

Synapse
Energy Economics, Inc.

Procuring Default Service:
Relationships between Contract Duration and
Contract Price

Prepared by:
**Amy Roschelle, William Steinhurst, Paul
Peterson, and Bruce Biewald**
Synapse Energy Economics
22 Pearl Street, Cambridge, MA 02139
www.synapse-energy.com
617-661-3248

Prepared for:
The Maine Office of the Public Advocate

May 21, 2004

Table of Contents

Executive Summary:..... 1

Introduction..... 3

Forward Contracts in Practice 3

Long-Term Cooperative Supplier Relationships 4

Retail Contracts 5

Commodities and Futures Markets..... 6

Long-term Contracts and Financing..... 9

Results from the NJ Auction..... 9

Migration and Other Volume Risks 12

Conclusions..... 13

Executive Summary:

In this paper we consider the relationship between contract duration and contract price for various goods. Specifically, we explore how contract length affects contract prices in general and then, more specifically, with regard to contracts for the procurement of electricity for providing standard offer service for residential and small commercial customers.

In the electricity marketplace, it is often taken for granted that one pays a price premium in order to lock-in to longer-term electricity contracts. However, the origin of this notion is unclear. In any event, this notion does not hold, in general, for either electricity or any other commodity. One key reason for this is that locking into contracts has a benefit, not only for the buyer, but also for the supplier. By having an agreement for the future, the supplier can better plan and manage his/her product/service today, producing significant cost savings that can be shared with buyers. In a competitive solicitation that allowed for long-term contracts, we would expect such sharing to play an important role.

A review of actual market data on the relationship between various commodities and how far into the future the buyer is willing to commit shows that purchases farther out in time often, perhaps usually, are priced noticeably lower than purchases commencing immediately. Commodities showing such a declining term structure currently include milk, Euro dollars, pork, and natural gas. Coffee is a counter example, most likely due to known shortfalls in near term harvests and rising demand.

In a wide variety of industries, a mix of various term lengths for contracts is a hallmark of purchasing management. We see this in food processing, computer manufacturing, the automotive industry, and many others. Such a mix allows buyers to benefit from risk reductions afforded sellers. Default service electricity suppliers and regulators should capture such benefits on behalf of default service customers.

In addition, recent trends toward long-term, cooperative supply relationships in some industries, such as automobile manufacturing, have produced surprising additional savings because suppliers (and *their* upstream suppliers) have sufficient confidence to innovate and invest for the benefit of buyers. We believe comparable benefits can be acquired through long-term unit or fleet purchases of new renewable power production. Default service electricity suppliers and regulators should also seek to capture these benefits on behalf of default service customers.

In sum, we conclude that:

- I. There is no support in theory or practice for the notion that longer contract durations result in higher prices. On the contrary, there are reasons to believe that, in many circumstances, longer contracts yield lower prices.
- II. Empirical evidence in electricity markets fails to demonstrate the existence of a significant and validly comparable price premium for longer-term contracts. Where such a price premium exists, it may be small and could be outweighed

by the benefits that parties receive through the use of a laddered contract approach.

- III. While customer migration risk is a legitimate concern in determining contract prices, prospects for significant residential switching in Maine are small, and can be mitigated through sound portfolio management.

Introduction

In the electricity marketplace, it is often taken for granted that one pays a price premium in order to lock-in to longer-term electricity contracts. However, the origin of this notion is unclear. Perhaps this belief stems from the 1980's when there were expectations that fossil fuel prices were on the rise. This expectation caused longer-term contracts to be more costly than shorter-term contracts. There was also a period, in the mid-1990's, when there were great uncertainties regarding market restructuring so that generators were reluctant to enter into long term fixed price contracts.¹ Again, this led to higher prices for such longer-term contracts as were available. Perhaps either or both of these past situations led to the general belief that longer-term contracts for electricity inherently carry a price premium. However, such a notion, from both a theoretical and an applied standpoint, does not hold in general for either electricity or any other commodity. The reason for this is that locking into contracts has a benefit, not only for the buyer, but also for the supplier. By having an agreement for the future, the supplier can better plan and manage his/her product/service today. For example, when a revenue stream adequate to cover costs is guaranteed through a long-term contract, the electricity generator can lock into more favorable financing arrangements, sign long-term contracts for inputs, build plants based on demand, determine where to locate plants based on end-customer location, etc. All of this results in lower costs for the supplier. If the supplier shares some of these savings with the buyer, as may be expected in a competitive RFP, then both parties win. Below, we examine such situations along with traditional supplier contracts.

