

How to Drive Competition in a “Deregulated” Market

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By

**Fred L. Smith, Jr.
President, The Competitive Enterprise Institute¹**

Introduction

As the director of a public policy group active in the electricity restructuring debate, I'm pleased but a bit humble to be here today. Most of you are in this industry and, thus, know vastly more than I about the technical complexity of making the electrons run on time. My task is to review how the policies that restrict your ability to play that role have evolved and the changes that would be necessary to allow you to do your job even better.

This paper argues that America took a wrong turn during the Progressive Era over a century ago at the dawn of the electricity age. Progressives saw political (rather than private) management of many services as more likely to advance the public interest. That belief did not lead in general to nationalized industries but it did stop the promising evolution of a competitive electricity system. Instead, America moved to create a national system of highly regulated regional franchise monopolies.

As the progressive faith in the superiority of political management of the economy has faded, there has been a decided move to deregulate. Railroads, trucking, airlines, and

¹ CEI is an active public policy group focusing on regulations. For a review of our work, visit our web site (www.cei.org). View our electricity studies at www.cei.org/section/section11.cfm. These remarks arise from ongoing work by myself and Wayne Crews of the Cato Institute.

banking – all to varying degrees have been freed to operate in the competitive world. That deregulatory process is now underway in the electricity sector.

Current proposals, I argue, are flawed. Electricity like other network industries consists of two elements: the stuff that *flows* (the power) and the *grid* (the wires) that it flows over to the final customer. Coordinating the operating and investment policies of these interdependent elements may be far more complicated in vertically segmented systems. Both elements should be freed of government interference. That was the deregulation approach taken for railroads. In contrast, most electricity restructuring proposals (as well as those for telephone and airline networks) have focused almost solely on freeing up the generation (the flows) element, leaving unchanged the regulated status of the grid. This neglect is serious for several reasons: first, efficient design and management of the grid can reduce network costs appreciably (poor grid design can increase line losses, for example); second, many of the more important productivity improvements in the network require grid investments (high temperature superconductor segments, flexible AC transmission capability, surge/wave protectors); and, third, many productivity gains require coordinated investments by generator and grid, grid and final consumer or all three (interactive pricing of electricity services, for example, require investments by all).² Indeed, some reforms further regulate the grid, forcing it to become a common carrier (with the regulatory agency determining the “fair rate” for providing transmission services). Such partial deregulation is unlikely to prove viable; thus, our challenge is to find viable ways of freeing the grid as well as the flows.

My charge is to ask (and provide initial answers) to a number of questions:

- **Why is electricity so heavily regulated?**
- **What mistakes have been made in electricity deregulation to date?**
- **What is needed to move electricity again to the frontier of the American economy?**

And I’m to answer these questions for Texas which is a bit unique in its own right. Texas has sought – with some success – to maintain a rational energy policy. When other states were relying on demand side policies (energy use restrictions) to address future “needs,” Texas was building new power plants. Moreover, Texas has stayed aloof from the national energy wars, limiting its interconnects with the rest of the nation. Few interconnects link Texas to the national grid and those that do aren’t inter-connects! Wise. Some have seen Texas as providing a model, but, as Pat Wood is finding, he’s no longer in Texas and Texas is not the nation. Moreover, Texas could do much more to rationalize its system also.

² The deregulation of the rail industry as a vertically integrated system – both trains and tracks – has been very important in the post-deregulation productivity gains. Indeed, the rail systems demonstrate a point also made later in this paper: capacity is too often seen as an expansion of grid physical capacity. The freight rail systems of America have steadily increased flow *while actually shrinking track miles!* That gain would have been far more difficult had this network been broken up.

Why Is Electricity So Heavily Regulated?

