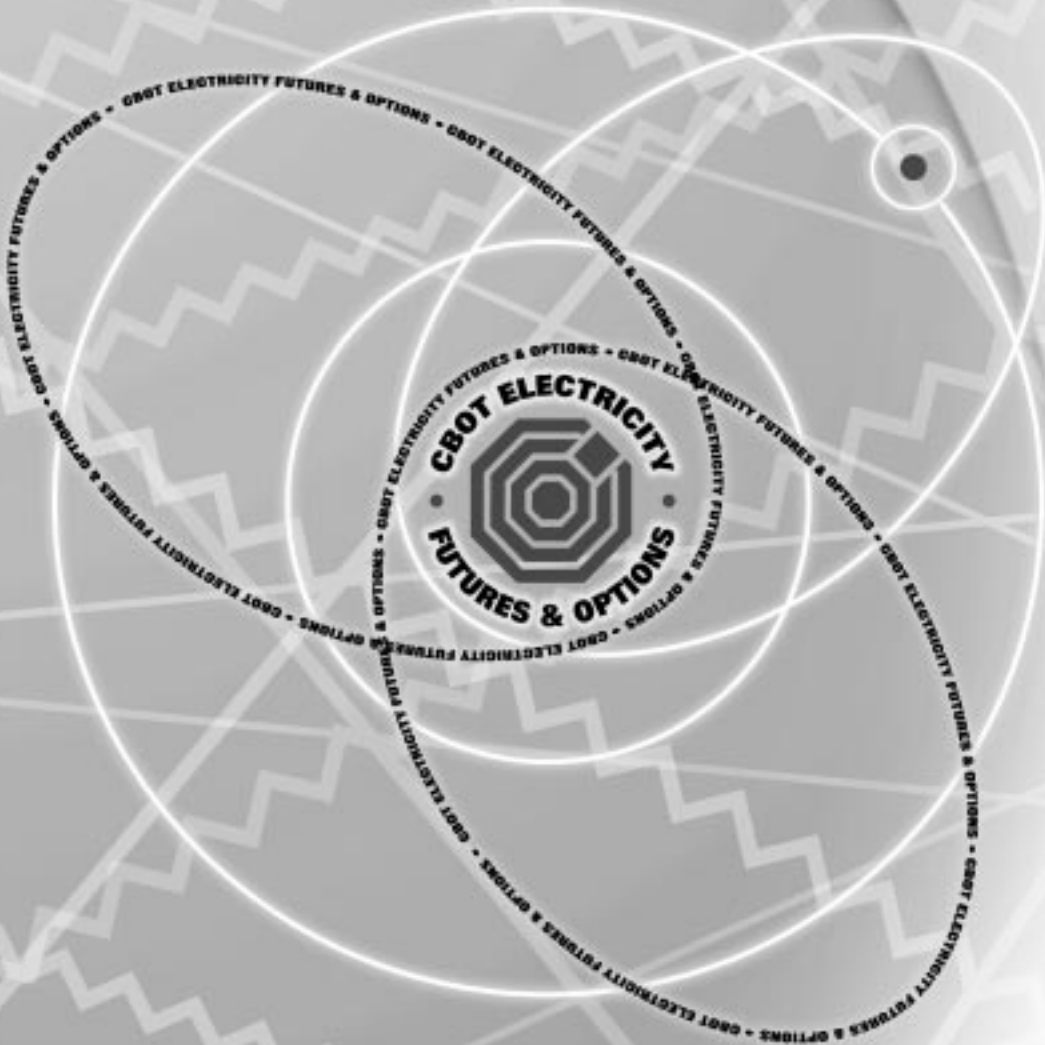


ComEdSM and TVA Hub Electricity Futures and Options: The Reference and Applications Guide



**CBOT[®] Electricity Futures and Options
Reference and Applications Guide**

Introduction

The introduction of the Chicago Board of Trade (CBOT®) ComEd^K Hub and CBOT TVA Hub Electricity futures and options contracts will provide the electricity industry with the means to manage the risks associated with a volatile cash market. These standardized contracts will provide price transparency and liquidity to potential wholesale market users such as utilities, power producers, power marketers, industrial companies, and municipalities, along with exchange locals and speculators. Whether you are a trader seeking to benefit from variation in electricity prices, or a hedger seeking to offset the risks of price uncertainty, electricity futures and options are designed to enhance the way you do business.

This *Reference and Applications Guide* contains a number of examples to show how you can use these new instruments. In addition, it:

- a) provides salient features of the contracts,
- b) describes the underlying cash market and its participants, and
- c) illustrates applications of both the ComEd Hub and TVA Hub Electricity futures and options on futures contracts.

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Part 1

Salient Features

CBOT® ComEdK HUB ELECTRICITY FUTURES
SALIENT FEATURES

<i>Trading Unit</i>	1,680 megawatt hours (MWh)
<i>Price Basis</i>	U.S. dollars and cents per megawatt hour
<i>Tick Size</i>	\$0.01 (1¢) per MWh (\$16.80 per contract)
<i>Daily Price Limits</i>	The maximum permissible price fluctuation in any one day shall be \$7 per MWh above or below the preceding day's settlement price for any month succeeding the nearby trading month. Price limits are removed for the nearby trading month.
<i>Trading Hours</i>	8:00 a.m.-2:40 p.m., Chicago time
<i>Contract Months</i>	Monthly: number of listed contracts subject to determination by CBOT Board of Directors
<i>Opening/Closing Procedure</i>	Simultaneous
<i>Position Limits</i>	Subject to determination by CBOT Board of Directors
<i>Reportable Position</i>	25 contracts (in any one month)
<i>Last Trading Day</i>	Trading will terminate on the fourth business day prior to the first calendar day of the delivery month
<i>Delivery Location</i>	Commonwealth Edison's Control Area
<i>Delivery Rate</i>	5 MW
<i>Delivery Times</i>	Every on-peak hour (6:00:01 a.m. through 10:00:00 p.m., Chicago time) for all on-peak days of the delivery month
<i>Delivered Power</i>	Amount depends on the number of on-peak days in the delivery month: 1,520 MWh for delivery months with 19 on-peak days 1,600 MWh for delivery months with 20 on-peak days 1,680 MWh for delivery months with 21 on-peak days 1,760 MWh for delivery months with 22 on-peak days 1,840 MWh for delivery months with 23 on-peak days
<i>Scheduling</i>	Buyer and seller must follow prevailing Mid-America Interconnected Network (MAIN), ComEd Control Area, and FERC scheduling practices
<i>Ticker Symbol</i>	BZ

CBOT® ComEdK HUB ELECTRICITY OPTIONS ON FUTURES
SALIENT FEATURES

<i>Trading Unit</i>	One CBOT ComEd Hub Electricity futures contract
<i>Price Basis</i>	U.S. dollars and cents per megawatt hour
<i>Tick Size</i>	\$0.005 ($\frac{1}{2}\text{¢}$) per MWh (\$8.40 per contract)
<i>Daily Price Limits</i> MWh succeeding trading month.	The maximum permissible price fluctuation in any one day shall be \$7 per above or below the preceding day's settlement price for any month the nearby trading month. Price limits are removed for the nearby
<i>Trading Hours</i>	8:00 a.m.-2:40 p.m., Chicago time
<i>Contract Months</i>	Monthly: number of listed contracts subject to determination by CBOT Board of Directors
<i>Opening/Closing Procedure</i>	Simultaneous
<i>Position Limits</i>	Subject to determination by CBOT Board of Directors
<i>Reportable Position</i>	25 contracts (in any one month)
<i>Last Trading Day</i>	Trading will terminate at noon on the fifth business day prior to the first calendar day of the delivery month
<i>Strike Prices</i>	Multiples of one dollar (\$1.00) per MWh
<i>Exercise</i>	Any business day that the option is traded
<i>Expiration</i>	Unexercised in-the-money options will be automatically exercised after the close on the last day of trading
<i>Ticker Symbols</i>	BZP, BZC