Forward Contracts in Practice

Generally, buyers acquire a mix of long- and short-term contracts. The goal is for the buyer to find the optimal trade-off between price and flexibility. In other words, the buyer needs to find the appropriate balance of low price, yet low flexibility (such as long-term contracts), reasonable price but better flexibility (such as option contracts), or unknown price and supply but no commitment (the spot market.)

As an example, consider how manufacturing companies look at forward contracts. Traditionally, they have signed forward contracts of varying lengths with suppliers of critical commodities. Their detailed decisions about how and when to rely on traditional forward contracts revolve around the current and expected future directions of market prices, the volatility of the market, and how soon a market direction change is expected. For both buyers and sellers, forward contracts guarantee the transaction of a known quantity of goods at a known price and for a given time frame. From the buyer's

¹ We do not claim that regulatory and market changes are a thing of the past, but today's structural and regulatory uncertainties in wholesale markets are much reduced from those of the mid-1990s, when even the most basic issues of market design were in great turmoil. We also contend that recent increases in the prices for natural gas and electricity are unlikely to continue on an upward path for the indefinite future. Therefore, these increases will be time-limited.

perspective, such a contract not only guarantees delivery of a critical good, at an agreed upon price, but also reduces the costs of procurement operations, as prices do not have to be negotiated continually.

In general, the contract lengths selected depend on the lifecycle of the industry and product. For example, in the pork industry, the type of product and product specifications (quality, delivery points, lot sizes, etc.) might be considered constant, and demand can be easily forecasted. As a result, hog cash contracts typically have durations of 3 to 7 years.² In faster life-cycle product companies, such as Intel, contracts are negotiated anywhere from every quarter to every several years. For example, with regard to CPU processors whose designs and even fundamental technologies can become obsolescent in only a few years, multi-year contracts are typically avoided.³ Electricity, as a commodity, has fairly constant quality and definition, and demand can be well forecasted.⁴ In other words, electricity can be viewed as a commodity with a long product life-cycle. Contract durations of 3-10 years would therefore seem reasonable for electricity.

Long-Term Cooperative Supplier Relationships

One trend in industrial purchasing is a decrease in the number of suppliers and an increase in longer-term contracts and cooperative supplier relationships. This trend argues for the view that buying for the long-term, delivers value that benefit buyers. We believe this trend provides useful insights for default electric service provision.

Leading firms like Honda, Wal-Mart, Harley-Davidson, Toyota, and American Airlines have found that suppliers can be a valuable resource in their ability to contribute creatively to cost reductions, product development, logistics operations, and increasing their bottom line. Buyers have also begun to acknowledge that suppliers must achieve profit margins sufficient for them to invest in new technologies, facilities, equipment, and people. In order to achieve this, both parties are beginning to make their cost structures and margins more transparent.

Chrysler Corporation is one of the greatest success stories in restructuring process and relational contracts with suppliers of key commodities. Traditionally, Chrysler designed products largely without input from suppliers. The Company chose suppliers solely on the basis of price through a competitive bidding process, and Chrysler dictated the terms of all contracts and limited their duration to two years.

In a major turnaround, since 1994 Chrysler has implemented a program to reduce company costs without hurting supplier profits. Chrysler now deeply involves suppliers

² Wellman, Allen C., "Hog Cash Contracts Advantages and Disadvantages," Nebraska Cooperative Extension NF 96-280, <http://www.ianr.unl.edu/pubs/farmmgmt/nf280.htm>

³ Neustadt, Martha of Intel Corporation's Materials Department. Conversation dated 5/21/2003.

⁴ Market rules and definitions of capacity and ancillary products are a concern in this regard, but appear to be becoming more stable; electric energy as a commodity delivered to market is, for purposes of this discussion, reasonably stable in definition.

in its processes and strives to find ways to lower costs together. Suppliers are now involved in the development stage of vehicles 180 weeks prior to volume production versus 75-100 weeks as in the past. Contract times more than doubled to 4.4 years on average. Suppliers are expected to offer suggestions that result in cost reductions equaling 5% of the supplier's sales to Chrysler. As a reward, Chrysler not only gives suppliers 90% of the business for the life of each car model through oral agreements, but also gives a percentage of all implemented savings back to the supplier.