The brief answer is that America's move into the electricity age coincided with America's Progressive Era. The progressives believed that markets – private action more generally – were inadequate to address the complex problems of a modern age. And they succeeded to a substantial degree in weakening America's long preference for private over public and state over federal action. Americans would still favor capitalism, but the progressives were effective in shifting from the economic liberal views that believed competition was the best means to discipline errant economic behavior to the view that wise, enlightened political regulations were needed. Their success owed much to the times. The Industrial Revolution was a chaotic period and, as the economist Joseph Schumpeter had warned, capitalism's dynamism, its *creative destruction*, would create many enemies of the market. Intellectuals, Schumpeter noted, would be envious of their entrepreneurial counterparts and desirous of better-paid governmental positions and would constitute a major force for expanded government intervention. This would be a major problem, he noted, because the intellectuals (the writers, reporters, novelists, teachers) are the intermediaries between the complex political world and the citizenry. Their attitudes toward the market will have significant influence and by the late 19th Century intellectuals were in full cry against free enterprise. They portrayed the Industrial Revolution as an era of Robber Baron exploitation of the "little man," preparing the political foundation for a significant expansion of government control over the economy.³

Politically active intellectuals found allies among the many local political interests who feared that the emergence of the national modern corporation would weaken their ability to extract rents (higher local taxes and local regulations) as indeed it would. Local businesses feared change for much the same reasons.⁴ After all, as Nobel Prize economist George Stigler noted long ago: Most businessmen view competition like exercise as *good for other people*. The result was the massive expansion of government control over industry at both the federal and state level.

In retrospect, the Progressive Era was probably inevitable. A rapidly changing economy is chaotic – winners today are losers tomorrow. Promising technologies falter; dinosaur sectors surge ahead. Often, it is hard to explain what is happening, to distinguish the wheat of real growth from the chaff of fraud and puffery. What we don't understand, we often fear. In particular, the emerging network industries (rail, electricity, telegraph, telephones) were very poorly understood. Progressives saw such large-scale vertically integrated industries as *natural monopolies*. Such industries, it was argued, were

³ The same forces were active in Europe. Here the result was the regulatory state; in Europe, the result was national ownership, a more direct form of socialism.

⁴ Note a similar attack is now underway for analogous reasons against the multi-national corporation. The goal here is to suppress the disciplining pressures on national governments created by this new global economic system.

characterized by declining marginal costs; only one firm could rationally serve a region. But that outcome, it was feared, would leave consumers hostage to that victorious firm. The story told by many was that America was moving from a world of small businesses – your friends, your neighbors – to a Robber Baron age of asymmetrical, exploitative exchanges between widows and orphans and plutocrats.

In fact, there is little “natural” about the monopoly status of network industries. In 1887, six electric companies organized in New York City alone. By 1907, Chicago had over 45 firms competing. Indeed, as late as the 1930s, Cleveland and Columbus were served by competing electric companies.⁵ Nonetheless, Samuel Insull, a business ally of the progressives, who headed the Chicago Edison Company, persuaded America that “acute competition” would be disastrous, that geographic monopolies were necessary. And he succeeded.

Nonetheless, the Progressives were sure that political oversight and control were essential to protect the “public interest.” Their success illustrates a general rule -- empirical evidence rarely trumps a good theory. As a result, regulators gained political control over the infant electricity systems of America. State utility commissions would award some firm a regional monopoly franchise to generate, transmit and distribute electricity (the end of competition) in return for its control over rates, investments and so forth. Telephones and natural gas were regulated in a similar fashion as they emerged.

Note that one network industry, the railroads, were treated somewhat differently. Railroads had been the first major network industry and had developed decades before the Progressive Era. As a result, competing rail grids criss-crossed America. Few regions of any economic significance were served by only one railroad. As a result, while the railroad industry was regulated, no move was made to create regional monopoly franchises. In contrast, the newer network industries – electricity, telephones, and later natural gas – were infant industries. There were few dominant firms and even fewer in competition with each other. It was therefore feasible to impose “order” and create a single provider in most areas of the nation.⁶ The result as discussed later was that deregulation took a much more rational path in the rail than in these other network sectors.

Some highlights of the subsequent history:

The REA: The regulated electricity systems of America soon wired much of America. It became increasingly obvious to everyone that electrification was valuable and investment in distribution soared. However, stringing wires was costly and rural regions were slow to gain access to the emerging grids. Markets responded by developing (what we would now call) distributed generation capacity – generators, small head dams, windmills. The patent record of the

⁵ James A. Damask, “A Powerful Myth,” Paper of the Buckeye Institute, Ohio.