CBOT TVA HUB ELECTRICITY FUTURES
SALIENT FEATURES

<i>Trading Unit</i>	1,680 megawatt hours (MWh)
<i>Price Basis</i>	U.S. dollars and cents per megawatt hour
<i>Tick Size</i>	\$0.01 (1¢) per MWh (\$16.80 per contract)
<i>Daily Price Limits</i>	The maximum permissible price fluctuation in any one day shall be \$7 per MWh above or below the preceding day's settlement price for any month succeeding the nearby trading month. Price limits are removed for the nearby trading month.
<i>Trading Hours</i>	8:00 a.m.-2:40 p.m., Chicago time
<i>Contract Months</i>	Monthly; number of listed contracts subject to determination by CBOT Board of Directors
<i>Opening/Closing Procedure</i>	Simultaneous
<i>Position Limits</i>	Subject to determination by CBOT Board of Directors
<i>Reportable Position</i>	25 contracts (in any one month)
<i>Last Trading Day</i>	Trading will terminate on the fourth business day prior to the first calendar day of the delivery month
<i>Delivery Location</i>	Tennessee Valley Authority's Control Area
<i>Delivery Rate</i>	5 MW
<i>Delivery Times</i>	Every on-peak hour (6:00:01 a.m. through 10:00:00 p.m., Chicago time) for all on-peak days of the delivery month
<i>Delivered Power</i>	Amount depends on the number of on-peak days in the delivery month: 1,520 MWh for delivery months with 19 on-peak days 1,600 MWh for delivery months with 20 on-peak days 1,680 MWh for delivery months with 21 on-peak days 1,760 MWh for delivery months with 22 on-peak days 1,840 MWh for delivery months with 23 on-peak days
<i>Scheduling</i>	Buyer and seller must follow prevailing Southeastern Electric Reliability Council (SERC), TVA Control Area, and FERC scheduling practices
<i>Ticker Symbol</i>	BA

CBOT TVA HUB ELECTRICITY OPTIONS ON FUTURES
SALIENT FEATURES

<i>Trading Unit</i>	One CBOT TVA Hub Electricity futures contract
<i>Price Basis</i>	U.S. dollars and cents per megawatt hour
<i>Tick Size</i>	\$0.005 ($\frac{1}{2}\text{¢}$) per MWh (\$8.40 per contract)
<i>Daily Price Limits</i>	The maximum permissible price fluctuation in any one day shall be \$7 per MWh above or below the preceding day's settlement price for any month succeeding the nearby trading month. Price limits are removed for the nearby trading month.
<i>Trading Hours</i>	8:00 a.m.-2:40 p.m., Chicago time
<i>Contract Months</i>	Monthly: number of listed contracts subject to determination by CBOT Board of Directors
<i>Opening/Closing Procedure</i>	Simultaneous
<i>Position Limits</i>	Subject to determination by CBOT Board of Directors
<i>Reportable Position</i>	25 contracts (in any one month)
<i>Last Trading Day</i>	Trading will terminate at noon on the fifth business day prior to the first calendar day of the delivery month
<i>Strike Prices</i>	Multiples of one dollar (\$1.00) per MWh
<i>Exercise</i>	Any business day that the option is traded
<i>Expiration</i>	Unexercised in-the-money options will be automatically exercised after the close on the last day of trading
<i>Ticker Symbols</i>	BAP, BAC

Part 2

CBOT Electricity Futures and Options

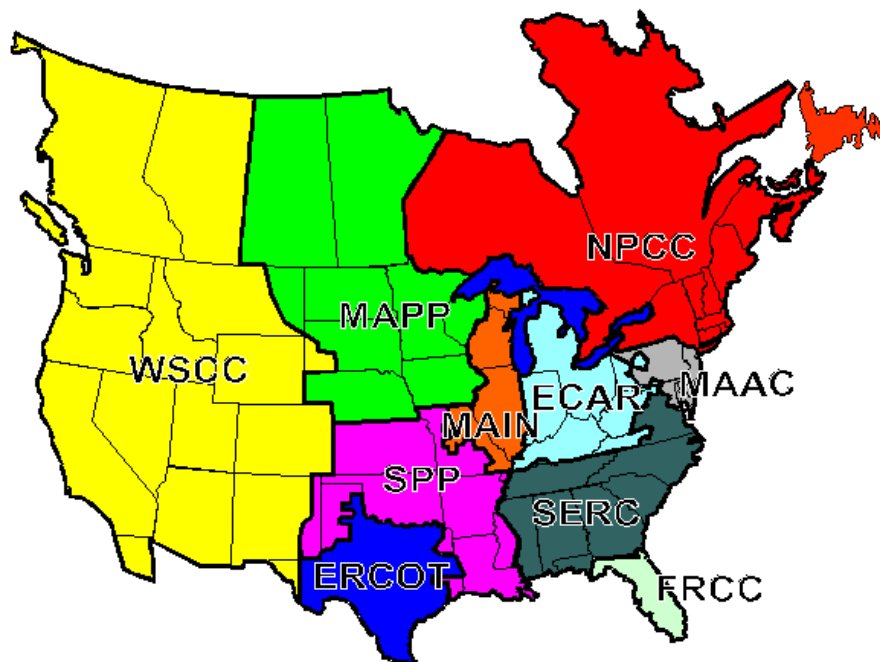
CBOT ELECTRICITY FUTURES AND OPTIONS CONTRACTS

Underlying Electricity Cash Market

The electricity market, based on annual investor-owned utility revenues, is an estimated \$200 billion cash market that trades in dollars and cents per megawatt hour (MWh). This \$200 billion market is divided into a \$53 billion wholesale market, a \$40 billion industrial market, and a \$107 billion retail, or residential, market.

The growth of the \$53 billion wholesale power market can be attributed to regulatory, economic, and technology changes. Recent regulatory actions have ensured that utilities and bulk power traders, such as power marketers, will have access to the transmission services owned and operated by individual utilities. These actions provide buyers access to a multitude of suppliers. Active trading centers for wholesale power have developed at major interconnection points, such as the ComEd and TVA Hubs, and at major generation facilities connected to a number of high-voltage transmission lines.

The underlying physical infrastructure of the U.S. electric power industry is divided into 10 NERC (North American Electric Reliability Council) regions. They include the MAIN region, which includes the delivery points for the ComEd Hub contract, and the SERC region, which includes the delivery points for the TVA Hub contract. The map below shows the 10 regions as defined by NERC. See Appendix III for the MAIN and SERC region interconnection maps.



Participants in the U.S. electric industry include investor-owned electric utilities (IOUs), government entities, cooperatives, power marketers, and independent power producers (IPPs). IOUs are the largest sector of the market and account for 80 percent of the U.S. market in terms of production of electricity, revenue, and sales. There are roughly 2,000 governmental entities, including municipal utilities and large federal agencies such as the Tennessee Valley Authority. Cooperatives provide electricity distribution to less-developed parts of the United States. Power marketers are the fastest growing segment in the wholesale power market. They are FERC registered and buy and sell capacity and energy but usually do not own generating, transmission, or distribution assets.

CBOT Electricity Futures Contracts

CBOT Electricity futures and options contracts are designed to reflect current trading practices in the cash market. Since the industry is going through dramatic changes, its evolution and restructuring were key considerations in the development of these contracts.

Trading Unit: The trading unit for both the ComEd Hub and TVA Hub Electricity futures contracts shall be 1,680 Megawatt hours (MWh) of firm electric energy. Bids and offers are accepted in dollars and cents per MWh (\$/MWh) or multiples thereof. The precise 1,680 MWh figure is derived by multiplying 16 hours per day (the on-peak hours) by 21 days per month (mid-point of the standard number of on-peak days per month) times 5 MW (delivery rate)-- $16 \times 21 \times 5 = 1,680$ MWh per contract. On-peak days are defined as any days Monday through Friday that are not off-peak days as designated by the North American Electric Reliability Council (NERC).

Delivery: Although trading in the ComEd Hub and TVA Hub Electricity futures contracts provides a standardized contract size that takes into account a 21 on-peak day delivery month, there will be a variable amount delivered depending on the actual number of on-peak days in the delivery period. Physical delivery standards of the contract are firm electric power at a rate of 5 MW for every on-peak hour for all on-peak days of the delivery month. Contracts will be for delivery in all months of the year. Months listed for trading will be determined by the exchange based on market demand.