For their part, suppliers have demonstrated their trust in Chrysler by increasing their investments in dedicated Chrysler assets – plants, property, equipment and people. Results have been impressive. Chrysler has reduced the development, design and retooling time for its new vehicles from 234 weeks in the 1980's to 160 weeks. Development costs have plummeted 20-40%. In its first two years, Chrysler's new strategy generated 875 ideas from suppliers worth \$170 million in annual savings. As of December 1995, the Company had implemented 5300 ideas that have generated more than \$1.7 billion in annual savings for the company alone.⁵

The example of cooperative supplier relationships in manufacturing is relevant to several aspects of default service provision of electricity. From these industrial examples, we see that buyers can achieve significant savings in direct costs, overhead, and transaction costs by procurement strategies that offer vendors longer commitments. As discussed elsewhere in this paper, developers of new renewable generators could provide better prices and insulation from fossil fuel prices over many years as a result of such a purchasing environment. Consider a renewable energy developer who, based on an agreement with a default service provider, knew that a certain number of wind turbines could be ordered every year for five years. That developer could follow Chrysler's example and seek R&D driven enhancements and cost reductions from equipment vendors. Under such an environment, non-renewable generators might be able deliver power with reduced transmission costs and reduced losses. Even purely market-based wholesale suppliers could afford to invest in a better portfolio, as well as better management tools and practices, in response to such an environment. The upstream opportunities just mentioned in connection with renewable energy developers could apply here as well.

Retail Contracts

In retail markets, there are many instances where consumers get a better deal if they lock-in to a future contract for a product or service. For instance, when shopping for an airline ticket, a traveler can most often get a better deal by booking a flight a couple of months in advance rather than waiting to purchase a ticket until three weeks prior to the flight date.⁶ The price difference can be significant; it would not be unusual for the person who

⁵ Dyer, Jeffrey, "How Chrysler Created an American Keiretsu," Harvard Business Review, 1996.

⁶ We have experienced such savings ourselves. This effect is different from the price change that occurs when "supersaver" fares become unavailable in the last two weeks before a flight date. By that time, airline equipment and crew commitments are relatively fixed and simple short run supply and demand issues dominate fare-pricing.

purchases three-weeks prior to departure to pay 30-40% more than the person who purchased a ticket for the same flight two-months ahead. In fact, the fare difference far exceeds the time value of money that the buyer loses by purchasing early. What is interesting about all of this is that everybody on the flight gets to and from the same locations at the same time, regardless of the fact that they have all likely paid quite different prices based on the date they purchased their tickets. Yet, those who purchase earlier are often rewarded with a lower fare, since, by committing to purchase the ticket, they assure the airline that customers are going to be interested in the flight. Through the early “contract” commitment, suppliers receive the advantage of having information that helps them plan - operationally, financially, and strategically.

This situation is also relevant in terms of home heating oil. Those customers who sign advanced contracts with oil delivery suppliers typically get better prices than those who order shortly before they need their tanks to be refilled. As in the airline example, the good is still the same whether the homeowner locks into the contract now or later. It is simply the price that varies.

Commodities and Futures Markets

For many commodities, we see a similar trend in the futures markets: the further away the delivery date, the lower is the current contract price.

In the graph below, we see that for milk, the euro dollar, and pork, prices decline as a function of contract start date. What does this indicate? While there may be unique circumstances for each of these individual commodities and industries that might explain the declining prices, a general explanation might be that by locking into contracts now, both the suppliers and buyers are forging an agreement for the future. This agreement can reduce risks for both sides. The supplier is assured that somebody is going to purchase his/her good at a profitable price, and the buyer is assured that his/her demand can be met on the date that it is needed at an affordable price. For both parties, risk is therefore reduced and prices can be lower.