⁶ A few isolated cases where wires compete with one another in urban areas still exists. These were discussed in a Reason magazine article some years ago.

period shows a flowering of innovations in these areas.⁷ But markets introduce high-cost services only slowly and the progressives were impatient. The Rural Electrification Administration was created to provide rural Americans electricity – regardless of the costs. The creation of the REA suppressed the most promising evolution of this distributed generation capability. Had we not elected to subsidize rural power, America would now have a rich repertory of technological options that would be very valuable to the developing world. Instead, all America can offer these poorer nations is an expensive governmental subsidy model – which they cannot afford.

PUHCA: Another significant development was the enactment of the Public Utility Holding Company Act which prevented the development of a national electricity sector, balkanizing America into the islands of isolated power. PUHCA ensured that America would have a weak national electricity grid.

The NIMBY Era: The last few decades have seen little positive policy moves. The emergence of the modern environmental era made it even more difficult to site anything, anywhere. NIMBY had long been an American problem and as we became wealthier it became worse. But NIMBY was replaced by BANANA and then NOPE⁸ – explaining the paralysis that affects so much of American energy policy today.

Greening of Electricity: The environmental movement also affected the power sector in other ways. Greens favor technology that is *appropriate* and *sustainable* and *safe*. They once feared that fossil fuels might soon “run out” and are now even more fearful that they may not. Air pollution, trace contaminants, and now global warming – all lead them to prefer conservation (various demand side management techniques) over building new plants, to favor renewable rather than fossil, hydro or nuclear power. One of the gurus in this movement, Amory Lovins, coined the term “negawatt” to indicate the energy available from improved conservation. *Conservation*, he argued, *is our largest source of electricity!* To which, I’ve always responded – *Yes and diets are our largest source of food – but try to feed a hungry man on someone else’s diet!* Nonetheless, regulators eager to please this new constituency and utilities eager to gain a new source of funds have enacted many of these green power mandates.

PURPA joined PUHCA: PURPA disturbed the status quo. Independent electricity providers were freed of many of the traditional rules and that led many traditional utilities to create affiliates to market electricity outside their service area. In effect, PURPA inadvertently partially freed the industry from regulation. Since the rules allowed you to sell electricity to others with less government interference, some firms began to realize that life outside the government regulatory tent might have its advantages.

⁷ John Baden and Rick Stroup, TK

⁸ NIMBY is, of course, “Not In My Backyard.” BANANA is “Build Absolutely Nothing Anywhere Near Anyone” and NOPE is “Not On Planet Earth.”

Let us now move to the mismanaged regulatory process that has left electricity and so many other network industries in disarray. During the Ford/Carter era, America underwent an unusual period of deregulation. Rail, airlines, trucking and banking – all were “deregulated” to varying degrees.

Only rail deregulation has been a full success. As noted earlier, this reflects the fact that the rail industry came under government control only after a strong competitive grid structure had emerged. The younger electricity network consisted of many fledgling firms. One grid could be picked to “win” the franchise or the competing grids could be forced to merge into a “natural” monopoly. The “redundancy” inherent in the competitive grid structure could not so easily be eliminated. Thus, competing – albeit severely regulated – grids survived in the rail sector and provided an easier transition to an open market. There are only a handful of competing local electricity grids in America.

Much of the impetus for deregulation came from Europe where privatization was underway. The shift from government ownership forced the governments to consider what structure and regulations would be appropriate. Since the UK utilities had been state enterprises there was no experience with competitive grids and so the grid element was viewed passively – generation would be liberalized, the grid would serve simply as the means to link consumers and producers. That template became the model for “deregulation” in California and other states.

But there are many a slip between cup and lip and the California regulatory experiences provide a graduate course in how change can be mismanaged. The initial proposals were sensible but the eventual bill contained many rigidities: generators were required to divest themselves of their transmission facilities, wholesale rates were largely deregulated but retail rates were frozen, firms were granted higher-than-market rates to permit recovery of “stranded costs,” green power mandates were extended, contracts between the transmission companies and suppliers were forbidden (everything was thrown into the spot market), and (of course) a “must serve” rule was maintained for the transmission companies themselves. The rules coupled with a tight supply/demand situation in California resulted in major problems. Transmission companies found themselves buying high and selling low and some were pushed into bankruptcy. Some have argued that California was seduced by wicked Texas utilities – but if so California had created a system which made that seduction very easy indeed.