Delivery Rate: For those market participants that maintain their position beyond the last day of trading, their delivery commitment will be in accordance with the number of on-peak days in the delivery month. There are five possibilities for the number of on-peak days in a month, ranging from 19 to 23 days. Over the next five years, the percentage of potential delivery months with the various numbers of on-peak days is as follows: 23 days - 10% , 22 days - 33.3%, 21 days - 30%, 20 days - 23.3%, 19 days - 3.3%. Industry participants have access to information to determine future numbers of NERC on-peak days within a given futures delivery period. The quantity delivered will vary by no more than 10 percent over or under the contract size traded.

Delivery Period: The period of time specified for delivery under the contract is every NERC

designated on-peak day of the delivery month from 6:00:01 a.m. to 10:00:00 p.m., Chicago time. This time frame establishes that delivery will take place during peak periods, which corresponds to the industry's need for hedging and price transparency during the peak hours.

Delivery Locations: The electricity market is regionalized due to limited transfer capabilities between the large contiguous regions (Eastern Interconnect, Western Interconnect, and Texas). The ComEd Hub and TVA Hub Electricity futures contracts are intended to be most relevant and useful to market users in the Eastern Interconnect. The contracts will directly reflect electricity prices for the Into ComEd Hub and Into TVA Hub wholesale electricity cash markets. Prices for the Into ComEd Hub and Into TVA Hub cash markets, however, have strong correlations to surrounding hubs.

Hedge Ratios: In many applications, you will need to adjust the number of contracts by a factor which takes into account the actual number of on-peak delivery days in the contract delivery month relative to the standardized 21 days of the futures contracts. Suppose, for example, you want to design a hedge for a month with 22 on-peak delivery days. The adjustment factor will be 1.05 ($22 \div 21 = 1.0476$, rounded to 1.05). The standard adjustment factors are 0.90 for 19 days, 0.95 for 20 days, 1.05 for 22 days, and 1.10 for 23 days.

To hedge in a 21-day month, you find the number of futures contracts needed to hedge by dividing the MWh you are buying or selling by the 1680 MWh of the futures contract. For example, to hedge 33,600 MWh, you will need 20 contracts ($33,600 \div 1,680$). But to hedge the same amount in a 22-day month, you will need 21 contracts (20×1.05).

Part 3

Trading Applications

Taking a Position on Your View of the Market

Suppose you believe electricity prices will rise significantly during a hot summer and think the CBOT Electricity futures have not fully priced in the effect of an unusually hot August. You can buy CBOT ComEd Hub Electricity futures to profit from your market view.

Strategy

On June 15, with August ComEd Hub Electricity futures trading at \$28/MWh, you buy one August ComEd Hub futures contract at the market.

During the following weeks, if wholesale electricity prices increase, confirming your expectations, you can earn a profit. Assume that on July 20, with the August ComEd Hub Electricity futures trading at \$33/MWh, \$5/MWh higher than it was in June, you unwind (or exit) the trade by selling one August contract.

Table 1: Long Futures Trade

	Futures	in Dollars
June 15	buy 1 August ComEd Hub @ \$28/MWh ($\times 1,680$ MWh)	\$47,040
July 20	sell 1 August Com Ed @ \$33/MWh ($\times 1,680$ MWh)	<u>\$55,440</u>
<u>Net profit</u>		<u>\$8,400</u>

Results

As Table 1 shows, because you accurately predicted that electricity prices would rise in the weeks before August, you profited. The August ComEd Hub futures rose from \$28/MWh to \$33/MWh to give you a profit of \$8,400 ($\$5/\text{MWh} \times 1,680 \text{ MWh/contract} \times 1 \text{ contract}$).

(Note: All trading examples ignore such costs as commissions, margins, and capital requirements.)

Spreading ComEd and TVA Futures

Suppose your research shows an historical average spread of \$3/MWh between TVA Hub and ComEd Hub Electricity futures. Noticing that the spread is currently trading at \$4/MWh between the two futures contracts and expecting it to narrow to historical levels prior to delivery, you decide to sell a ComEd Hub contract and buy a TVA Hub contract to try to profit from the realignment.

Strategy

On December 15, with February ComEd Hub futures trading at \$40/MWh and TVA Hub futures trading at \$36/MWh, you sell one February ComEd Hub futures contract at \$40/MWh and buy one February TVA Hub futures at \$36/MWh. You will benefit from this trade if the futures spread narrows to historical levels--that is, the TVA Hub price rises relative to the ComEd Hub price.

During the following weeks, suppose the spread does narrow. On January 15, deciding to unwind the trade with ComEd Hub futures trading at \$41/MWh and TVA Hub futures trading at \$37.50/MWh, you buy back the ComEd Hub and sell the TVA Hub contracts.

Table 2: Intercommodity Spread

	Futures	in Dollars	
December 15	sell 1 February ComEd Hub @ \$40/MWh	\$67,200	
	buy 1 February TVA Hub @ \$36/MWh	<u>-\$60,480</u>	\$6,720
	January 15	buy 1 February ComEd Hub @ \$41/MWh	-\$68,880
	sell 1 February TVA Hub @ \$37.50/MWh	<u>\$63,000</u>	<u>-\$5,880</u>
	Net profit		<u>\$840</u>

Results

As Table 2 shows, the ComEd Hub/TVA Hub spread narrowed with the price of ComEd Hub futures increasing from \$40/MWh to \$41/MWh and TVA Hub futures increasing from \$36/MWh to \$37.50/MWh. As a result, the spread generated a net profit of \$840 ($\$0.50/\text{MWh} \times 1,680 \text{ MWh/contract} \times 1 \text{ contract}$).

Wheeling Example

As a power marketer, assume you must deliver 73,600 MWh of electricity into the ComEd Hub in March 1999 ($200 \text{ MW} \times 16 \text{ hours/day} \times 23 \text{ days/month}$). You can buy March ComEd Hub futures at \$40/MWh and take these contracts to delivery. You notice, however, that March TVA Hub futures are trading at \$32/MWh. Since you can get the electricity to the ComEd Hub for delivery in one wheel (a movement of power across intervening hubs with each hub counting as one wheel), you have an alternative approach that can often increase your margin.

Strategy

In January, with ComEd Hub trading at \$40/MWh and TVA Hub at \$32/MWh, you buy TVA Hub futures with the intent to take delivery and wheel into the ComEd Hub through only one interconnecting hub. Assume you can lock in a wheeling cost (subject to policies of the Control Areas) of \$3/MWh with a dissipation rate of 2.25% (subject to transmission conditions at the Control Areas), but you must adjust the number of contracts to account for the dissipation by entering into 41 contracts ($200 \text{ MW} \div 5 \text{ MW/contract} \times 1.0225$) rather than 40. You buy 41 March TVA Hub futures, take delivery in March, and wheel the electricity into the ComEd Hub.

Table 3: Wheeling Example

	Cash	Futures in Dollars
January 15	sell forward 73,600 MWh into ComEd Hub @ \$40/MWh	buy 41 March'99 TVA Hub @ \$32/MWh
February 25		take delivery for 23 days or 75,440 MWh-\$2,414,080
	dissipation of 1,694 MWh lost during wheeling	
	sell forward 146 MWh of excess delivered power into TVA Hub @ \$30/MWh, the current cash price	\$4,380
	wheeling charge on 73,600 Mwh	-\$220,800
March 1	deliver 73,600 into ComEd Hub	<u>\$2,944,000</u>
Net profit		<u>\$313,500</u>

Results

As Table 3 shows, the price differential between the TVA and ComEd Hubs worked in your favor. It cost you \$2,414,080 to buy and take delivery of 75,440 MWh (16 hours/day \times 23 days \times 5 MW \times 41 contracts) of TVA Hub power. The wheeling charge was \$220,800 on 73,600 MWh (73,600 MWh \times \$3/MWh). After 1,694 MWh were lost due to dissipation, you were able to sell the remaining 146 MWh (75,440 MWh - 75,294 MWh) back into TVA Hub at the 1-month forward price of \$30/MWh on February 25. The \$313,500 profit from the wheeling transaction--including the futures trade, the physical power delivery, and the resale of the excess--gave you a gross margin of \$4.26/MWh on the power wheeled from the TVA Hub into the ComEd Hub.