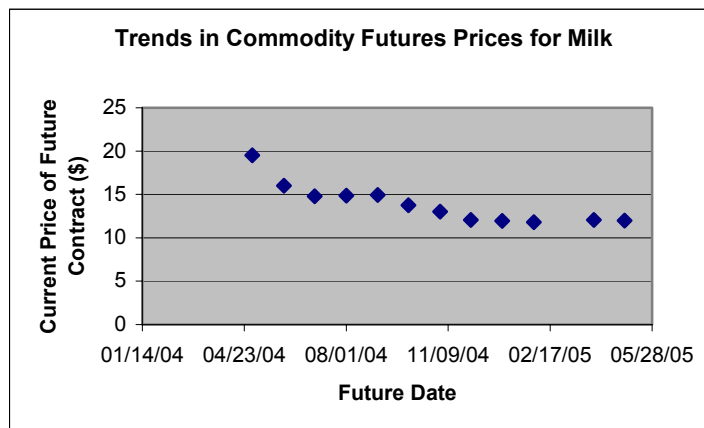


Figure 1: Trends in Commodity Futures Prices for Milk. Source: Chicago Mercantile Exchange. Settlement prices as of 05/03/04.

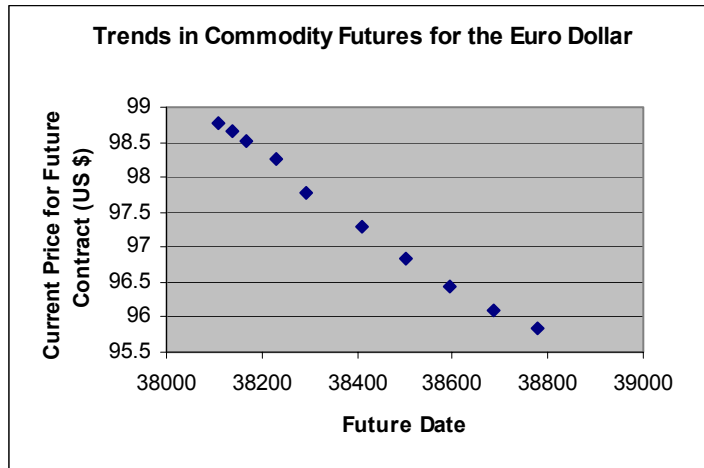


Figure 2: Trends in Commodity Futures Prices for the Euro. Source: Chicago Mercantile Exchange. Settlement prices as of 04/30/04.

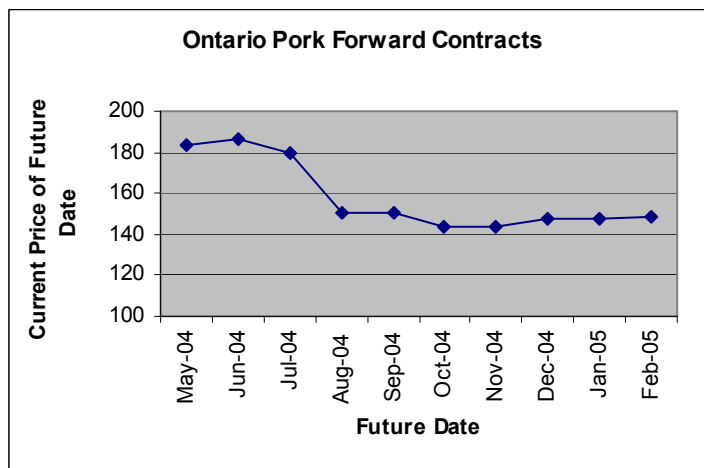


Figure 3: Trends in Commodity Futures Prices for Pork. Source: Ontario Pork. Settlement prices as of 04/30/04.

There are, however, some exceptions to the above findings. For example, both coffee and cocoa are currently priced higher for contracts farther out into the future. For coffee, this is based on the current expectation of lesser crop volume in top-grower Brazil, slower exports from Central America, and consumption growth forecasts.⁷ When looking at such a result, it is important to consider the following: coffee only grows in a limited number of regions, there is no substitute, and crop success is highly sensitive to weather conditions.