The plight of electricity regulation in America is akin to that of freight rail regulation. Consider the following quote from a U.S. Department of Transportation Report in 1978, shortly before the dramatic changes that would revitalize this vital network sector of the economy:

The current system of railroad regulation reflects a series of uncoordinated actions intended to remedy specific problems encountered during the almost 100 years since the regulatory system was first imposed. The result is a hodgepodge of inconsistent and often anachronistic regulations that no longer correspond to

the economic condition of the railroads, the nature of intermodal competition, or the often conflicting needs of shippers, consumers, and taxpayers (as quoted in Jerry Ellig, "Railroad Deregulation and Consumer Welfare." Journal of Regulatory Economics, 21:2 143-167, 2002, Kluwer Academic Publishers)

What mistakes have been made in deregulation to date?

True deregulation would shift both grid and flows to the market, allowing competition and differential pricing to ensure efficient operations and investment policies. Efficiency requires that we carefully integrate these two components to achieve an efficient network. Yet, deregulation now means the breakup of vertically integrated electricity firms into a generation sector freed of regulatory constraints and open to entry and a transmission and distribution sector closed to entry, subject to "open access" and regulation. Breaking up network industries (or failure to integrate sectors already broken up such as the airlines) has created much confusion.

Breakup, however, even if deemed necessary – need not have taken the path of vertical disintegration. Consider the lowly green bean. There are two canonical means of breaking the bean into pieces: the traditional "snap bean" akin to the vertical disintegration model dominating the electricity deregulation fight and the "French cut" which slices the bean into parallel equivalent threads. This latter model preserves the potential efficiency and management gains of vertical integration but begins the process of restoring the competing grid reality that would likely have evolved had the Progressive Era not sidetracked this industry.

As the natural monopoly case for excluding outside suppliers of electricity has faded, regulatory proponents have begun to champion consumer choice. But, since competitive grids do not yet exist, the question is how can consumers purchase electricity off-grid. As noted, the "solution" is to mandate that grids provide *open access* to any and all firms wishing to ship electricity over their wires. The grids become common carriers, subject to rate regulation.

This partial deregulation creates many problems. Since transmission is a critical part of network services, some means of compensating the grid is essential. The goal is a "fair price," but determining fairness is always a complex task. An open access rule provides little reason for anyone to evolve independent transmission or distribution capacity. It provides weak incentives to invest in innovative grid transmission technology. In the absence of a market for varying quality services, how can anyone know whether the costs of ensuring higher quality electricity flows are justified by the value to the users in a regulated grid?

Markets allow one to test the value of a new offering – and provide the revenues to make those investments possible. Among the many promising innovations which might make for a more productive grid are high temperature superconductor lines, wave/surge protectors for the grid, wider reliance on distributed generation, demand-based pricing

systems, creative right-of-way alternatives, flexible alternative-current transmission (teaching electrons to flow where you want them to go), and a host of other potential improvements.

Yet, the recent FERC proposals argue that we should create a nationwide-system of monopoly transmission franchises, the so-called Regional Transmission Organizations. These would be regulated by FERC and charged with ensuring efficient and non-discriminatory flows of electricity across America. Rates must be set to ensure the viability of the grid. The rates must encourage investment in grid expansion, management, and innovation. Finally, the rates must move usage to periods and regions where costs are lower. Regulated rates have rarely encouraged entrepreneurial investment. Only the potential of extraordinary profits tempts the businessmen into exploring the technology frontier.

Some have argued that the most important goal of the grid should be to create a standardized product and there are certainly advantages of dealing with a commodity product. But, markets are not about standardization – the commodification of goods and services – but rather about the dynamic interplay between the virtues of an economical plain vanilla and a more expensive speciality product. Markets go back and forth on this theme – first, standardizing to realize the economies of scope and scale that are so important to lowering consumer costs. But, then, when the system has learned how to achieve efficient homogeneity, markets tend again to differentiate – to find ways to satisfy the specialized needs of their customers.

