# Pennsylvania Public Utility Commission

Provider of Last Resort (POLR) Roundtable

Docket No. M-00041792

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## *FOREWORD*

The Pennsylvania Public Utility Commission (the "Commission") has played a leading role in the deregulation of retail electricity markets in the United States. The Commission can be justly proud of the workable retail market in the Commonwealth of Pennsylvania. Consistent with its commitment to the provision of reliable and affordable electric service, the Commission has convened a series of Roundtable meetings to explore the provision of Provider of Last Resort (POLR) service within its deregulated retail electric market. The Roundtable Issues List, issued by the Commission, contains a useful and comprehensive array of subjects ranging from the scope and terms of POLR service to the qualifications and compensation of POLR providers and the consequences of their potential default. The Commission has also encouraged parties to address other issues not contained on the list.

PA Consulting Group ("PA") is pleased to have been invited to participate in the Roundtable. We will offer a number of observations about relevant POLR situations in other parts of the country and the general conditions that could give way to instances of service disruptions and rate shock. We will also demonstrate the generic cyclicality of deregulated wholesale power markets and the great relevance this has to the provision of retail electric service throughout the entire market cycle. Finally, we will offer comments about the value of the options provided by POLR service to both shopping and non-shopping customers and the cost that those options impose upon POLR providers and their remaining bundled customers.

PA is a leading management, systems, and technology consulting firm, operating worldwide from over 40 offices in more than 20 countries. Established 60 years ago, PA's staff of 2,800 experts drives projects from the initial generation of ideas, all the way through to detailed implementation and beyond. Drawing on the experience and knowledge of its professionals, the Global Energy Group at PA delivers a wide range of strategies and services for leading electricity, water, natural gas and petroleum companies worldwide. With operations in North America, United Kingdom, France, Scandinavia, Australia, New Zealand, Southeast Asia, and South America, PA can operate flexibly around the world. Our client list spans nearly every continent and industrialized area and includes many of the world's most significant companies and energy providers. PA has offices worldwide and the following offices in the United States: Cambridge, Massachusetts; Washington, DC; Los Angeles, California; New York, New York; Houston, Texas; Boulder, Colorado; Princeton, NJ; and Madison, Wisconsin. PA is based in London, England. PA has been involved with the provision of market expert reports associated with the financing of generating assets across the United States and has been engaged by the banking community in several of the recent restructurings including Mirant, NRG, TECO Power, Dynegy, and NEG. PA is a leader in the use of simulation modeling techniques to analyze commodity markets.

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## 1. THE CALIFORNIA EXPERIENCE

International attention was focused last year on the spectacular political situation in California. An incumbent governor was ousted in a recall election, and a political novice, though also a famous movie star, won election. Among all the causes of that political situation, certainly high on the list were the consequences of the state's electricity deregulation program: the bankruptcy and near bankruptcy of the two largest investor-owned utilities (IOUs), the enormous debts incurred by the state to pay the electricity bill, and the spectacular charges of market manipulation against Enron and other market participants, many of whom are now defunct.

Although there are a wide variety of views on the causes of the California price spikes, there is general agreement that the requirement that the California utilities rely largely on the short-term wholesale market for capacity set the stage for extraordinary profiteering by a variety of market traders. The California utilities, as providers of last resort (POLR) to the retail customer base with no choice but to buy capacity on the short-term market, became appetizing fixed targets:

- The investor-owned utilities had to divest a large fraction of their generation to a relatively small number of unregulated parties;
- The utilities retained the obligation to serve all load that did not choose an alternative provider or, having chosen such a supplier, later returned to utility service, at a fixed price and with no notice requirements;
- The utilities had to obtain their physical supplies from spot markets with no incentive to hedge their short positions – in fact they perceived a regulatory incentive not to hedge;
- The spot markets were governed by strict rules that, being both mechanical and complex, could be taken advantage of by determined traders.

