



THE STATE OF
ELECTRICITY DEREGULATION

Electricity Deregulation: What Impact Will It Have On Hampton Roads?

No matter how many times you flick the switch, lights don't work without electricity.

"Lessons from Izzy," Anonymous (The Virginian-Pilot, Oct. 6, 2003)

Virginia is on the verge of deregulating its electrical generation, transmission and distribution industries. The 1999 Virginia Electric Utility Restructuring Act delineated rules to be followed in the deregulation and established a schedule (since delayed) for it to occur. Supporters of the Act point to evidence that electricity rates often have fallen in states that have deregulated. They assert that deregulation achieves lower costs by increasing competition and providing consumers with a choice of suppliers. They also cite the successful deregulation of industries such as airlines and telecommunications as evidence of what could happen with electricity deregulation.

Opponents of deregulation believe it is foolish to reduce supervision of a monopolist and point to chicanery in partially deregulated electricity markets such as California as evidence that electricity is one utility where competition simply will not work well. They also note that the prospect of electricity deregulation in Virginia has not attracted new competitive suppliers, a necessity if deregulation is to work as advertised.

What about Hampton Roads, where the only electricity supplier of consequence is Dominion Virginia Power? How would the 1.6 million residents of our region be impacted by electricity deregulation? Would we be better off if and when deregulation actually occurs? As we shall see, the answers to these questions are not clear.

How Well Has Deregulation Worked In Other Industries?

If one knew nothing at all about electricity deregulation, then the experience of deregulation in other industries would be the primary means by which we would infer the probable effects of electricity deregulation upon Hampton Roads. The 1980s and 1990s saw a wave of deregulatory actions sweep the United States. A variety of industries, including natural gas production, airlines, telecommunications and aspects of banking (especially savings and loan associations), were deregulated, wholly or partially. What do these experiences have to tell us about how electricity deregulation might work in Virginia?

Is the typical consumer better off as a result of the deregulation of these industries? The answer is a clear "yes" where airlines and telecommunications are concerned. Adjusted for inflation, the price of air travel now is much less expensive than it used to be and more travel options are available. In the case of telecommunications, long-distance telephone rates have fallen dramatically and new developments such as cellular technology have made phone services better than prior to deregulation.

The impact of deregulation is not so clear, however, if we focus on what happened in the natural gas industry and among savings and loan associations. Let's consider natural gas first. When natural gas was deregulated in 1978, regulators created an artificial distinction between "new" natural gas – gas discovered after deregulation – and "old" natural gas – that which was discovered prior to deregulation. The purpose was to protect firms that had discovered natural gas, but now might well find the value of their gas inventories greatly reduced if deregulation would lower prices. Thus, they would not be able to recapture the costs of their investments.

Analytically, a similar situation exists in electricity, where most firms argue they have “stranded costs” that must be taken into account as deregulation occurs. Utilities that have made substantial capital investments are concerned that they will not be able to recapture the costs of these investments after electricity deregulation occurs. They believe deregulation will depress prices to a level that will not provide reimbursement for their investments in plant and equipment.

The deregulation of savings and loan associations (S&Ls) produced interesting and, in some cases, tragic behavior. Regulators quickly deregulated interest rates and allowed these thrift institutions to pay any amount they desired to attract deposits. At first, this was very attractive to savers, not the least because the federal government insured funds deposited at S&Ls up to \$100,000 per account. Knowing their actions were “covered” by the federal government, some S&Ls began to pay high interest rates in order to attract funds, which they then used to make speculative investments, often in real estate. The result was imprudent behavior that ultimately led to a large federal bailout and forced restructuring of the thrift industry in the wake of several large S&L failures.

Stranded Costs refer to expenditures regulated firms have made that they fear will not be recoverable when they move to a deregulated environment. The critical question is whether the Commonwealth will compensate regulated firms for these costs when deregulation occurs. This is one of several major deregulation issues that has yet to be resolved.

A Primer On Electricity Markets And Deregulation

There are three distinct segments in markets for electricity: generation, transmission and distribution. Electricity is generated by burning coal, gas or oil, or by a combination of these, or by utilizing nuclear energy. However generated, electricity is difficult to store and therefore the demand for it is highly variable because of weather conditions and natural disasters. This often means there can be large swings in electricity prices because market power may rest with a few firms that have the excess supply or the available production capacity to meet periodic peak demands. Since there are no close substitutes for electricity, in the short run even substantial increases in electricity prices will not influence consumers or suppliers very much. The bottom line is that electricity generation, transmission and distribution are not markets that behave in the fashion of air travel or telecommunications, where deregulation has proven quite successful.