Examples of this process are common throughout American economic history: mom-and-pop bakeries gave way to standardized “Wonder Bread” but then as we learned the lessons of efficient manufacture and distribution (and became wealthier as a result), Pepperidge Farm moved to provide us more breads (and cookies and muffins and ...) than ever in history. Inefficient heterogeneity gives way to efficient homogeneity to efficient heterogeneity. Standardization is neither a virtue or a vice – we must look beyond that debate to consider a way to move the debate toward a more consumer-driven process. Consumers – not bureaucrats -- should determine the correct amount of standardization. The great growth in the markets for home and office based electricity enhancement systems suggests that a market may well result for higher quality electricity services. Some have argued that the future reliability must improve given the sensitivity of some users. Mills and Huber talk about the 3 nines standard moving upward to a 6 nines standard, meaning that quality for at least some specialized sub-circuits in the grid might well find a market.

At a recent conference in Washington⁹, Pat Wood suggested that a model for handling the grid aspects of a deregulated electricity system would be the way that the airports and air traffic controls system is managed in the air travel sector. Wood clearly knows little about the massive problems that the lack of integration has created in this sector. Airlines have no control over their ability to land or take off in any reasonable period; they cannot readily modernize capacity where it would be most valuable; they cannot bid for

⁹ Conference, Progress and Freedom Foundation, October 25, 2002.

expedited transit; they are burdened both directly and indirectly with high-cost, low-quality grid services with no recourse. Few systems better illustrate the need for vertical integration than the air travel sector – it is no model for anything good.

FERC proposes to “solve” the transmission problem by creating a standardized transmission grid. That grid would be tweaked by the regulators to expand and innovate. Raymond Gifford, PUC Commissioner of Colorado, noted that the SMD (Standard Market Design) resembled nothing more than the Gosplan – a political master plan created outside the exchange world needed to assess its validity. FERC seems to think its task is to creatively manipulate information about the values of various types of service to realize efficiently the desired result. But absent a market the information needed to make those decisions does not exist.

One of the major shifts by railroads once freed from political restraints was to differentiate their products, to move from a “standardized” product to a “differentiated” product. Those changes required more costly flow controls and often investment in specialized transmission capability. Railroads justified those investments by contractual arrangements with quality-demanding consumers – *just-in-time* deliveries were one creative result of that process. One positive feature of the air travel example is that airlines are free (presuming always that they can acquire the grid space) to “invade” the marketing area of a rival. Electricity firms should have the same freedom. In the airline area, note that firms can and do share gates at airports for compensation but that no mechanism exists for them to buy/sell priority rights on take-off and landings. (Slots – the right to land at an airport at all – are sold but these constitute a rigid form of entry/exit.)

Markets may not be *competitive* today but they quickly become *contestible*. We should do nothing to inhibit that trend toward contestability. A contestible market might arise by some outside firm stringing wires to the user but is more likely to take the form of firms dropping off the grid or signing demand-based contracts.

What is needed to allow the electricity sector to again move to the frontier of the American economy?

As noted earlier, railroads were a more mature industry before the Progressives regulated them – thus, competing grids were already the rule. Thus, regulated competing grids became the approach. That has made it easier to deregulate the grid as well as the flows. When the nation’s freight railroads were deregulated, both tracks and trains went into the private sector. That model might well be employed in the electricity area.

To start the process a utility should certainly be allowed to “invade” the territory of existing transmission companies. ROW are not easily acquired but there should be no artificial barrier to firms partnering with water companies, cable television, telephone,

sewer, gas or even joint-ventures with other electrical firms to link with key customers in a grid.¹⁰

That is exactly the model that disciplines major airlines in the air travel world. A firm can “invade” the territory of another and is induced to do so when profits rise in that market. Firms have every incentive to discipline themselves lest they encourage such invasions.