Compounding the problem was the fact that gas-fired electric capacity, which sets the price much of the time on the margin in that market, proved to be vastly more expensive than had been assumed during the legislative and regulatory deregulation process. The smallest of the three major Californian electric utilities had been released from its rate freeze before the run-up in wholesale prices in 2000, thus exposing its customers directly to the price spike. The Legislature acted to create a deferral mechanism to reduce those customers' rates. The two larger utilities were caught between a rock and a hard place: they were obliged to provide electricity at a capped price to their retail customers, while required to buy power on the wholesale market at higher prices. This untenable situation ultimately resulted in the state takeover of the purchasing obligation. The inability of California utilities to hedge their bets by covering their long-term supply obligations through customary means resulted in a financial catastrophe.

Throughout the United States, there are many different retail restructuring programs, almost all of which have the following components:

- The divestment by the incumbent electric utilities of all, or substantially all, of their generation portfolios; in some cases by auction to unregulated generators, and in other cases by transfers to unregulated units of the seller.

- Supply or vesting contracts with the new owners, whether utility affiliates or unregulated suppliers, to cover the incumbent's POLR obligations at least during a transition period.

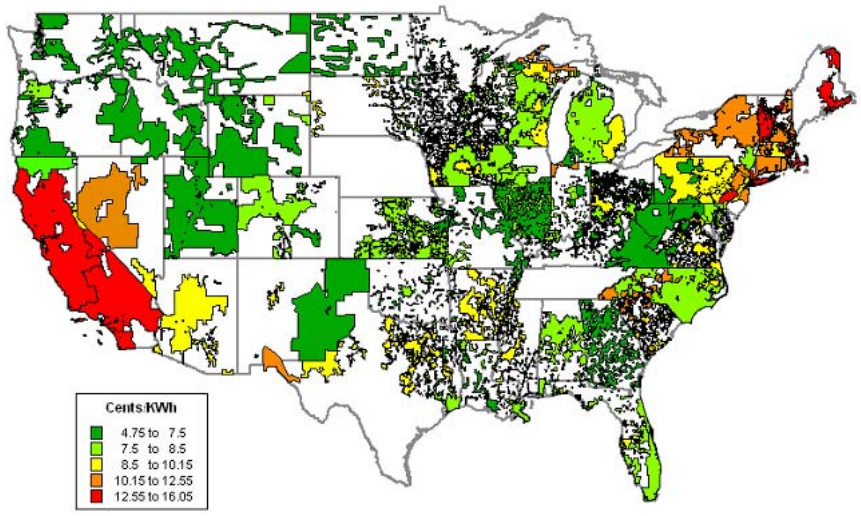
- Multiyear transition schemes in which the incumbent utilities agreed to the phased-in retail competition while retaining the obligation to be the provider of last resort to all non-shopping retail customers. In most cases the transition schemes require the incumbent utilities to provide electricity at a capped rate during the transition period.

While most of these programs avoid complete dependency on the short-term supply market, they face two substantial problems: one in common with California, and the other a new one. The common problem shared by many of the deregulation programs is that they were structured based on specific assumptions about price levels in the supply market, and those assumptions are critical to the financial viability of generation owners or retail suppliers (or both). Contrary to assumptions, natural gas prices have gone up and stayed up. As gas-fired generation sets the price on the margin in the wholesale markets most of the time in California, Texas and much of the Northeastern United States, entities with POLR obligations may face serious problems upon the expiration of their transitional supply contracts in circumstances where prevailing wholesale prices significantly exceed those assumed at the time of the setting of the transitional pricing. And as will be demonstrated in a subsequent segment of this report, wholesale market deregulation has greatly amplified the cyclicality of wholesale power markets, thus adding a new dimension of under- and over-capacity to the challenge posed by fluctuating fuel prices.