The most important motivation for the original regulation of the electricity industry was a desire to create competition and eliminate the “natural monopoly” status of most firms in these markets. A natural monopoly exists when it would not be economically efficient for more than a single firm to supply a good or service. Usually, this means that this firm’s average costs of production fall significantly as it expands its output so that the larger it becomes, the more cost-efficient it becomes. The upshot is that it is then more efficient for one firm to provide all the output because the same output shared between two firms would be more expensive to produce and supply. Intuitively, we understand that it would not be efficient to have five different electrical distribution systems serving Hampton Roads. Imagine the duplicative profusion of wires, poles and generators (and expense) this would require.

Many believe the supply of electricity reflects natural monopoly characteristics. Thus, they contend that ordinarily only one firm should supply electricity in a given location. It is this monopoly that regulators usually attempt to control, often by setting electricity prices and regulating rates of profit.

But what is the appropriate price for electricity? And how much profit should an electricity firm be permitted to earn? These may seem like straightforward questions, but they are not. Consider attempts to regulate a firm’s profit rate. Profit rate on what? Usually, regulators attempt to control an electrical utility’s rate of profit on the capital that it invested in order to generate, transmit and distribute its electricity. However, who determines what those investments are worth and how they are depreciated? And, might not a utility deliberately over-invest in plant and equipment so that it can justify higher prices and profits?

When a regulatory body determines what prices electricity firms can charge, should it force some consumers to subsidize other consumers (perhaps low-income or elderly citizens) at the expense of others? What if some consumers use most of their electricity at 2 a.m., for example? Should they pay the same price per kilowatt-hour as consumers who use their

electricity at peak-use times when the temperature is 100 degrees? We pose these questions so the reader will understand that regulating the electricity industry is a far more complex proposition than it might first appear.

Evidence From The States

Table 1 reports that 19 states have been active in the deregulation of electricity. Coal is the most common production fuel for electricity nationally and it is the dominant energy source in Virginia. Natural gas (which is extremely cost-efficient), nuclear power, water, dual-firing (using two different technologies, typically coal and natural gas) and petroleum are used less frequently. Virginia obtains slightly more than half of its electrical power from burning coal, but increasingly is relying upon natural gas.

Who produces this electricity? In Virginia, public utilities produced about 84 percent of all electricity in 2002. At the other end of the spectrum, public utilities produce less than 10 percent of the electricity in states such as Connecticut, Delaware, Maine, Maryland, New Jersey and Rhode Island, and the District of Columbia. Many of these states began the process of deregulating electricity production in the mid-1990s, perhaps because they believed they had the most to gain.

What has happened to electricity prices in the states where electricity regulation has occurred? Table 2 reports electricity prices per kilowatt-hour in 2002. In general, states that regulate electricity offer the lowest electricity prices, though this crude analysis does not account for the state's location, the availability of various fuels, the quality of service or what has been happening to electricity prices since deregulation began. For example, Paul Joskow ("Electricity Deregulation: Where from Here," 2003) compared electricity prices in the pre-deregulation year of 1995 and the post-deregulation year of 2002. He found significant declines in the residential retail electricity prices in deregulated New Jersey (about 14 percent) and deregulated Illinois (about 18 percent), with smaller declines in deregulated Massachusetts, Maine, New York, Pennsylvania and Ohio. Over the same time period, prices rose slightly in the United States as a whole. Only in California and Texas were the post-deregulation prices greater than the pre-deregulation prices. Thus, we have a mixed verdict. Regulated states often offer the lowest electricity prices; however, when deregulation does occur, it often reduces prices, or at least diminishes their rate of increase.

Nonetheless, of the states actively involved in deregulation, Virginia currently offers the lowest average electricity prices. The Commonwealth's average electricity price is below the national average and Virginia ranks 30th among the states in terms of electricity prices per kilowatt-hour. Hence, while Virginia might well gain from electricity deregulation, its potential gains are much less than those of some other states.

The California Episode

In 2002-03, partial electricity deregulation resulted in some severe market distortions and rolling brownouts that cost both California and electricity customers many billions of dollars. This experience continues to exert a major influence on electricity deregulation in Virginia.