⁷ http://story.news.yahoo.com/news?tmpl=story&cid=568&ncid=749&e=4&u=/nm/20040412/bs_nm/markets_coffee_prices_dc

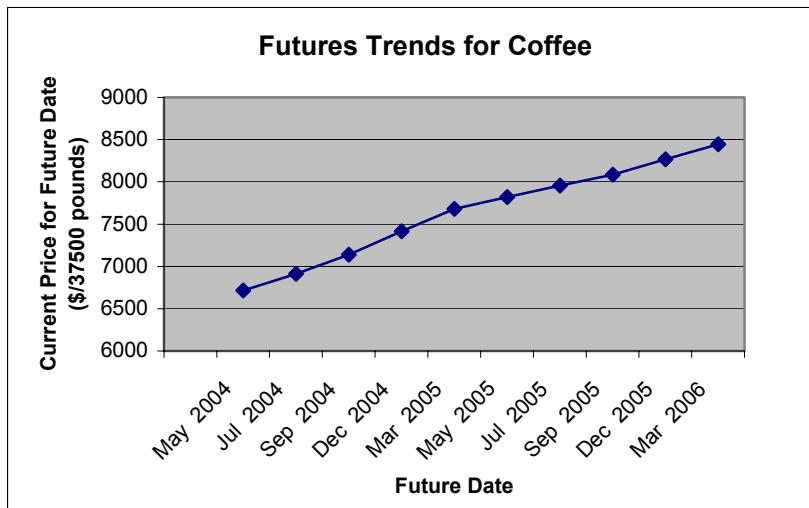


Figure 4: Trends in Commodity Futures Prices for Coffee. Source: New York Board of Trade. Settlement prices as of 05/03/04.

So, what do electricity futures look like? Unfortunately, sources of such information on electricity futures are few and far between. The electricity futures market, though growing, is currently only thinly traded. However, since natural gas prices currently drive electricity prices, it makes sense to look at natural gas price futures, which are actively traded.

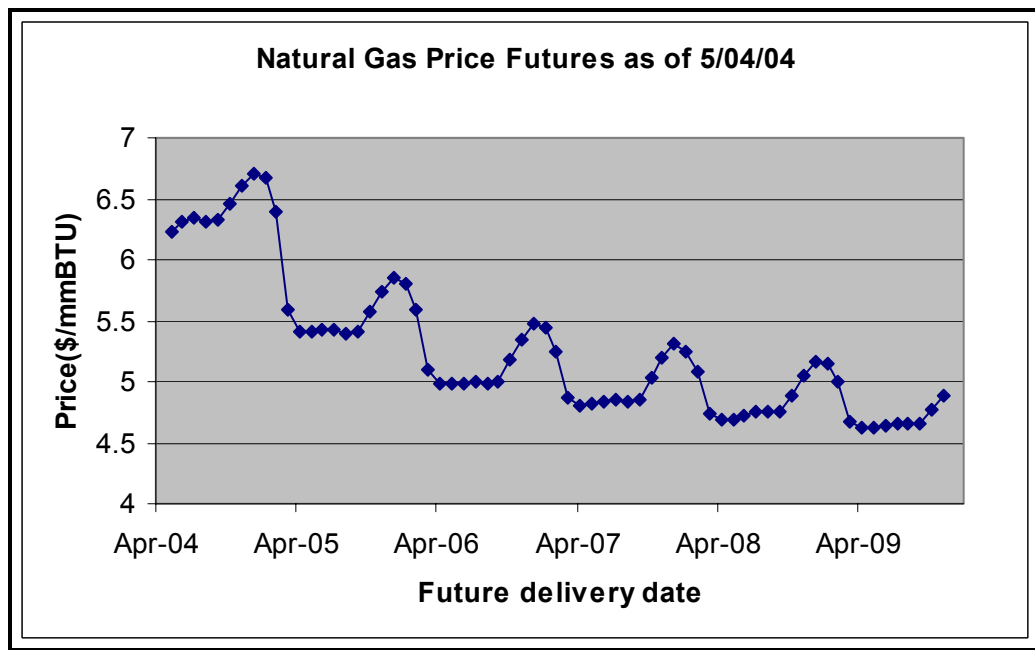


Figure 5: Trends in Commodity Futures Prices for Natural Gas. Source: New York Mercantile Exchange. Settlement prices as of 05/04/04.

Here, we see that natural gas price futures, though cyclical, currently decline in price as a function of lead-time. From this, we conclude that longer-term contracts for gas, and presumably for electricity as well, should not result in higher prices than shorter-term contracts. At times, expected *future* supply or demand imbalances may overshadow these effects, but the general finding should hold.