The new problem is that some of the obligated suppliers of generation are or may find themselves in substantial financial difficulty, compromising their ability to perform under their contracts. Very significant recent examples include the bankruptcies of several merchant generators such as NRG Energy and Mirant; those companies sought to use the bankruptcy process to disavow some of their supply obligations. Traditionally, retail electricity suppliers could substitute regulatory assurances – deferrals and balancing accounts – for merchant working capital. This was often referred to as a part of the "regulatory compact." Deregulation removed many of those policy props. Once the transition periods end, most of the transition programs provide for the retail utilities to acquire electric capacity on the market and pass the cost through to their customers. All of these developments create the potential for retail customers to be asked to absorb large increases in their rates. An interesting question to be played out in the future is the effect that deregulation will have on capital formation for new generation. The merchant generation business model was largely predicated upon highly leveraged new generation being constructed without substantial "anchor" offtake contracts. With the failure of so many merchant generators and the potential shifting of customers under retail competition, the availability of investment grade ratings for new construction remains to be seen.

Most of the transition programs are complex, with many nuances. So, too, are the supply obligations. Nevertheless, the potential for rate shock events can be roughly measured by comparisons between prevailing retail and wholesale rates.

## Residential Rates for IOUs

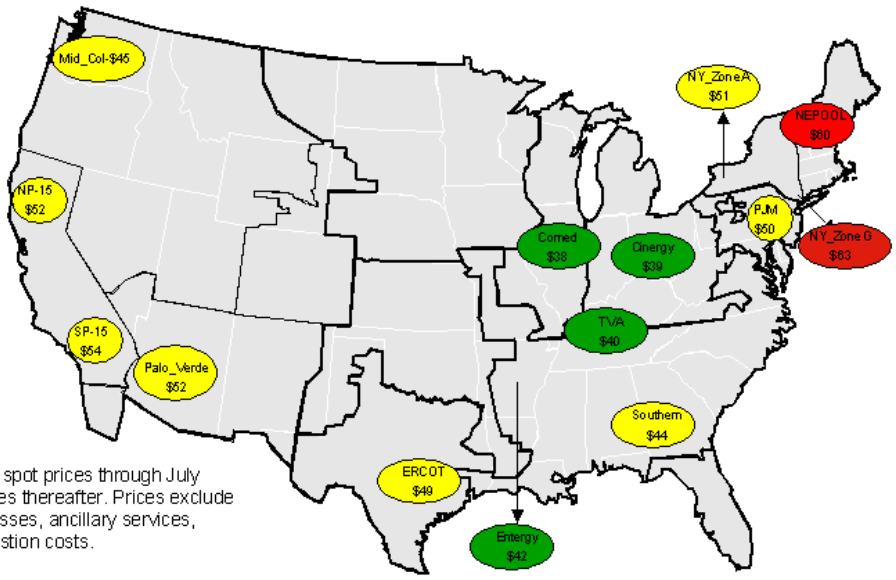



Source: EEI Winter 2003

The map above is color-coded to reflect the prevailing level of residential retail rates in the service territories of the IOUs in the United States. High-priced California stands out boldly on the map. So, too, do many portions of New England. With the exception of the Philadelphia area, rates in Pennsylvania are more moderate. In an ironic fashion, moderately-priced areas face a greater potential for rate shock upon the expiration of transition plans. This is because, in many cases, the prices shown on the map are the result of capped transition plan pricing. Once these plans expire, utilities will acquire capacity on the wholesale market, and pass these costs through to ratepayers, at least those who remain as customers.