Unlike the railroads, there are few competing grids in the electricity field; therefore the challenge of transitioning to a free market is harder. A transitional rule may be necessary to ensure continued pressure to deregulate, while still allowing optimal freedom in the short run. To minimize this monopoly power fear, it would be useful to open all federal right-of-ways (interstate highways, public lands) to private investors wishing to use those corridors to create competitive grids. We might also devise zones of acceptable rates with the permissible range gradually broadening. The goal should be to encourage a swift shift from reliance on the regulatory structure to private arrangements.

The model here is the *Captive Shipper Rule* established in the rail deregulation legislation. A criteria is established to determine whether a shipper merits some form of “protection” from exploitation. The provision is crafted so as to encourage both parties to reach a private agreement – not to rely on the slow and uncertain political process.

As noted earlier, had there been no intervention in the fledgling electricity industry, competitive grids would crisscross America’s metropolitan regions. Distributed generation technologies might be far more pervasive with creative bi-directional grids allowing consumers and generators to directly communicate on a continual basis their respective offerings.

In some ways, electricity grids may face more discipline than other network industries. Most networks face competition only from competing grids. In the electricity sector, like in the telephone area, there is an alternative delivery mode – cell phones in the telephone area, distributed generation in the case of power. The presumption seems to be that distributed generation is an anomaly, that centralized power will always dominate the scene. Yet, in Japan, the very high prices of electricity have encouraged a massive increase in reliance on DG. That suggests that DG may well play a more significant disciplining role than most have realized.

Capacity would be determined far more by the management system of the grid than by the physical plant. The grids would be smart grids, able to redirect electricity continuously across the grid, able to vary quality to various customers for a fee, with high temperature superconducting lines providing high-capacity in areas of high value. Also,

¹⁰ Obtaining the ROW along existing routes of non-electricity services may be the best way to address also the NIMBY problem. However, another approach might be to plot several different routings, assign dollar amounts one would pay to acquire each route, and then sign option contracts with the various landowners that would be collectible only if their route were the first to be completed.

the grid would be equipped with various load stabilization devices to minimize outages and to allow reduced physical plant.

Competitive grids should not be viewed as wasteful or duplicative. Indeed, if redundancy is wasteful, then government has been by far a worse culprit. After all, most communities are today “wired” with numerous right-of-ways to carry electricity but also cable television, telephones, water, gas, and sewerage. Had the progressives not blocked that path, any or all of these right-of-ways might have partnered with competitive electricity providers to reduce the overall costs of supplying access. Indeed, history notes that the telegraph wires were often placed along the rail tracks. Competitive grids would discipline any network that was over-charging its customers.

Note that competition need not be everywhere to be effective. The barriers-to-entry argument provides a very strong incentive to a firm to avoid attracting competitors (see Appendix A). Even a small capture of the market can motivate the vested firm to price carefully. Whatever power might be exercised by the utility “monopoly” is offset by the risks of “stranding” the high-cost investment needed to provide service. A firm that abuses its market position via misguided pricing policies would attract competition. The result can be disastrous to the abusive firm.

But what of the argument that a new firm cannot immediately enter a market, that any move by current consumers to favor that newcomer might trigger market retaliation? And what of the risk of relying upon a potentially low-cost but untried and untested power supplier? These are legitimate concerns but they can be addressed by prior private contracts. After all, no one need know that you’re negotiated a deal with a new entry provider. Contractual options to reduce the risks of changeover are a basic risk management strategy. Some smaller communities have guaranteed a certain minimum to a new entry airlines (a situation where fixed costs and thus pressures to accept such accommodations are minute). Recall the publishing strike in England where the firm had built a modern non-union printing press and trained management to operate that plant. The unions struck – and management moved, secure in their knowledge that they had created an alternative supply line. Prior contracts to attract entry by rival providers has recently been employed in the airline sector.

We should also explore the possibility of allowing the utility firm to buy-out the right to be served. Such an option would encourage firms to seek out alternative suppliers, to sign long term favorable contracts from their current supplier, or even to move toward DG themselves. The goal is to gradually recreate the competitive grid structure that was destroyed by the progressives.