Part 4

Hedging

Hedging Peak Demand Periods

The two most volatile times for electricity prices occur in January-February and July-August, the peak demand months. Since electricity is a flow commodity and cannot be stored, its prices depend on market demand. Suppose you are a power buyer for an industrial company, and one of your goals is to control peak month power costs.

Strategy

Your company has a base load of 100 MW of power during the on-peak hours of on-peak days. For the 21- and 22-day months of July and August, 1999, you will need 33,600 and 35,200 MWh, respectively. You have a source for the power and do not intend to take delivery of electricity through the futures market delivery process. However, the price of that power will not be determined until the electricity is delivered. To lock in the price, you can place a long hedge using CBOT electricity futures.

The mechanics of a long hedge are straightforward. Since you must buy electricity in the future, you are vulnerable to rising prices. To avoid that, you can buy the electricity temporarily in the futures market. When the time comes to buy the actual power, you do so at the 1-month forward price and simultaneously sell the futures to offset or liquidate your futures obligations (that is, lift the hedge). Because the futures market will reflect the rising prices, your futures gain will offset the rise in the price of physical electricity, wholly or in large part, to make your net price essentially the same as the futures price on the day you initiated the hedge.

You determine the appropriate number of contracts for the hedge by dividing the number of MWh hedged by 1,680 MWh, the contract size. To initiate this hedge, you need to buy 20 July '99 and 21 August '99 TVA Hub futures on June 1 at prices of \$36/MWh and \$38/MWh, respectively. Table 5 shows how such a hedge might perform.

Table 5: Hedging a Peak Period

	Cash	in Dollars	Futures	in Dollars
June 1, 1999			buy 20 July TVA Hub @ \$36/MWh	-\$1,209,600
			buy 21 August TVA Hub @ \$38/MWh	-\$1,340,640
June 25, 1999	buy 33,600 MWh @ \$38/MWh	\$1,276,800	sell 20 July TVA Hub @ \$38/MWh	\$1,276,800
July 27, 1999	buy 35,200 MWh @ \$41/MWh	\$1,443,200	sell 21 August TVA Hub @ \$41/MWh	\$1,446,480
Cash cost	\$2,720,000			
<u>Futures gain</u>	<u>\$173,040</u>			
Net cost	\$2,546,960			
<u>Net price</u>	<u>\$37.02/MWh</u>			

Results

You are able to liquidate your futures position at a profit. When you sell July futures on June 25, you make a \$67,200 (20 contracts \times \$2/MWh \times 1,680 MWh/contract). And when you sell August futures on July 27, you make a profit of \$105,840 (21 contracts \times \$3/MWh \times 1,680 MWh/contract)--for a total futures profit of \$173,040. This futures profit partially offsets the purchase cost of the physical electricity you buy in July and August to give you a net price of \$37.02/MWh for electricity in July and August ($\$2,546,960 \div (33,600 \text{ MWh} + 35,200 \text{ MWh})$). Unhedged, you would have paid an average of \$39.53/MWh ($\$2,720,000 \div 68,800 \text{ MWh}$).

Hedging with CBOT Electricity Futures: A Power Marketer's Perspective

While the primary uses of futures contracts are to provide price discovery (and transparency) and tools for managing price risk, power marketers can also use electricity futures contracts to obtain physical electricity. By going long futures, you are entitled to take possession of electricity at the hub the seller chooses during the specified delivery month. Although futures positions rarely result in delivery, the delivery potential validates the futures prices.

Scenario

As a power marketer, suppose you have a customer who wants to take delivery of 50 MW of electricity into the ComEd Hub during each on-peak hour of each on-peak day of the year. Your customer wants a fixed price of \$22/MWh for the one-year period. Because of the volatility of electricity prices--resulting from competitive pricing, regional weather, and consumption patterns--you stand to lose millions on a deal such as this if prices rise. But you can use electricity futures to protect your acquisition costs of future power purchases for your customer without a price commitment from a seller.

Strategy

You decide to buy a strip of ComEd Hub Electricity futures at the CBOT, which involves a long position in each month for a one-year period. Once the futures positions are in place, you can take delivery of the required power each month, sell the power into the wholesale electricity market, and effectively lock in your margin. Theoretical futures prices for the ComEd Hub for a 12-month period are as follows:

Theoretical ComEd Hub	
<u>Futures</u>	<u>Prices/MWh</u>
January	\$22/MWh
February	\$23/MWh
March	\$22/MWh
April	\$19/MWh
May	\$19/MWh
June	\$22/MWh
July	\$24/MWh
August	\$26/MWh
September	\$24/MWh
October	\$20/MWh
November	\$21/MWh
<u>December</u>	<u>\$22/MWh</u>
ComEd Hub Strip	\$22/MWh

In this example, you can offer your customer a price of \$22/MWh plus the profit margin. You buy 10 contracts of each of the 12 monthly futures to hedge a commitment of 50 MW and create the ComEd Hub strip. This allows you to lock in a margin.

Hedging with Options: An Electricity Buyer's Perspective

As an electricity buyer, you might have concerns about possible price increases during the coming summer. In April 1999, you notice that CBOT TVA Hub Electricity futures are trading at \$36/MWh. While that seems a good price to lock in with a futures long hedge, you don't want to pay a rate significantly above the market should the summer turn out to be cooler than forecasters expect and prices drop instead of rise. This is a situation tailor-made for call options, for calls will allow you to lock in a purchase price and still participate in downside moves.

Strategy

Suppose you need 16,800 MWh in July 1999 or 50 MW every on-peak hour of each on-peak day in July ($50 \text{ MW} \times 16 \text{ hours/day} \times 21 \text{ days}$) and can tolerate some upward movement in prices. With each option covering 1,680 MWh, you buy 10 July call options to cover your needs. The July call with a strike price of \$38/MWh is trading at a premium of \$3/MWh, which gives you protection if prices go above \$41/MWh (the strike price plus the premium). Buying this call effectively caps your July power price while allowing you to benefit from lower prices.

Suppose further that by June 24, 1999 (the last trading day for options), the spot price for July '99 TVA Hub electricity rises to \$43/MWh. In that case, as Table 6 shows, the option will appreciate enough in value to hold your effective price to \$41/MWh ($\$688,800 \div 16,800 \text{ Mwh}$).

Table 6: Protecting Against Rising Prices

	Cash	in Dollars	Options	in Dollars
April 15			buy 10 \$38/MWh July TVA Hub calls @ \$3/MWh	-\$50,400
June 24	buy 16,800 MWh @ \$43/MWh	\$722,400	sell 10 \$38/MW July TVA Hub calls @ \$5/MWh	\$84,000
			Option gain	\$33,600
	Cash cost	\$722,400		
	Option gain	\$33,600		
	Net cost	\$688,800		
	Net price	\$41/MWh		

Results

When you offset the 10 TVA Hub options at \$5/MWh, your option position earns you a \$33,600 profit to cap your effective price at \$41/MWh.

Hedging with Options: A Utility's Perspective

As treasurer of an electric utility, you might be concerned that warm winter weather will drive electricity prices down and prevent your firm from achieving revenue expectations. With January futures trading at \$40/MWh, you could sell futures to lock in that sale price on 500 MW of generating capacity. But, if the weather turns very cold instead, prices could rise well above \$40/MWh, in which case you would like to profit from the increase in prices.

In a situation like this, put options are ideal risk management tools, for a put establishes a floor price while still allowing you to participate in upside moves. You choose a strike price based on how much revenue loss your firm can afford.

Strategy

Suppose you anticipate generating 160,000 MWh of on-peak electricity during January 1999 (500 MW × 16 hours/day × 20 days), and consider \$35/MWh an acceptable floor price. Accordingly, you can buy \$38/MWh January ComEd Hub puts at a premium of \$3/MWh. To find the number of options you need, you divide your total anticipated on-peak generation by 1,680 MWh, the size of the option contract, to determine that you will need 95 put options (160,000 MWh ÷ 1,680 MWh/contract). At the end of December, you can liquidate the puts and use the profit to partially offset the decline in the cash electricity price.