A second dimension to the rate shock equation is of course the wholesale market. Reminiscent of the stagflation of bygone years (near recessionary conditions coupled with rising prices), the current glut of generating capacity does not control the level of natural gas prices (or other fuel prices for that matter), which sets the price on the margin much of the time in the markets in question. Making generalizations about likely levels of wholesale prices at the time the various transition plans expire, is a dangerous business. The markets in question are complex and diverse. They can be subject to rapid fluctuation. And buyers have many contractual options, which can substantially affect pricing. Nevertheless, a blended look at several of the established wholesale markets in the United States presents an interesting picture. *(Residential rates are expressed in the customary US cents per kilowatt-hour (kWh), while the wholesale rates below are expressed in megawatts dollars per hour ($/MWh), again the norm in that market. One thousand kWh equals one MWh. The comparatively higher residential rates reflect, among other things, the costs of standing ready to provide electricity to customers in any amount desired on an instantaneous basis.)*

**2003 Average On-Peak Wholesale Prices ($/MWh)**




Prices reflect on-peak spot prices through July 2003 and forward prices thereafter. Prices exclude any adjustments for losses, ancillary services, load shaping or congestion costs.

As is obvious, the Northeastern United States is a relatively expensive area. Utilities and ratepayers faced with expiring transition plans or defaulting suppliers or both, are likely in for a very rough time. The stakeholders in the retail electric community would be well-advised to make plans to handle these difficult issues better than their counterparts in California, where contentious, adversarial tactics have disadvantaged almost everyone except for the professional service providers who are well-paid to handle disputes.

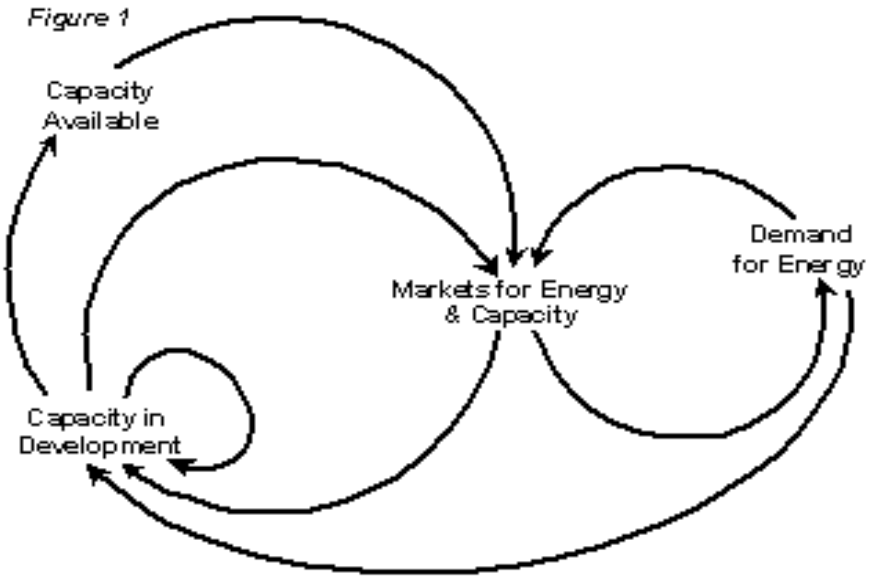
The electric utility industry in the United States is vast, directly employing hundreds of thousands of well-paid workers, and indirectly employing hundreds of thousands more. The industry has been in place for over a century. The regulatory structures that were dismantled in the late 1990s had, in many cases, been in place for over 70 years. It should surprise no one that the retooling of such a vast, complex industry would result in some significant transitional problems. The industry has faced significant problems before, and in most cases was able to work out tolerable means to handle them through appeal to the regulatory compact. But it will not be easy.

## 2. POWER MARKET CYCLES

Electric deregulation at both the wholesale and retail levels has been premised upon the proposition that market forces will produce an economically efficient supply of reliable and affordable electric energy. We certainly agree with the proposition. Yet market supply-demand cycles take time to play out – depending of course on the commodity – and the state of the capacity expansion cycle will have a major effect on prices. The varying conditions that can be observed in commodity markets make it important for the Commission to design terms and pricing for POLR service that can flexibly respond to market conditions. The Commission should also encourage the application of insight and mathematical modeling to understand and anticipate the impact of the structure of POLR service on the retail market and on the finances of potential POLR providers.

