommunications providers could be exploited such that the utilities could take advantage of the last mile infrastructure already in place to address the energy application currently deployed. However, the future will require enhanced capabilities as noted by Anderson Consulting study.

"For the present, narrowband alternatives such as radio-based infrastructures are adequate to deliver many of the communications-enabled services being considered. Nevertheless, trends in other industries are moving toward customer interfaces through televisions and personal computer; these interfaces will require broadband."[16]

In order to use existing cable infrastructure for two-way communication, the cable providers will be required to retrofit their infrastructure to handle high bandwidth two-way interactive traffic. In addition, since most of their current infrastructure is residential, they will have to partner with other providers or extend their reach to the business and industrial sectors. The cable companies reach about 62% of residences."[17] The local telecommunications providers, local exchange carriers or regional Bell Operating Companies (RBOCs), have a much larger footprint with respect to residential customer base, 94%--one percentage point less that the electric utilities."[3] However, even though the telecommunications industry has made strides in the amount of information provided over conventional twisted pair lines, a more economical approach for the utilities is probably providing fiber directly to their customers. This could be funded by the sale of excess capacity as mentioned above or through energy savings earned through energy management services by the utility or the customer.

Technologies: The current technologies for energy information services are quite diverse. They range from proprietary SCADA and energy services protocols to systems based on open protocols such as Open Systems Interconnect (OSI) and the Transmission Control Protocol/Internet Protocol (TCP/IP) protocols.

Most residential solutions rely on the X10 protocol, implemented with simple command controls using frequency modulated power line carrier communications. CEBus, a protocol proposed by the Electrical Industry Association, and the LONWORKS protocols developed by a joint effort of the Echelon Corporation, Motorola and Toshiba are two new entries in the residential energy management arena.[18] These two solutions can be implemented over a variety of media, that includes twisted pair lines, infrared, fiber, coax, and radio frequency. Yet most of these solutions have significant drawbacks for addressing the requirements of a general local area network that is configured to support advanced information and energy appliances.

Advanced energy distribution and management systems are being tested with infrastructure deployed by utilities, through Internet services, and with infrastructure formed by combining the resources of existing utility, telecommunications, and cable providers. * There are also some instances of more advanced systems. PG&E is using the TCP/IP protocol suite for managing their energy distribution system. In addition, EPRI provides an energy information services network that is multiprotocol, using both OSI and TCP/IP based services such as WAIS and Mosaic.

In the future technical requirements will require compatibility with existing as well as emerging technologies such as Asynchronous Transfer Mode (ATM), multimedia, field data transfer, security, wireless quality of services/resource management, TCP/IP, and more. Trials are underway for enhanced monitoring and predictive maintenance of energy distribution and generation systems. This application requires a large number of addressable nodes with the capability for gathering and transmitting observation data to a centralized location for analysis. Access to such energy related information, including accounting and billing information will be required by users. Such access will be over both the Internet and any alternate route provided as part of the utility/user infrastructure for real-time energy demand management and control. To meet this requirement, utilities must operate a multiprotocol system and the end user will need an inexpensive multiprotocol gateway/interface/desk-top-box. Real time protocol support for such applications as time of day pricing or real time pricing and both multicast protocols and the infrastructure to handle the reverse aggregation of responses in real time. Scalable network management tools are also required to handle the plethora of devices employed to support both the energy related and information related infrastructure. These same tools must also allow for the end-to-end maintenance and operation of the energy system over the various media that may be used. Finally, secure mechanisms and protocols are need before any real energy related business will be conducted over an open packet switched network such as the Internet. Remote control of end-user appliances can only be done in a secure environment and users will likely demand reasonable control over the other data and information that passes through their information access gateway. Technologies are beginning to emerge that can handle these requirements so considerable growth in this area can be forecast.

A real need exists that is not being adequately addressed. A general purpose gateway and a control model implementation should be configure for the residence so that the consumer can control both their energy and information appliances from a single source—a PC or a unit attached to their television. In addition this concept should permit the user to control what data and information passes beyond the walls of their premises. To effect such a solution, the utilities must define the data and information exchange paradigm, that is Electronic Data Interchange (EDI) between the utility and the customer. The beginnings of this activity is the focus of part of the recent NOPR issued by FERC and discussed above.

The decision of utilities to adopt a narrow set of technical standards for the purposes of achieving interoperability or scale of economies may at first seem to be a sound choice. But over the long term this decision may put them at a disadvantage.** The NII and the Internet, as well as any energy system infrastructure will continue to be a heterogeneous mix of media and protocols. Hence, interoperability will be possible through the use of open access and standards for gateways and interfaces, not through an end to end homogeneity based on a single protocol.