Table 7: Protecting Against Declining Prices

Cash	in Dollars	Options	in Dollars
November 15		buy 95 \$38/MWh January ComEd Hub puts @ 3/MWh	-\$478,800
December 24		sell 95 \$38/MWh January ComEd Hub puts @ \$5/MWh	<u>\$798,000</u>
sell 160,000 MWh @ \$33/MWh	\$5,280,000	Option gain	<u>\$319,200</u>
Cash revenue	\$5,280,000		
Option gain	<u>\$319,200</u>		
Net revenue	\$5,599,200		
Net price	<u>\$35/MWh</u>		

Results

Table 7 shows that the puts earned \$319,200 to give you, with the late December sale, a net revenue of \$5,599,200, or \$35/MWh.

Hedging with Options: Using a Collar to Hedge

As a power buyer, you might want to cap rising electricity prices but find the cost of a call more than you care to pay. In a situation like this, an option collar is often a useful strategy. To

establish a collar, you buy a call and simultaneously sell a put with the same expiration. The long call caps the price of the electricity you must buy, while the proceeds from the sale of the put will reduce the cost of the protection and provide limited downside participation.

Strategy

Suppose that at 100 MW per on-peak day you will need 32,000 MWh in February 1999, a month with 20 on-peak days (100 MW × 16 hours/day × 20 days). With your usage equivalent to 19 futures contracts (32,000 MWh / 1,680 MWh), you can build a collar by buying 19 February ComEd Hub calls and selling 19 February ComEd Hub puts. On November 15, with February ComEd Hub futures trading at \$35/MWh, the \$38/MWh February ComEd Hub call trading at \$3.25/MWh and the \$32/MWh February ComEd Hub put trading at \$2.50/MWh will provide the coverage you need.

Table 8: Collaring Power Costs

	Cash	in Dollars	Options	in Dollars
Nov 15			buy 19 \$38/MWh Feb ComEd Hub calls @ \$3.25/MWh	-\$103,740
			sell 19 \$32/MWh Feb ComEd Hub puts @ \$2.50/MWh	<u>\$79,800</u>
			Net premium paid	-\$23,940
Jan 22	buy 32,000 MWh @ \$43/MWh	\$1,376,000	sell 19 \$38/MWh Feb ComEd Hub calls @ \$5/MWh (puts expire valueless)	\$159,600 <u>\$0</u>
			Option gain	\$135,660
	Cash cost	\$1,376,000		
	<u>Option gain</u>	<u>\$135,660</u>		
	Net cost	\$1,240,340		
	<u>Net price</u>	<u>\$38.76/MWh</u>		

Results

Table 8 shows that the combined option position reduces the cost of your protection from \$103,740 to \$23,940 (\$3.25/MWh to \$0.75/MWh). The collar also alters the level of protection in your favor. The call alone would cap your upward price exposure at \$41.25 (\$38/MWh +

\$3.25/MWh), but the collar lowers that to \$38.75/MWh ($\$41.25/\text{MWh} - \$2.50/\text{MWh}$). Thus, you get more protection for less dollar outlay, the cost coming in the form of the downside participation you give up. If the predictable downside opportunity falls close to the floor the collar gives you, that may seem a good tradeoff.

Part 5

Appendixes

Appendix I

Characteristics of ComEd Hub and TVA Hub Electricity Futures and Options

Chapter 53 ComEd Hub Electricity Futures Trading Conditions

5302.01 Application of Regulation - Transactions in ComEd Hub electricity futures shall be subject to the general Rules of the Association as far as applicable and shall also be subject to the Regulations contained in this chapter, which are exclusively applicable to trading firm electric energy into and out of the Commonwealth Edison Control Area.

5303.01 Definitions

(A) "Commonwealth Edison Control Area" or "ComEd Control Area" means the electric power system(s) consisting of all of Commonwealth Edison's transmission and generating facilities in which a common automatic generation scheme is applied in: 1) matching the power output of the generators within the system(s) and capacity and energy purchased from outside entities; and 2) maintaining scheduled interchange and frequency with other Control Areas while providing sufficient generating capacity to maintain operating reserves. The ComEd Control Area is recognized by the North American Electric Reliability Council (NERC).

(B) "Firm electric energy" means the highest quality electric energy offered to customers under a filed rate schedule that anticipates no planned interruption. Only emergencies or force majeure by utilities can interrupt the flow of firm power.

(C) "On-peak" or "On-peak day" means 6:00:01 a.m to 10:00:00 p.m. on any day between and including Monday through Friday , excluding any day which has been designated as an "off-peak" day or a holiday by the North American Electric Reliability Council (NERC).

(D) "Force Majeure" means any circumstance (including but not limited to a strike, lockout, national emergency, government action, or act of God) which is beyond the control of the buyer or seller, and which prevents the buyer or seller from making or taking delivery of electric energy or effecting payment and which, by exercise of due diligence, the affected party could not have been reasonably expected to avoid and which, by exercise of due diligence, said party is unable to overcome.

(E) "Delivering party" means the seller providing capacity and energy to be transmitted at point(s) of receipt.

(F) "Megawatt" means one million watts.

(G) "Transmission Service Agreement" means the initial agreement and any amendments or supplements thereto entered into by the transmission customer and transmission provider for service under Commonwealth Edison's

Federal Energy Regulatory Commission (FERC) tariff.

(H) "MAIN" means the Mid-America Interconnected Network.

(I) "Tennessee Valley Authority Control Area" or "TVA Control Area" means the electric power system(s) consisting of all of Tennessee Valley Authority's transmission and generating facilities in which a common automatic generation scheme is applied in: 1) matching the power output of the generators within the system(s) and capacity and energy purchased from outside entities; and 2) maintaining scheduled interchange and frequency with other Control Areas while providing sufficient generating capacity to maintain operating reserves. The TVA Control Area is recognized by the North American Electric Reliability Council (NERC).

(J) All times referred to in these rules shall be Central Time unless otherwise specified.

5304.01 Unit of Trading - The unit of trading for ComEd Hub electricity futures shall be 1,680 Megawatt hours (MWh) of firm electric energy. Bids and offers may be accepted in dollars and cents per MWh (\$/MWh) or multiples thereof.

5305.01 Months Traded - Trading in ComEd Hub electricity futures may be conducted in the current month and any subsequent months as determined by the Exchange.

5306.01 Price Basis - Minimum price fluctuations shall be \$.01 per MWh. Contracts shall not be made on any other price basis.

5307.01 Hours of Trading - The hours of trading for future delivery in ComEd electricity shall be determined by the Board. The market shall be opened and closed for all months simultaneously, or in such other manner as the Regulatory Compliance Committee shall direct.

5308.01 Trading Limits

(A) The maximum permissible price fluctuation in any one day shall be \$7 per MWh above or below the preceding day's settlement price for any month succeeding the nearby trading month.

(B) If one or more contract months close on limit bid for one business day or on the limit sellers for one business day, then the limit would be raised to 150 percent of the current level for all contract months and remain there for two successive business days.

If one or more contracts months close on the limit bid on the last business day of the expanded limit period or on the limit sellers on the last business day of the expanded limit period then the limits will remain at 150 percent of the original level for another two day period.

The limits would remain at 150 percent for successive periods of two business days until none of the contracts close at the limit bid or limit sellers on the last day of the period. If on the last day of a two day business period none of the contracts close on the limit bid or limit sellers then the limits would revert to their original level at the end of the two day period.

(C) There shall be no maximum limit on price fluctuation for the nearby trading contract.

5309.01 Last Day of Trading

(A) No trades in ComEd electricity futures deliverable in the current month shall be made during the last three

business days prior to the first calendar day of the delivery month.

(B) No participant may make or take delivery or enter into an exchange for physical transaction on the last trading day unless, prior to the opening of trading on the last trading day, its clearing member has obtained from it:

- (1) A copy of a signed written transmission service agreement or enabling agreement into (from) the ComEd Control Area, and where such agreement is not for firm transmission for such participant, verification of alternative arrangements for transmission into (from) the ComEd Control Area approved by the Control Area operator, such that a delivery under the terms of this Chapter may be made. The quantity of electric energy identified in such agreement(s) or arrangement(s) must be equal to or greater than the quantity required by the number of contracts that the seller will deliver; and
- (2) Written confirmation from each participant holding a long(short) position in that contract that:
 - (a) if short, the participant has generation capacity or a purchase agreement for a quantity and quality of firm electric energy sufficient to meet such participant(s) obligations to make delivery as prescribed by these Rules, and is not restricted by federal law to which parties it may sell electric energy;
 - (b) if long, the participant has load or resale commitments equal to the quantity and quality it intends to receive in delivery; and
 - (c) whether short or long, such participant has a reasonable basis to believe that transmission service will be available to satisfy the needs of the participant.