However, there are no systems lacking alternatives of some sort. All firms can exploit their current consumer base but it would be foolish to do so. Bill Gates noted this several years ago, pointing out that, while it is easy to raise prices and profits in the short run, such policies can all too easily attract new entry competitors and create major downstream problems.

America's electrical grid has long been uni-directional – electricity flows to users, nothing flows back to the providers. Markets work best when flows of information are continual and bi-directional. Absent this rich exchange world there is little information on the appropriate pricing rules. Rates in such circumstances too often are cost-based which creates major problems when dealing with declining marginal cost industries (and most are). In a bi-directional grid, firms send out varying price/quality/quantity offers and receive back counter-offers or decisions to purchase. Firms quickly find whether various quality upgrades justify the necessary investments and maintenance costs (how much demand, for example, exists for the fabled 6 nines level of electricity quality?). During periods of “congestion” on the system rising prices motivate users to swiftly adjust their usage levels (responses might include negotiated intermittent use contracts, technologies to respond to price hikes with creative power use strategies – for example, heating water earlier in the day), simple reduced use, time shifting of power uses, and possible occasional reliance on DG).

A dumb grid must build in much more fixed-capacity than a smart grid. (See Appendix B note on the capacity question) One knows only that the system in total has covered the costs of that expanded investment. A smart grid can work at the margins – for how long and by how much will peak usage levels exceed normal usage levels?

Appendix A: Arguments Against Natural Monopoly

The theory developed to justify political control of electricity and other “public utilities” was natural monopoly. The concept grew out of two related but distinct ideas: the belief that selected industries would have declining marginal costs (the cost of producing each additional item would decline) and/or the view that efficiency demanded that only one network exist in any specific area. The idea was that some industries would require large amounts of capital (high fixed costs) and then exhibit low operating costs over the range of likely demand. In this situation, one firm could most economically serve the market – a potentially desirable result. However, the argument went, once established that firm would then exploit consumers by charging prices above marginal costs – reducing use at levels that would be socially valuable. A related argument was that competition in network sectors (water, electricity, natural gas) with costly grids would be wasteful. The logic in both cases was that a wise, thoughtful political regulating agency should allow the monopoly (indeed, create it) but then watch carefully over its pricing policies. Sometimes, this argument was associated with the desirability of subsidizing output from such declining marginal cost industries.ⁱ

As Coase notes, these arguments are silly. Empirically, most industries face declining marginal costs much of the time. In effect, the challenge of financing such activities requires that the firms engage in more sophisticated pricing policies: differentiated (demand-based) pricing, fixed charges to gain access to the service, prior purchase arrangements, and other multi-part pricing schemes. The basic question, after all, is whether society should or should not produce some good or service? Is the value of that service greater than the costs of providing it? Politics does nothing to address that problem. Political institutions favor cost-based pricing rules which will fail to cover provision costs. They then arbitrarily allow fixed charges to “make up the difference.” Since, however, absent an exchange market for electricity, there is little information on the demand curve for a good, the prospects for this exercise having any validity are remote.

There are other arguments against the “natural monopoly” case for creating regional regulated monopolies.

First, note that natural monopolies are rarely seen in nature. Indeed, when Samuel Insull succeeded in persuading the political authorities to grant his firm that status, AT&T was losing market share in Chicago. Somehow the market was finding it possible to allow competition at a time when “barriers to entry” were high and profits scarce.

Second, if there is anything “natural” about utility monopolies, it clearly is the large investment to acquire and create the right-of-ways needed for their distribution grid. If government were truly concerned about eliminating redundancy, then they would have created (directly or via another regulated monopoly franchise arrangement) a right-of-way agency to create “chases” along which might flow the various pipes, wires and cables of our modern society. Instead each such utility digs up the streets in turn. We see

the use of shared right-of-way only in the free and less-regulated parts of our economy (in malls and larger buildings, for example).

Third, this argument fails to realize that a barrier to entry is also a sunk cost! A firm is disciplined by the realistic fear that any effort to exploit its customer base – in a free market – might well attract new entrants. If the natural monopoly argument has any validity, such entry will raise everyone’s average cost making it harder to recover fixed costs. Moreover, any true exploitation may well create a willingness on the part of current consumers to contract with such new entrants to long term contracts or even cost-sharing arrangements. No one has more to lose than a high-fixed cost firm which drives its customers into the arms of another.