Recommendations and Issues to be Resolved

The question could be asked, is there a compelling application for the NII that is serving as a driving force for a very rapid deployment? And are the applications that could be suggested as an answer to this question contributing to the competitiveness of the U. S.? Why not put more emphasis on providing energy information services since this is a ready NII application? Why not partner electric utilities with other service providers? There may not be sufficient revenues to deploy the NII without participation by the electric utilities.[12]

Technology Needs: In early 1994, the National Research Council was directed to examine the status of the High Performance Computing and Communications Initiative (HPCCI), the main vehicle for public research in information technologies. Two of the recommendations from the report of the committee that conducted that review are appropriate here.

> "Recommendation 7. Develop a research program to address the research challenges underlying our ability to build very large, reliable, high-performance, distributed information systems based on the existing HPCCI foundation."[19]

The three areas identified by the committee for where new emphasis is critical to supporting the research needs associated with the information infrastructure are "scalability, physical distribution and the problems it raises and innovative applications."

> "Recommendation 8. Ensure that research programs focusing on the National Challenges contribute to the development of information infrastructure technologies as well as to the development of new applications and paradigms."[19]

It is clear from the discussion of technologies that these recommendations are very relevant. For example, the development of an open non-proprietary premises gateway may prove to be the single most important advancement for both the energy services and the NII information services since it will enable new and innovative supporting hardware, software, system and services that will drive not only the energy supply and consumption applications arena but will also feed the further development of the NII.

The electric utilities will need to deploy telecommunications infrastructure to support the energy management services, but it should also provide generic NII and Internet access. The technologies involved must be amenable to interoperate with and utilize the services of the other service providers.

Appropriate security mechanisms are required for the delivery of adaptive energy services and for inter-utility, as well as utility to consumer business activities. An issue that needs to be addressed is the need for consumer privacy. Industry, commercial concerns and homeowners will all want to control who collects and has access to the information collected regarding their use of electricity.

Regulatory and Legislative Issues: Deregulation in progress or being considered in both the electric utility and the telecommunications arenas will affect how the utilities will or will not be involved in the NII. The 103rd Congress considered telecommunications reform legislation but failed to pass the proposed bills. The 104th Congress is likewise considering such reform. The question of how that should be structured should be framed with the ultimate interests of the public as the strongest driver. Is the "two-wire" model the appropriate scenario and is it a truly competitive model? Although it is agreed that everyone should be able to compete, the problem lies with the details of how and when that can be accomplished.

Another factor not often discussed is the cost of deploying the NII. If the cost for deploying to one residence is about $1000, deployment to 100 million homes would cost $100 billion--clearly not pocket change. The consequences of the two-wire model effectively doubles this cost. What markets will be there to recover such costs? Can the U. S. afford to spend twice as much as is needed?

There is general agreement between both political parties that the electric utilities should be allowed to enter the marketplace the same as any other "entity". As such the utilities could go head-to-head with the other service providers. But is this the best approach for all parties? The Anderson study referenced earlier[16] has a theme of dissuading the utilities from building the networks themselves--the two-way broadband communications that are projected to create benefits of $700 million/year. Instead, Anderson suggests that the electric utilities should partner with the cable TV companies and invest in upgrading the convention video networks. This may make sense if the utilities are to own equity in the resulting network. This would allow the utilities to finance the investment through rateable contributions since the justification is energy management applications.

The electric utilities, however, also have the opportunity to partner with the local telephone companies. These tempos are struggling under the burden of regulation that prevents them from entering two competitive information services--video and long distance. Should another entity, such as the electric utility, build and manage the infrastructure, the telcos would be in a more advantageous position for competition.

Regardless of how the legislation proceeds, the electric utilities should be positioning themselves for the future. The opinion of someone who has considerable experience in dealing with the telecommunications issues of what utilities should be doing today is the following:[20]

- "Start building 'common infrastructure'--switched broadband telecommunications networks that the utility will use itself to deliver energy information services to consumers.
- Work with regulators, where applicable, to assure they accept such facilities in the utilities' electric rate bases, premised on the utility's undertaking to deliver energy information services via its infrastructure to all its electric customers in a negotiated time-frame.

- Lease 'excess capacity' to cable operators, telephone companies; and others on a non-discriminatory basis--subject to regulatorily-sanctioned protections of incumbents to guarantee their continuity of service and recovery of investment.
- Voluntarily avoid competing with service providers to encourage amicable differentiation of market segments and to safeguard an open market in services."

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