(C) If a clearing member fails to obtain the documents required to be furnished by a participant by paragraph (B) hereof, the clearing member shall liquidate all open long or short positions for which such documents have not been obtained by entering a market order at least one hour prior to the beginning of the close of trading on the last day of trading without liability to the owner or controller of such position.

(D) An open position may be liquidated by a bona fide exchange for physical for the actual commodity, no later than 11 a.m. on the first business day following the last day of trading. Participants holding a short (long) position in the expiring month after the close of trading on the day before last trading day and planning to execute an EFP are subject to the requirements of paragraph (B).

(E) Any party that is restricted by federal law to which parties it may sell electric energy from the Tennessee Valley Authority Control Area, may not give notice for delivery, or participate in an exchange for physical transaction involving the sale of electric energy to parties to whom it is restricted to sell to, and must liquidate all short positions prior to the expiration of trading. Notwithstanding any provision of these Rules, the clearing member of a party subject to such a restriction shall liquidate all open short positions of that party by entering a market order at least one hour prior to the beginning of the close of trading on the last day of trading without liability to the owner or controller of such position.

5310.01 **Margin Requirements** - (See CBOT Regulation 431.03)

5311.01 **Position Limits and Reportable Positions** - (See CBOT Regulation 425.01)

5336.01 **Standards** - The contract grade for delivery on futures contracts made under these Regulations shall be firm electric energy in the form of three phase current alternating at a nominal frequency of 60 hertz, and

be in conformance within the specifications of Mid-America Interconnect Network (MAIN) as well as all applicable Federal, State, and Local laws and regulations. The seller shall provide firm electric energy which is free from all liens, encumbrances, unpaid taxes, fees and other charges.

5337.01 Date of Delivery -Participants holding a short position in the expiring month after the close of trading on the last trading day and who do not execute an EFP pursuant to Regulation 5309.01, are obligated to perform delivery pursuant to either Regulation 5343.06, 5343.07 or 5343.08.

5343.01 Delivery Notices - (See CBOT Regulation 1047.01)

5343.02 Time and Issuance of Delivery Notices - (See CBOT Regulation 1049.01)

5343.03 Buyer's Report of Eligibility to Receive Delivery - (See CBOT Regulation 1049.02)

5343.04 Clearing Member Firms' Obligations - Upon receipt of the name of the respective long clearing member (buyer) obligated to accept delivery from him, the short clearing member shall contact the long clearing member to which it has been assigned to decide upon the equitable allocation of the positions. Following the equitable allocation of the assigned positions, the short clearing member firm shall prepare invoices addressed to its assigned long clearing member firms. Both the long and short clearing member firm must immediately communicate to their customers the name of the party to whom it has been matched. The respective clearing member firm shall provide authorized official contact names and telephone numbers for the Long and the Short to communicate so that the Short can make the required transmission arrangements to deliver electric energy, and the Long can make the required arrangements to receive electric energy.

5343.05 Method of Delivery - (See CBOT Regulation 1048.01)

5343.06 Time of Delivery, Payment, Delivery Procedures

(A) For the purpose of this Chapter,

(1) "Payment Date" shall mean the twenty-fifth (25) calendar day of the month following the delivery month. If such date is a Saturday or an Exchange or federal banking holiday other than Monday, payment shall be made on the preceding business day which is not an Exchange or federal banking holiday. If such a day is a Sunday or an Exchange or federal banking holiday which occurs on a Monday, payment shall be made on the next business day which is not an Exchange or federal banking holiday.

(2) "Long" shall mean the owner of a long position.

(3) "Short" shall mean the owner of a short position.

(4) "Failure to Perform" shall mean the failure of the Short to make or the Long to receive delivery of firm electric energy in accordance with the requirements set forth in these Rules.

(B) On every on-peak day of the delivery month, delivery terms shall be 5 megawatts starting with the hour beginning at 6:00:01 a.m. and ending at 10:00:00 p.m. Central time. The following schedule shall be used to determine the delivery unit in months having on-peak days as set forth below:

1,520 MWh for delivery months with 19 on-peak days
1,600 MWh for delivery months with 20 on-peak days
1,680 MWh for delivery months with 21 on-peak days
1,760 MWh for delivery months with 22 on-peak days
1,840 MWh for delivery months with 23 on-peak days.

Delivery shall be made by any one or combination of the following methods:

- (1) By delivery into the Commonwealth Edison transmission system. The Short's and Long's obligations shall be defined as follows:
 - (a) The Short is required to deliver firm electric energy into the Commonwealth Edison transmission system at any interface designated by the Short that is available to the Long. The Short's designated interface may change for each respective delivery day in the delivery month.
 - (b) The Long's confirmed transmission request recorded on the Commonwealth Edison Open Access Same Time Information System (OASIS) shall be the determination of transmission service availability. The Long shall notify the Short of a confirmed transmission request subject to the request deadline for transmission service.
 - (c) If the interface point designated by the Short is not available for the Long, then the Short shall be required to make one of the following designations to the Long: (1) an alternate interface point for which transmission service is available to the Long, or (2) generation inside of the ComEd Control Area.
 - (d) The Short is responsible for transmission service required to deliver energy from the generating source to any Commonwealth Edison interface. The Short is not responsible for transmission service within the Commonwealth Edison transmission system. The Long has the obligation to receive firm electric energy at the Commonwealth Edison interface designated by the Short and is responsible for transmission service within the Commonwealth Edison transmission system.
- (2) All or part of a standard delivery obligation can also be made by book transfer, provided that the Long and Short mutually agree to such transfer. For purposes of this regulation, a book transfer is defined as a book adjustment effecting a title transfer between the Long and Short which involves the offset of a delivery obligation by a cash market obligation.

(C) Delivery shall commence no earlier than the first on-peak day of the delivery month. Delivery shall be completed no later than the last on-peak day of the delivery month.

(D) On the second business day following the last day of trading, the long clearing member shall obtain from the Long, margin equal to the full value of the electric energy to be delivered. The full value of the electric energy shall be the final contract settlement price multiplied by 5 megawatts rate multiplied by 16 hours per delivery day multiplied by the number of delivery days in the delivery month multiplied by the number of contracts delivered. The short clearing member shall obtain from the Short margin in the amount fixed, from time to time, by the Exchange. The long clearing member and the short clearing member shall deposit with the Clearing House margins in the amount and in such form as required by the Clearing House. Such margins, shall be returned on the first business day following notification to the Exchange and the Clearing House that delivery and payment have been completed.

(E) No later than 12:00 o'clock noon Central time on the third business day prior to the Payment Date, the Short

shall advise the short clearing member of the name and address of the bank, and the name of the bank account to which payment shall be made. The short clearing member shall advise the long clearing member who shall advise the Long. On the Payment Date, the Long shall pay the Short by federal funds wire transfer to the account of the short at the bank nominated by the Short by 3 p.m. Central Time. No later than 12:00 noon Central time the Long shall advise the long clearing member and the short clearing member who shall similarly advise the Short of the federal funds wire transfer number and the name of the sending bank.

(F) No later than the first business day following the Payment Date, the Short, shall advise the short clearing member of receipt of payment and provide proof of execution of the schedule by the relevant control area operators. The short clearing member shall deliver a notice of payment to the long clearing member with a copy to the Clearing House no later than the first business day following the Payment Date. Receipt of such notice by the long clearing member, along with proof of execution of the schedule by the relevant control area operators, shall constitute proof of delivery and title transfer.

- (1) Any payment made on the Payment Date shall be based on electric energy actually delivered.
- (2) Force Majeure is the only exception for late performance of above described delivery terms. An Exchange committee shall be authorized to resolve disputes relating to a failure to perform or Force Majeure.

(G) If a dispute relating to the performance of delivery obligations arises, the dispute shall be referred to the appropriate Exchange committee for resolution.