Long-term Contracts and Financing

Another perspective on buying now for the future is provided by the retail market for cellular phone plans. Anyone who has shopped for cellular phone service knows that a better price is most always offered for a 2-year versus a one-year contract. The reason is that under a 2-year contract, the supplier is assured a customer for a certain period of time. As a result, the supplier can assure shareholders and financial lenders a more stable revenue source. Financially and strategically, this is advantageous for the supplier. The buyer, through discounts, is compensated for the risk of locking in to the longer contract. In effect, both parties win.⁸

This same argument can be used for renewable sources of electricity, like wind. Renewables have some advantages over fossil fuel generation. For instance, some are especially powerful at reducing peak prices.⁹ However, wind projects are capital intensive and require project financing. Without longer-term contracts in place, wind owners do not have a stable revenue source, and find it difficult to get financial institution backing for projects. This situation would be reversed with longer-term contracts in place for default service. The owner, assured a constant revenue stream at a level that covers costs and profit margin, would get better financing from lenders. These savings could be shared with buyers, as would be expected in a competitive RFP process. The consequence: everybody wins. The wind owner builds more wind farms, and buyers get reduced prices.

Results from the NJ Auction

The State of New Jersey has been quite proactive in moving towards a laddered approach for the procurement of its default service–basic generation service (BGS). To achieve

⁸ It may be that lower prices are available from other providers in the future. However, in the electric industry, by laddering contracts, one can both capture these lower future prices and diminish price volatility. The risk of locking-in when the market is high is greatly diminished through a laddered approach.

⁹ See, for example, William B. Marcus and Greg Ruzsovan 2000. *Mid-Atlantic States Cost Curve Analysis*. JBS Energy, Inc. Dec. 5. This study analyzed the market price of electricity in the PJM region in order to determine the value of photovoltaic (PV) load reduction. (Marcus and Ruzsovan 2002) The estimated value of PV load reduction during the on-peak hours during that summer season was over 27 cents/kWh in the PJM (4.8 times the market price calculated) and roughly 8.1 cents/kWh during summer mid-peak hours. PV's summer on-peak load reduction value may very well be equal to or exceed the levelized cost of electricity from PV panels. This effect is thought to be especially pronounced in unhedged markets.

this, NJ has phased in longer-term contracts. In 2002, when NJ started the auction process, it procured only 1-year contracts for electricity for basic generation service for residential and small commercial customers. Then, in both 2003 and 2004, NJ held auctions for the provision of both 1-year and 3-year contracts for default service. The auction design and results are shown below.