Spurred by deregulation, intense market share competition among builders of wholesale generation facilities, and readily available financing, the PJM and other power markets have demonstrated considerable volatility. The market cycle in power generation is similar to those in other capital-intensive commodity industries like aluminum and air travel. This point is elaborated in a recent study by members of PA's Global Energy Practice. The power-market cycle produces pronounced swings in capacity investment, reserve margins and prices for power and capacity. In most US power markets, including PJM, the late 1990s represented the upswing phase of the cycle with attractive market prices, which generated substantial surplus capacity that then caused the capacity aspect of power prices, asset values and capacity development to collapse. Eventually, in PJM as in other regions, rising load and capacity retirements will cause reserve margins to diminish sufficiently to once again trigger rising prices. When prices have risen far enough, capacity investment will resume and the market cycle will have gone full circle.

Like other regional power markets, PJM exhibited cyclical behavior long before deregulation, but then-prevailing regulatory rules and processes substantially reduced the amplitude of its market cycle. Deregulation and liberalization removed those damping effects, causing the amplitude of the market cycle to increase significantly. The real cause of the PJM cycle is in the market feedback loops shown in Figure 1 below. It should be noted that many more feedback loops operate in the PJM market than are shown in Figure 1 – for the sake of clarity only the most important feedback loops are shown there.




Such feedback loops are common to most commodity markets. Some loops involve long delays or lead-times, such as the time required to license and develop a new generating plant. Other feedback loops involve decisions based on uncertain information, as when generators must make capacity-investment decisions without knowing how much previously announced new capacity will actually be developed. The combination of long delays, uncertain information and multiple interconnected feedback loops creates the potential for capacity surpluses and shortfalls that characterize and sustain cyclical market behavior. Deregulation and liberalization increased the amplitude of the PJM market cycle by decentralizing capacity-expansion decision-making and forecasting, by increasing dependence of investment decision-making on current power prices, and by reducing the attention paid to investment decisions made previously by other parties. It is important to remember that deregulation and liberalization did not cause the market cycle – the tendency to cyclical behavior is inherent in any capital-intensive commodity industry with long lead-times.