Fourth, the view of monopoly profits fails to note that high profits also attract competitors – firms outside the existing industry will seek new institutional arrangements (distributed power, co-generation), seek to lock in disgruntled current consumers to their services in profitable ways, invest in technologies that allow alternative delivery methods (distributed power, partnered distribution with other utility services, satellite TV). Natural monopolies where prices and profits are high should be viewed as the most competitive parts of the economy – they are the areas which attract the most innovative responses. Of course, this is true only when the legal structure allows competition – that is, where regional monopolies are not politically protected.

Fifth, the natural monopoly is based on a market failure argument and there are clearly offsetting governmental failures. Regulators face great difficulties in developing rational investment and operating policies (in the absence of an exchange market, the information to make such decisions wisely does not exist). Moreover, political concerns (the public choice problems) are all too likely to favor some users, some producers, some technologies (green power, for example) even when these options are more costly.

Sixth, the argument of wasteful redundancy is an argument raised against competitive markets generally. America, it is argued, has too many fast food restaurants, too many distribution outlets, too many auto dealers and on and on. Yet, that diversity is maintained by individuals risking their money and, thus, presumably believing that these investments are rational. How a political process might improve upon that system is unclear. Note, for example, that newspaper delivery is almost always provided independently even though many people receive multiple papers daily. Why has that fact encouraged the emergence of a monopoly delivery service? Apparently, there are costs (probabilistic uncertainties in time of delivery, low correlation of joint purchases, increased probability of delivery mistakes?) which argue against this trend. The “natural monopoly” argument for single-delivery services seems plausible but reality says no!

The theory of “natural” monopoly is defective in still on other sense. High fixed cost industries do have problems with capacity expansion. A feast or famine mode is all too typical in the mining, auto and utility sectors of many national economies. But is it possible that this problem has been exacerbated by the prohibitions against cooperative arrangements to structure expansion? Joint ventures provide one way of smoothing capacity expansion as would cooperative arrangements to determine “optimal” capacity

expansion and then auction that “right” off to the members of the cooperative. These options, of course, are precluded by the antitrust laws.

Expansions in consumer demand may be seen as a new commons – and like all commons they are likely to be exploited. Firms rush in to expand, too much new capacity is seeking too few consumers and a glut ensues. Consumers benefit in spurts and starts – being under-charged and over-charged from the long run perspective. That risk premium discourages overall growth and welfare. Would it be possible for firms to coordinate their capacity expansion plans? What test would the antitrust regulators impose to ensure that this test was suitable?

In general, therefore, the theoretic case for regulated monopolies seems unwise.

ⁱ Ronald Coase, *The Marginal Cost Controversy* in **The Firm, the Market and the Law**,

Appendix B: Capacity Issues

Electricity cannot be stored readily; therefore, it is necessary to either have excess capacity or to have a system that raises prices or reduces demand (by selected users) as that capacity restraint is approached. Regulation can inhibit that response capability, reducing capacity. Freeing the system, in contrast, can enhance capacity by encouraging the development of positive feedback loops – as capacity limits are approached, prices increase and demand decreases to slow or reverse that trend. In Texas, a study of electricity deregulation found that deregulation might increase capacity by 13 to 25 percentⁱ.

Capacity is not merely a measure of the summed generating capacity of the various generators on the grid, but also the ability to acquire electricity from off-grid (via interconnects) and the ability to restore capacity downed by storms or power surges quickly. Technological and institutional changes can similarly affect capacity.

The costs of electricity includes the cost of building and maintaining the capacity needed to meet the “must serve” rule except in highly unusual circumstances. To meet that requirement, regulators impose reserve requirements on utilities. That is, government experts estimate expected demand over time and mandate that the utility will have a certain over-capacity – to allow for unexpected breakdowns, surges in demand (heat or cold waves) and so forth. But capacity is a complex phenomena and capacity utilization

even more so. For example, in my house, my refrigerator is used 24/7 but the load factor of my exercise bike is pathetically low.