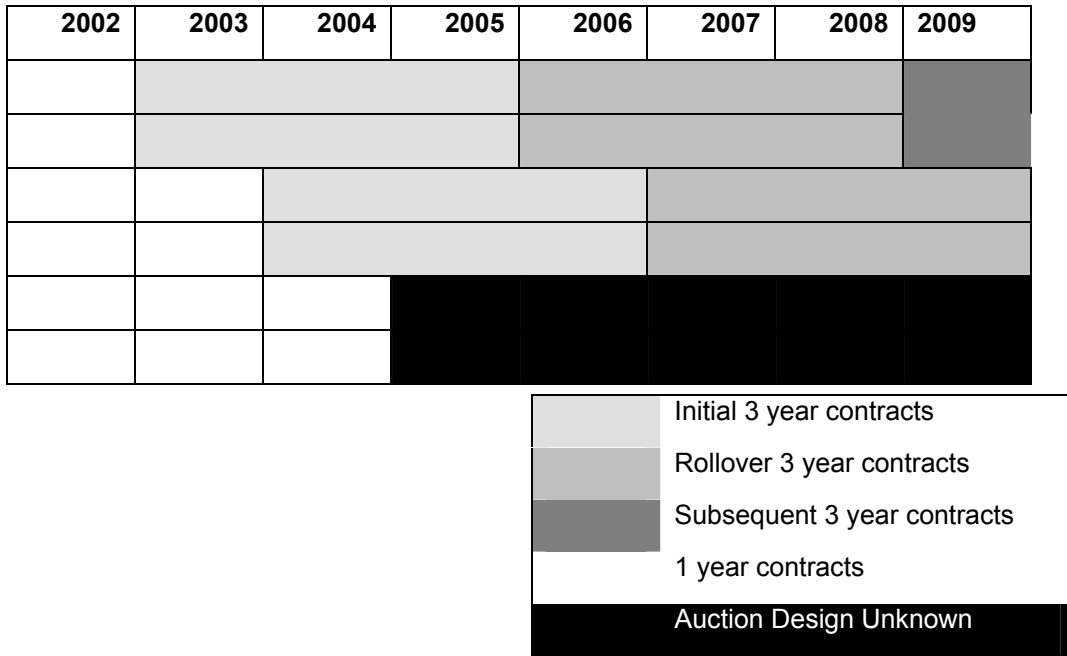


Figure 6: NJ BGS Auction design. NJ is phasing in long-term contracts and a laddering approach.

Table 1 shows that there is price difference between the 1 and 3-year contracts, albeit rather small in 2004 for most utilities. The 3-year contracts are indeed more expensive than the 1-year contracts. But can one really compare a 1-year contract directly to a 3-year contract and conclude that the use of the longer contracts for default service will carry a premium over time compared to the use of one-year contracts? Not necessarily. What one should really be looking at is the price difference between a series of one-year contracts and 1 three-year contract for the same time period. Below, we see an illustrative, hypothetical example.

Table 1: NJ BGS auction for fixed price basic generation service contracts. There is an apparent price difference between the 1 and 3-year contracts. But comparing the two directly is like comparing apples to oranges.

		<u>10 month or 1 year contract price (cents/kWh)</u>	<u>34 or 36 month contract price (cents/kWh)</u>	<u>% difference between 1 and 3 year contract</u>
2003	PSEG	5.386	5.56	3.23
	JCPL	5.042	5.587	10.81
	ACECO	5.26	5.529	5.11
	RECO	5.557	5.601	0.79
2004	PSEG	5.479	5.515	0.66
	JCPL	5.325	5.478	2.87
	Conectiv	5.473	5.513	0.73
	Reco	5.566	5.597	0.56

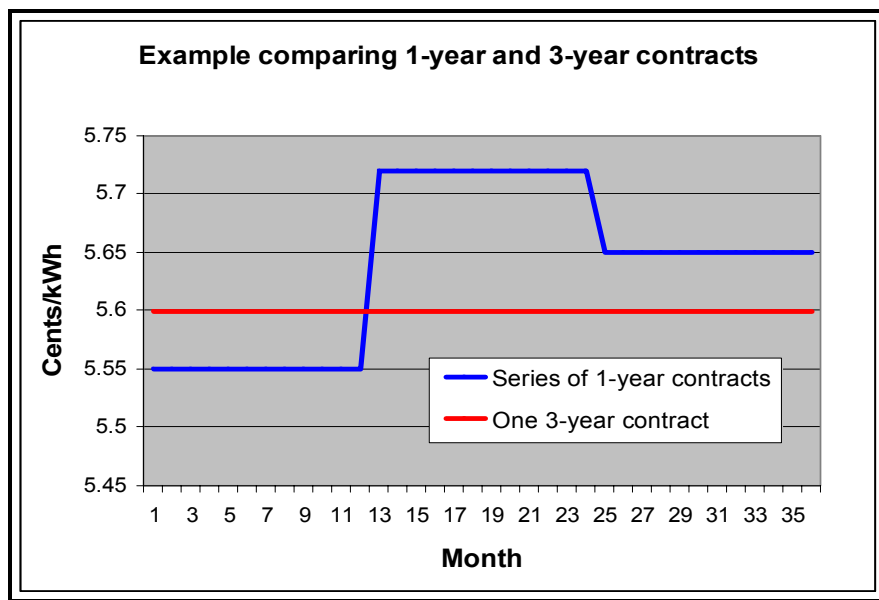


Figure 7: Hypothetical prices for a 3-year contract signed in Year 1 and for one-year contracts signed in Years 1, 2, and 3.