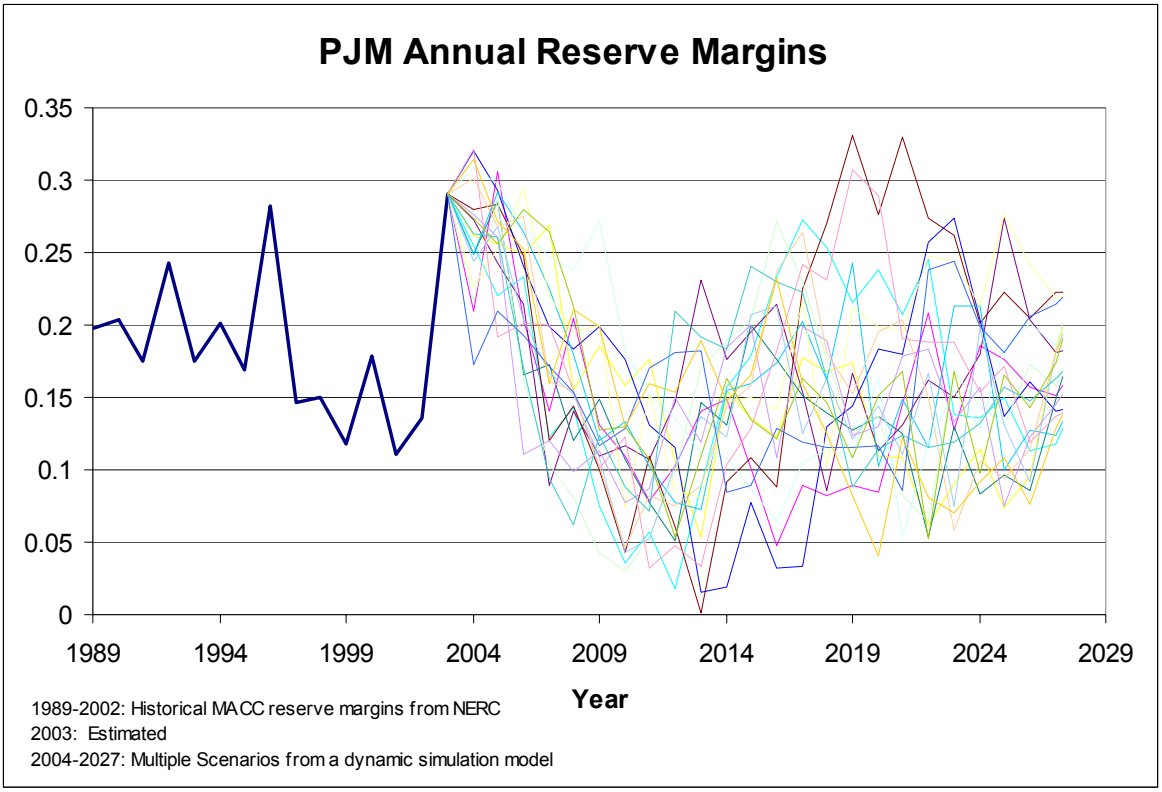
The full market cycle of supply and demand in PJM takes place over a relatively lengthy period – roughly 12 to 14 years – with phases of oversupply (as at present) and undersupply. The duration of the market cycle is a by-product of the underlying market dynamics. During phases of oversupply, with energy more or less freely available, sellers are able to charge little more than their variable costs of production. During periods of undersupply, quite the opposite is true. Over the course of this lengthy market cycle, periods of supply and demand balance are relatively infrequent. Until the excess supply is worked off, it is clear that buyers will place little value on purchases of capacity, be they short term or intermediate term.

To understand the cycle, PA employs a proprietary dynamic computer simulation model of the PJM market. That model replicates in detail the market-driving feedback loops shown in summary form in Figure 1 above. It simulates the disequilibrium conditions driving the market cycle, including capacity surpluses and shortfalls, and the resulting effects of disequilibrium conditions on prices and investment decision-making. Because market uncertainties (such as future fuel prices, load growth rates, plant closures, etc.) can significantly influence cycle

shape and timing, we used the PJM model to simulate multiple scenarios reflecting the likely range of those market uncertainties. Individually, these scenario-based simulations reveal various possible trajectories for the market cycle, and together they show the broad pattern of likely market-cycle behavior in PJM. That pattern is generally similar to market cycles simulated dynamically in other regions including ECAR, NYISO and ISO-NE.