(H) The Long's clearing member firm shall be responsible for any failure to perform by the Long. The Short's clearing member firm shall be responsible for any failure to perform by the Short. Neither the Exchange nor the Clearing House shall be liable for any loss, cost or expense arising from the failure of a Long or its clearing member or a Short or its clearing member to perform any of their respective delivery obligations under the provisions of this chapter.

(I) Participants making or taking delivery of electric energy pursuant to these Rules shall adhere to the applicable scheduling and transmission procedures and practices of MAIN, ComEd Control Area, and FERC.

5343.07 Delivery by Mutual Agreement

Upon mutual agreement, in writing, the Long and the Short may amend provisions of Regulation 5343.06(B) related to Delivery Rate and Regulation 5343.06(C) related to Timing of Delivery, except that no amendment shall be permitted that would allow the delivery to take place outside the delivery month.

These amendments must be filed with the Long and Short's respective clearing members.

5343.08 Alternative Delivery Procedure

The Short (Long) may agree with the Long (Short) with which it has been matched to make and take delivery under terms or conditions which differ from the terms and conditions prescribed in this Chapter. If agreed upon, the respective Clearing Members must execute an Alternative Delivery Notice on the official form prescribed by the Exchange and shall deliver a completed executed copy of such Notice to the Clearing House. The delivery of an

executed Alternative Delivery Notice to the Clearing House shall release the clearing members and the Clearing House from their respective obligations under this Chapter. The filing of such a notice allows the Long and the Short to negotiate mutually acceptable terms for the settlement of the obligation.

By executing such Notice, the Long and the Short shall indemnify their respective clearing members, the Exchange and the Clearing House from any claim, loss, liability, cost or expense arising from the execution, delivery or performance of such contracts or such agreement, or any breach thereof or default thereunder. Upon receipt of an executed Alternative Delivery Notice, the Clearing House will return to the clearing members all margin monies held for the account of each with respect to the contracts involved.

Chapter 54 ComEd Hub Electricity Options on Futures Trading Conditions

5401.00 Authority - (See Rule 2801.00).

5401.01 Application of Regulations - Transactions in put and call options on ComEd Hub Electricity futures contracts shall be subject to the general rules of the Association as far as applicable and shall also be subject to regulations contained in this chapter which are exclusively applicable to trading in put and call options on ComEd Hub Electricity futures contracts (see Rule 490.00).

5402.01 Nature of ComEd Hub Electricity Futures Put Options - The buyer of one (1) ComEd Hub Electricity futures put option may exercise his option at any time prior to expiration (subject to Regulation 5407.01), to assume a short position in one (1) ComEd Hub Electricity futures contract of a specified contract month at a striking price set at the time the option was purchased. The seller of one (1) ComEd Hub Electricity futures put option incurs the obligation of assuming a long position in one (1) ComEd Hub Electricity futures contract of a specified contract month at a striking price set at the time the option was sold, upon exercise by a put option buyer.

5402.02 Nature of ComEd Hub Electricity Futures Call Options - The buyer of one (1) ComEd Hub Electricity futures call option may exercise his option at any time prior to expiration (subject to Regulation 5407.01), to assume a long position in one (1) ComEd Hub Electricity futures contract of a specified contract month at a striking price set at the time the option was purchased. The seller of one (1) ComEd Hub Electricity futures call option incurs the obligation of assuming a short position in one (1) ComEd Hub Electricity futures contract of a specified contract month at a striking price set at the time the option was sold, upon exercise by a call option buyer.

5403.01 Trading Unit - One (1) ComEd Hub Electricity futures contract of a specified contract month on the Chicago Board of Trade.

5404.01 Striking Prices - Trading shall be conducted for put and call options with striking prices (the "strikes") in integral multiples of one dollar (\$1) per megawatt hour per ComEd Hub Electricity futures contract (i.e., 18.00, 19.00, 20.00, etc.), the "first tier"; and in integral multiples of two dollars \$2.00 megawatt hour per ComEd Hub Electricity futures contract (i.e., 22.00, 24.00, 26.00, etc.), the "second tier" as follows:

- (1) (a) Per the first tier, at the commencement of trading for an option contract, the following strikes shall be listed: one with a strike closest to the previous day's settlement price of the underlying ComEd Hub Electricity futures contract, the next twenty consecutive higher strikes and the next twenty consecutive lower strikes (the "initial band"). If the previous day's settlement price is midway between two strikes, the closest price shall be the larger of the two.
- (b) Per the second tier, at the commencement of trading for an option contract, the following strikes shall be listed: the next ten consecutive strikes above and the next ten consecutive strikes below the initial band.
- (c) Per the first tier, over time, strikes shall be added as necessary to insure that at least twenty strikes above and below the previous day's trading range of the underlying futures are listed (the "minimum band").
- (d) Per the second tier, over time, strikes shall be added as necessary to insure that the next ten consecutive strikes above the minimum band the next ten consecutive strikes below the minimum band are listed.

- (e) No new strikes may be added by these procedures in the month in which an option expires.
- (2) (a) Per the second tier, all strikes in which the previous day's delta factors (as determined by the Board of Trade) for both the put and call options are 0.10 or greater for two consecutive business days will be listed for trading. However, no new strikes may be added by this procedure to an option month unless open positions exist in that contract month.
- (b) Per the first tier, during the month in which an option expires, all strikes in which the previous day's delta factors (as determined by the Board of Trade) for both the put and call options are 0.10 or greater for two consecutive business days will be listed for trading.
- (3) All strikes will be listed prior to the opening of trading on the following business day. The Exchange may modify the procedures for the introduction of strikes as it deems appropriate in order to respond to market conditions.

5405.01 Payment of Option Premium - The option premium must be paid in full by each clearing member to the Clearing House and by each option customer to his commission merchant at the time the option is purchased, or within a reasonable time after the option is purchased.

5406.01 Option Premium Basis - The premium for ComEd Hub Electricity futures options shall be in multiples of one-half of one cent per megawatt hour (\$8.40 per contract). Contracts shall not be made on any other basis.

However, when both sides of the trade are closing transactions, the option premium may range from \$1.00 to \$8.00 in \$1.00 increments per option contract.

5407.01 Exercise of Option - The buyer of a ComEd Hub Electricity futures option may exercise the option on any business day prior to expiration by giving notice of exercise to the Clearing Corporation by 6:00 p.m. (Central time) on such day.

5407.02 Automatic Exercise - Notwithstanding the provisions of Regulation 5407.01, after the close on the last day of trading, all in-the-money options shall be automatically exercised, unless notice to cancel automatic exercise is given to the Clearing Corporation.

Notice to cancel automatic exercise shall be given to the Clearing Corporation by 6:00 p.m. (Central time) on the last day of trading.

5408.01 Expiration of Option - Unexercised ComEd Hub Electricity futures options shall expire at 6:00 p.m. (Central time) on the last day of trading.

5409.01 Months Traded - Trading may be conducted in ComEd Hub Electricity futures options in the same months that are listed for trading in the ComEd Hub Electricity futures contracts, provided however that the Exchange may determine not to list a contract month. There shall be no trading in ComEd Hub Electricity futures options for months in which the ComEd Hub Electricity futures are not traded on the Chicago Board of Trade.

5410.01 Trading Hours - The hours of trading options on ComEd Hub Electricity futures shall be determined by the Board. On the last day of trading in an expiring option, the closing time for such options shall

be 12:00 noon, subject to the provisions of the second paragraph of Rule 1007.00. On the last day of trading in an expiring option, the expiring ComEd Hub Electricity futures options shall be closed with a public call made striking price by striking price, conducted by such persons as the Regulatory Compliance Committee shall direct. On all other days, ComEd Hub Electricity futures options shall be opened and closed for all months and striking prices simultaneously or in such a manner as the Regulatory Compliance Committee shall direct.

5411.01 **Position Limits** - (See Regulation 495.01).

5412.01 **Margin Requirements** - (See Regulation 431.05).

5413.01 **Last Day of Trading** - No trades in ComEd Hub Electricity futures options expiring in the current month shall be made after 12:00 noon on the business day immediately preceding the expiration of the underlying futures contract.