Increased consumer demand in California forced suppliers to resort to external markets to purchase the electricity necessary to meet it. The prices they were forced to pay were dramatically higher in some instances. Further, the California electricity suppliers were not allowed to engage in significant "peak load" pricing that would have charged consumers higher prices for using electricity during high-demand periods and lower prices other times. Such a pricing policy would have encouraged consumers to diminish their use of electricity and/or change the time pattern of their usage.

This was a "perfect storm" in electricity pricing. California suppliers faced increased demand, but could not adjust their prices to deal with it. That is, while the market was partially deregulated, prices to consumers were not.

What lessons can we draw from this? First, partial deregulation of a monopoly often is a bad idea. It is bad policy to deregulate the supply side of a firm, but not the demand side, or vice versa. Market manipulation can still occur and it did in California. Second, charging all electricity consumers the same price, regardless of how, when and where they consume that electricity, may be politically attractive, but is economic nonsense and leads to problems.

Who Might Gain The Most From Deregulation?

Matthew White, in a study published in the "Brookings Papers on Economic Activity" in 1996, provided an interesting analysis of how much various states would likely gain from the deregulation of the production of electricity. White estimated what economists label "consumer's surplus." Consumer's surplus is what individuals are willing to pay for a product over and above the actual price that is paid. For example, if one is willing to pay 12 cents for a kilowatt-hour of electricity but is required to pay only 8 cents, the consumer's surplus for that kilowatt-hour of electricity is 4 cents. The greater the consumer's surplus, the better off financially consumers are. If deregulation diminishes prices, then it increases consumer's surplus.

Table 2 presents White's consumer's surplus calculations for the states that have been active in electricity production restructuring. In order to provide some context for these numbers, we provide the decile (10th) for each state. For example, a 2 represents the 20th decile and indicates that at least 80 percent of states have a lower consumer's surplus estimate. Thus, the lower the decile number, the more a state has to gain.

White's estimates closely track the states that have been active in electricity restructuring. In general, those with the most to gain have pursued electricity deregulation most vigorously. White's estimates reveal that Virginia clearly would benefit from the deregulation of the production of electricity, though not to the same degree as larger Northeastern states where electricity prices are much higher. This reflects the fact that electricity prices are not especially high in Virginia.

The Confused Deregulation Process In Virginia

The Virginia Electric Utility Restructuring Act was passed by the General Assembly in 1999. It appeared to include a schedule for deregulation that would have resulted in significant deregulation of electricity rates in 2006-07. However, subsequent legislative action slowed this deregulation process and maintained the current regulatory caps on electricity rates until 2010, an extension of 3 1/2 years. The General Assembly seems to be having second thoughts about the benefits of electricity deregulation and is not ready to eliminate electricity price controls.

Kenneth Rose, in a 2003 study for the General Assembly, provided a detailed evaluation of the current status of the Commonwealth's deregulation of electricity. An economist with the National Regulatory Research Institute, Rose found little interest from outside firms that might enter the Virginia market and competitively supply new electricity. This is a problematic result insofar as deregulation is concerned because one of the important benefits of deregulation is the appearance of new suppliers to provide consumers with choice.

Rose's report did nothing to reduce the fears of some legislators that a California-like situation could emerge in Virginia and that the large electric utilities are controlling the process of deregulation to further their own interests.

Consumers, however, have been far from united in terms of their reactions to electricity deregulation. Some large consumers of electricity (such as Smithfield Foods) and the Commonwealth's dominant producer of electricity (Dominion Virginia Power, which supplies almost 68 percent of Virginia's electricity and virtually 100 percent in Hampton Roads) have strongly supported deregulation. However, other significant consumers of electricity, including nonprofit cooperatives and large customers such as Sentara Norfolk General Hospital and Ford Motor Co., have argued that deregulation efforts should be stopped. Indeed, these customers, plus several groups that purport to represent the interests of consumers in general, not only oppose deregulation, but also are opposed to extending electricity rate caps. They believe suppliers such as Dominion Virginia Power currently are allowed to earn a rate of return that is too high. Suffice it to say that Virginia electricity consumers have not been speaking with one voice.

Even while these discussions have been occurring, there is evidence that Virginia's electricity production capacity has been increasing. Between 1998 and 2003, eight new power plants began operation in Virginia. The three largest are associated with Dominion Virginia Power. Two other plants are under construction and the State Corporation Commission has approved four others. Of these 14 new production facilities, all but one are fueled by cost-efficient natural gas. This suggests that Virginia's traditional reliance upon coal to generate electricity is going to decline.