Suppose, for example, we had started up a 3-year laddering strategy and the available prices for one-year and three-year contracts in Year 1 were as shown in Figure 7. And suppose, further, that the one-year contract prices in Years 2 and 3 happen to have moved as shown in Figure 7, as well. In Year 1, we might have been tempted to choose a strategy of meeting 100% of need with one-year contracts, since their price was less than the three-year contract price. However, this did not mean that there was necessarily a price premium for the three-year contract. For example, if the one-year contracts had followed the hypothetical track shown in Figure 7, their average price over Years 1, 2, and 3 would have been higher than for the 3-year contract signed in Year 1. In other

words, just because Year 1 showed a price difference between the two options that does not ensure that over the three-year time frame there is a price premium. One cannot simply look at the current 1-year contract in isolation and conclude that it is more advantageous than a 3-year contract. In order to determine if a price premium exists, one has to compare the two scenarios over a similar time horizon.

It is also interesting to note (Table 1) that even if there is a price premium for the longer-term default service contracts in New Jersey, the premium seems to have diminished in the second auction to a relatively small amount. And this amount is very likely to be offset by the financial benefits (price stability) that consumers receive from longer-term contracts.

Migration and Other Volume Risks

If the 80's and 90's had their risks, perhaps the risk of the early 2000's lies in volume and migration risks. Currently an asymmetry exists. Default service suppliers are generally required to provide a fixed price offer to all comers, but default service customers can walk away by choosing a competing supplier or can vary their purchase amount at will. Thus, only one of the two parties, the supplier, is truly locking in to a contract. With respect to the issue at hand, this means that default service suppliers (usually incumbent electric utilities) have demanded similar fixed-price all-requirements bids from wholesale suppliers in auctions. This creates a genuine risk for those bidders that may be reflected in their offer prices.

However, no US state currently has more than 10% of residential customers switching away from their default service provider, and there is no evidence that this trend is likely to change in the next 1-5 years. In other words, the risk of large numbers of customers migrating away is relatively small. Weather fluctuations can also affect default service volumes, as do economic trends, sometimes powerfully.

Migration risk can and should be managed today by using a laddering procurement approach. Default service auctions typically solicit bids for all (or a certain percentage) of the default service load, whatever that amount turns out to be. This approach passes migration and other volume risks on to wholesale suppliers. The cost of that risk (and, hence, suppliers' expected bid prices) can be reduced by laddering the acquisition of contracts. In other words, instead of locking into a longer-term contract for 100% of the current load today, a wholesale supplier would be more secure financially with only one or a few staggered, partial commitments over time, procuring a certain percentage of forecasted load in each procurement cycle. Alternatively, a laddered approach to procurement allows default service providers to eliminate these volume risks for their wholesale suppliers (thereby reducing the expected prices) by soliciting bids for fixed amounts of power, say by using five slices, each for 20% of the expected load. Of course, that would leave the default service provider with the volume risk, albeit greatly reduced by the laddering. The default service provider could accept this risk, hedge it directly (say, with weather futures or electricity options where available), or essentially eliminate it by committing a portion of the expected load to the spot market and truing up any price fluctuations. Many combinations and variations on this strategy could be imagined. The

fundamental point is that volume risk is low for default service and can be managed in various ways if a laddered, diverse, flexible portfolio approach is permitted.

In addition, it is important to realize that individual wholesale suppliers need to (and can) actively manage for migration risks. The suppliers that are good at this are the ones that can charge a small premium for the longer-term contracts. These are the suppliers who will win the competitive bid processes.

Conclusions

In regard to whether or not there is a price premium for longer-term contracts, we conclude that:

- I. There is no support in theory or practice for the notion that longer contract durations result in higher prices. On the contrary, there are reasons to believe that, in many circumstances, longer contracts yield lower prices in real dollars, since through longer commitments, some risks are diminished for both parties.
- II. Empirical evidence in electricity markets fails to demonstrate the existence of a significant and validly comparable price premium for longer-term contracts. One example is the result of the recent New Jersey basic generation service auctions. While the three-year contracts cost consumers a bit more, this result in no way proves that three-year contracts are more expensive than one-year contracts. To make a true comparison, we would need to be able to compare a series of 3 one-year contracts to 1 three-year contract. In any case, if a price premium exists for longer-contracts, the New Jersey results indicate that the price premium is small and is likely outweighed by the benefits that parties receive through use of a laddered approach.
- III. While customer migration risk is a legitimate concern in determining contract prices, we believe that the prospects for significant residential switching in the next five-year time frame are quite small. Further, any risk that this might impose can be mitigated through use of one or another variation on a laddered procurement approach, wherein for each year, only a fraction of the default service load is procured.