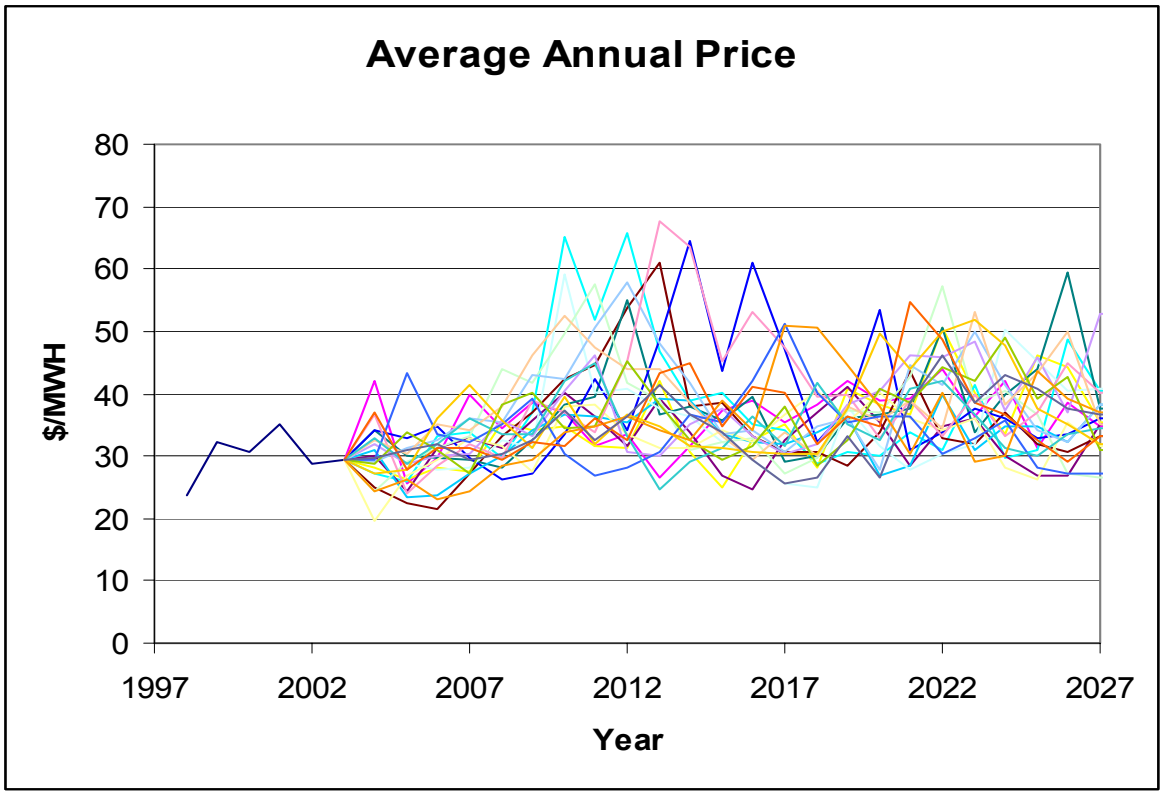
The market cycle affects recovery and mitigation of stranded costs primarily through the capacity element of market prices, and prices move with surpluses and shortages of generation capacity. The latter can be seen in the cyclical movement of reserve margins. Figure 2 below shows reserve margins from multiple scenario-based simulations of the PJM market. Reserve margins fluctuate considerably during the market cycle as capacity surpluses wax and wane. Because of long plant-development lead times, reserve margins swing from oversupply to eventual undersupply from this point in the cycle. Given project lead times of 18-24 months for gas plants and in excess of 3 years for coal facilities, reserve margins can continue to rise for several years after new project initiations cease, as committed plants may complete construction and come on line.

**Figure 2**



Both power and capacity prices fall as reserve margins continue to rise, and the resulting low prices for power and capacity can persist for half or more of the approximate 12-14 year duration of the power-market cycle. As shown in Figure 3 below, PJM is in the low-price portion of its market cycle, so prices can be expected to remain low for some time. This figure illustrates multiple scenarios of a dynamic simulation model, to show the basic uncertainty in prices. It shows multiple scenario-based simulations designed to illustrate the underlying cyclicality of prices, rather than a forecast. In these various simulations, substantial long-term price fluctuations are typical. The scenarios reflect various market uncertainties regarding load growth, fuel prices and the like. These uncertainties significantly alter the shape and timing of the price cycle, yet the persistent nature of the price cycle and its significant amplitude are striking.

**Figure 3**



## 3. RETURN TO POLR SERVICE

Within the longer-term cycle described in the previous section, prices move up or down for various reasons, and customers migrate between competitive and POLR suppliers. POLR supply is truly a “last resort” for customers who cannot find an alternative supplier. Other customers take supply from the POLR provider because they do not care to shop. A third category will take supply from the POLR provider if and when it is economically advantageous to them. These customers are exercising migration options, and the cost and value of such options must be taken into account when designing and pricing POLR service offerings. Customers, who are dropped by their provider for nonpayment, or whose provider exits the market, may also be thought of as exercising an option (or, their provider exercises an option).