Virginia At A Crossroads

Virginia stands at a crossroads in the deregulation of electricity. It began to move toward electricity deregulation in the 1990s, but has shied away from taking the final steps in that direction. Nationally, those states that have benefited from deregulation have done so because they have been able to attract additional independent suppliers of electricity. That is, deregulation has increased competition and consumer choice. Thus far, this has not happened in Virginia, though it's also fair to note that deregulation hasn't actually occurred yet. Those states that have benefited from deregulation also have been able to develop regional transmission and supply networks to buffer themselves from the types of supply-and-demand fluctuations that occurred in California. Once again, this has not yet happened in Virginia. This development would appear to be less dependent upon deregulation, per se.

There is some good news, however. The prospect of deregulation appears to be primarily responsible for an increased investment in production facilities by firms such as Dominion Virginia Power. Nearly all of these new facilities are fired by lower-cost natural gas, which should translate into lower prices for electricity, whether or not deregulation occurs.

Is Virginia really going to take the plunge and deregulate electricity, or not? No one really knows, since this is, in part, a political issue. One thing is certain, however: **The deregulatory fever that pervaded the General Assembly in the 1990s has dissipated. Many legislators, perhaps a majority, have become "mugwumps" who now neatly attempt to straddle contradictory positions on deregulation, sometimes depending upon their audience. This is a recipe for the status quo, which means talking about deregulation, but not actually carrying it out.**

TABLE 1

**CHARACTERISTICS OF POWER GENERATION
IN STATES ACTIVE IN ELECTRICITY DEREGULATION**

State	2002 Average Price per kWh	Primary Energy Source	Primary Energy Share of Total	Utility Production Share 2002	Change in Utility Share: 1996-2002
California	12.5	Gas	44.7	40.5	-24.4
Illinois	6.97	Coal	35.0	9.1	-87.9
New Jersey	9.31	Dual-fired	33.7	2.5	-54.4
New York	11.29	Dual-fired	39.5	31.1	-45.7
Texas	6.62	Gas	50.9	38.8	-49.5
Pennsylvania	8.01	Coal	55.7	14.9	-76.7
Michigan	6.92	Coal	56.6	85.2	1.5
Massachusetts	10.18	Dual-fired	27.6	2.8	-72.6
Connecticut	9.73	Nuclear	47.6	0.1	-74.7
Ohio	6.66	Coal	72.1	95.1	-3.8
Virginia	6.23	Coal	50.8	83.8	-2.3
Maine	11.36	Gas	31.6	0	-31.2
Rhode Island	9.19	Gas	42.8	0.2	-46.0
New Hampshire	10.49	Nuclear	33.9	77.0	-12.8
Arizona	7.21	Coal	27.8	86.8	-12.2
District of Columbia	7.37	Petroleum	100.0	0	-100.0
Delaware	7.05	Coal	31.0	2.8	-91.1
Maryland	6.21	Coal	41.3	0.1	-95.4
Oregon	6.32	Hydro	72.8	84.4	-8.2

Source: Energy Information Administration/State Electricity Profiles 2002

TABLE 2

POTENTIAL STATE GAINS FROM DEREGULATION

State	Gain in Consumer Surplus ¹	Consumer Surplus Gain Decile	Investment in Gas-fired Technology ²	Percentage Change in Natural Gas
New Jersey	\$1,688	1	1,097	-12.5
Pennsylvania	1,275	2	284	-7.0
Virginia	349	3	471	366.1
District of Columbia	150	5	NM	NM
Delaware	8	6	52	113.4
Maryland	35	6	54	-38.7
North Carolina	464	3	191	NM
South Carolina	2	7	26	-40.6
West Virginia	0	9/10	24	91.4
Kentucky	0	9/10	NM	NM

¹In millions of dollars, calculated with an entry-inducing price of 3.5 cents per kilowatt-hour from Matthew W. White, 1996, "Power Struggles: Explaining Deregulatory Reforms in Electricity Markets," *Brookings Papers on Economic Activity*, pp. 201-250.

²In thousands of megawatt hours, from *Electric Power Monthly*, Table 1.9,

www.eia.doe/cneaf/electricity/epm/table1-9-1.html.

NM – not measurable because of small use of natural gas