There are at least three different migration options associated with POLR service. First, customers on POLR service have an option to leave at any time for an alternative supplier. Second, customers who do shop have the option voluntarily to return to POLR service if market prices spike and are flowed through by their supplier (this appears to be a simple option, exercisable only at the end of a customer’s contract with its supplier, but the POLR would not know the length of those contracts and would have to assume the option is exercisable anytime). Both these options complicate the POLR supplier’s ability to hedge its obligations. Under a traditional “cost causation” approach, the costs of the first option could be bundled into POLR prices but the costs of the second should be assigned to shopping customers. The third option is held by alternative suppliers and will be described below.

In Pennsylvania, the number of alternative suppliers, the volume of power they sell and the numbers of customers they serve have all responded to changes in market prices. When Pennsylvania first introduced retail choice, the shopping credit (cost of POLR service) was set above the wholesale price. The areas with the highest regulated default rates, PECO and Duquesne, also had the highest proportion of customers that selected alternative suppliers. As wholesale prices rose, however, customers switched back to the POLR service; the amount of energy sold by retailers dropped by about 45% from 2000 to 2001.

In June 2000 the Commission modified default service rates to reduce seasonal switching between competitive and default service. The Commission was clearly convinced that consumers react to predictable differentials between regulated and competitive prices. It provides an example of a more general point: the price offered by the POLR supplier and the conditions placed on customer migration can encourage or discourage customer churn.

The third migration option is held by alternative suppliers rather than customers, although it provides the customers a certain amount of insurance. When an alternative supplier exits the market or goes out of business, its customers will return to utility service. Customers can also be dropped by their supplier and returned to utility service if, for example, they fail to pay their bills. If providers are prevented from dropping nonpaying customers, they will exit the market at a higher rate. In Pennsylvania, for instance, 38% of the alternative suppliers left the market between 2001 and 2002. In some cases this happened without warning. Utility.com dropped approximately 30,000 customers when it withdrew from the Pennsylvania retail market.

Customers have been affected by suppliers' poor financial performance in other parts of the nation as well. In Texas, 1,700 Texas Commercial Energy customers were affected when this marketer was recently forced to file for bankruptcy following an ERCOT price spike. Power Direct LLC returned more than 15,000 New Jersey customers to default service in 2001.

In several projects for clients, PA has attempted to price POLR migration options. Depending on the terms and conditions of POLR service and the pricing environment, we have seen option values varying from 0.15 to 0.55 cents/kWh, and it would not be surprising if there were a situation in which the option value would exceed 1 cent/kWh.

Clearly, migration options can have significant costs, reflecting the value they provide to customers and to developing retail markets. POLR pricing and terms of service need to be set taking into account the options that they can create. The POLR provider could charge for those options, or be made whole through some kind of true-up or deferral.

## 4. CONCLUSION

This Commission properly recognizes that reliable, affordable electricity is an absolute necessity for the health, safety and welfare of the citizens of the Commonwealth of Pennsylvania and its economy. Implicit in the Commission's retail electric market program is the right of all electric consumers to acquire electricity from a backstop provider at some point in time, providing that they have the means to pay or are otherwise protected. At issue before the Commission Roundtable are the scope, terms and conditions of POLR service, and the identity and compensation of qualified POLRs, among other matters.

Pennsylvania is one of only a few jurisdictions that have reached the stage of replacing transitional regimes with permanently restructured retail electricity markets. Important decisions must be made about the location and nature of the universal service obligation. The pricing, terms and conditions of POLR service will be key determinants of the long-term success of the retail market.

The universal service obligation carries with it risks of which the Commission must take note. One cannot set a fixed level or formula for POLR pricing because the market will cycle and change, both in general because of the logic of economic behavior and in particular as a response to the Commission's specific actions. Traditional regulatory approaches such as balancing accounts and deferrals cannot be applied to a competitive default service provider.