5414.01 **Option Premium Fluctuation Limits** - Trading is prohibited during any day except for the last day of trading in ComEd Hub Electricity futures options at a premium of more than the trading limit for the ComEd Hub Electricity futures contract above and below the previous day's settlement premium for that option as determined by the Clearing Corporation. On the first day of trading, limits shall be set from the lowest premium of the opening range.

Chapter 55 TVA Hub Electricity Futures Trading Conditions

5502.01 Application of Regulation - Transactions in TVA Hub electricity futures shall be subject to the general Rules of the Association as far as applicable and shall also be subject to the Regulations contained in this chapter, which are exclusively applicable to trading firm electric energy into and out of the Tennessee Valley Authority Control Area.

5503.01 Definitions

(A) "Tennessee Valley Authority Control Area" or "TVA Control Area" means the electric power system(s) consisting of all of Tennessee Valley Authority's transmission and generating facilities in which a common automatic generation scheme is applied in: 1) matching the power output of the generators within the system(s) and capacity and energy purchased from outside entities; and 2) maintaining scheduled interchange and frequency with other Control Areas while providing sufficient generating capacity to maintain operating reserves. The TVA Control Area is recognized by the North American Electric Reliability Council (NERC).

(B) "Firm electric energy" means the highest quality electric energy offered to customers under a filed rate schedule that anticipates no planned interruption. Only emergencies or force majeure by utilities can interrupt the flow of firm power.

(C) "On-peak" or "On-peak day" means 6:00:01 a.m to 10:00:00 p.m. on any day between and including Monday through Friday , excluding any day which has been designated as an "off-peak" day or a holiday by the North American Electric Reliability Council (NERC).

(D) "Force Majeure" means any circumstance (including but not limited to a strike, lockout, national emergency, government action, or act of God) which is beyond the control of the buyer or seller, and which prevents the buyer or seller from making or taking delivery of electric energy or effecting payment and which, by exercise of due diligence, the affected party could not have been reasonably expected to avoid and which, by exercise of due diligence, said party is unable to overcome.

(E) "Delivering party" means the seller providing capacity and energy to be transmitted at point(s) of receipt.

(F) "Megawatt" means one million watts.

(G) "Transmission Service Agreement" means the initial agreement and any amendments or supplements thereto entered into by the transmission customer and transmission provider for service under the Tennessee Valley Authority's Transmission Service Guidelines or any replacement thereof.

(H) "SERC" means the Southeastern Electric Reliability Council.

(I) All times referred to in these rules shall be Central Time unless otherwise specified.

5504.01 Unit of Trading - The unit of trading for TVA Hub electricity futures shall be 1,680 Megawatt hours (MWh) of firm electric energy. Bids and offers may be accepted in dollars and cents per MWh (\$/MWh) or multiples thereof.

5505.01 Months Traded - Trading in TVA Hub electricity futures may be conducted in the current month and any subsequent months as determined by the Exchange.

5506.01 Price Basis - Minimum price fluctuations shall be \$.01 per MWh. Contracts shall not be made on any other price basis.

5507.01 Hours of Trading - The hours of trading for future delivery in TVA electricity shall be determined by the Board. The market shall be opened and closed for all months simultaneously, or in such other manner as the Regulatory Compliance Committee shall direct.

5508.01 Trading Limits

(A) The maximum permissible price fluctuation in any one day shall be \$7 per MWh above or below the preceding day's settlement price for any month succeeding the nearby trading month.

(B) If one or more contract months close on limit bid for one business day or on the limit sellers for one business day, then the limit would be raised to 150 percent of the current level for all contract months and remain there for two successive business days.

If one or more contracts months close on the limit bid on the last business day of the expanded limit period or on the limit sellers on the last business day of the expanded limit period then the limits will remain at 150 percent of the original level for another two day period.

The limits would remain at 150 percent for successive periods of two business days until none of the contracts close at the limit bid or limit sellers on the last day of the period. If on the last day of a two day business period none of the contracts close on the limit bid or limit sellers then the limits would revert to their original level at the end of the two day period.

(C) There shall be no maximum limit on price fluctuation for the nearby trading contract.

5509.01 Last Day of Trading

(A) No trades in TVA electricity futures deliverable in the current month shall be made during the last three business days prior to the first calendar day of the delivery month.

(B) No participant may make or take delivery or enter into an exchange for physical transaction on the last trading day unless, prior to the opening of trading on the last trading day, its clearing member has obtained from it:

- (1) A copy of a signed written transmission service agreement or enabling agreement into (from) the TVA Control Area, and where such agreement is not for firm transmission for such participant, verification of alternative arrangements for transmission into (from) the TVA Control Area approved by the Control Area operator, such that a delivery under the terms of this Chapter may be made. The quantity of electric energy identified in such agreement(s) or arrangement(s) must be equal to or greater than the quantity required by the number of contracts that the seller will deliver; and
- (2) Written confirmation from each participant holding a long(short) position in that contract that:
 - (a) if short, the participant has generation capacity or a purchase agreement for a quantity and quality of firm electric energy sufficient to meet such participant(s) obligations to make delivery as prescribed by these Rules, and is not restricted by federal law to which parties it may sell electric energy from the Tennessee Valley Authority Control Area;

- (b) if long, the participant has load or resale commitments equal to the quantity and quality it intends to receive in delivery; and
- (c) whether short or long, such participant has a reasonable basis to believe that transmission service will be available to satisfy the needs of the participant.

(C) If a clearing member fails to obtain the documents required to be furnished by a participant by paragraph (B) hereof, the clearing member shall liquidate all open long or short positions for which such documents have not been obtained by entering a market order at least one hour prior to the beginning of the close of trading on the last day of trading without liability to the owner or controller of such position.

(D) An open position may be liquidated by a bona fide exchange for physical for the actual commodity, no later than 11 a.m. on the first business day following the last day of trading. Participants holding a short (long) position in the expiring month after the close of trading on the day before last trading day and planning to execute an EFP are subject to the requirements of paragraph (B).

(E) Any party that is restricted by federal law to which parties it may sell electric energy from the Tennessee Valley Authority Control Area, may not give notice for delivery, or participate in an exchange for physical transaction involving the sale of electric energy to parties to whom it is restricted to sell to, and must liquidate all short positions prior to the expiration of trading. Notwithstanding any provision of these Rules, the clearing member of a party subject to such a restriction shall liquidate all open short positions of that party by entering a market order at least one hour prior to the beginning of the close of trading on the last day of trading without liability to the owner or controller of such position.

5510.01 Margin Requirements - (See CBOT Regulation 431.03)

5511.01 Position Limits and Reportable Positions - (See CBOT Regulation 425.01)

5536.01 Standards - The contract grade for delivery on futures contracts made under these Regulations shall be firm electric energy in the form of three phase current alternating at a nominal frequency of 60 hertz, and be in conformance within the specifications of Southeastern Electric Reliability Council (SERC) as well as all applicable Federal, State, and Local laws and regulations. The seller shall provide firm electric energy which is free from all liens, encumbrances, unpaid taxes, fees and other charges.

5537.01 Date of Delivery -Participants holding a short position in the expiring month after the close of trading on the last trading day and who do not execute an EFP pursuant to Regulation 5509.01, are obligated to perform delivery pursuant to either Regulation 5543.06, 5543.07 or 5543.08.

5543.01 Delivery Notices - (See CBOT Regulation 1047.01)

5543.02 Time and Issuance of Delivery Notices - (See CBOT Regulation 1049.01)

5543.03 Buyer's Report of Eligibility to Receive Delivery - (See CBOT Regulation 1049.02)

5543.04 Clearing Member Firms' Obligations - Upon receipt of the name of the respective long clearing member (buyer) obligated to accept delivery from him, the short clearing member shall contact the long clearing member to which it has been assigned to decide upon the equitable allocation of the positions. Following the equitable allocation of the assigned positions, the short clearing member firm shall prepare invoices addressed to its assigned long clearing member firms. Both the long and short clearing member firm must immediately communicate to their customers the name of the party to whom it has been matched. The respective clearing

member firm shall provide authorized official contract names and telephone numbers for the Long and the Short to communicate so that the Short can make the required transmission arrangements to deliver electric energy, and the Long can make the required arrangements to receive electric energy.

5543.05 Method of Delivery - (See CBOT Regulation 1048.01)

5543.06 Time of Delivery, Payment, Delivery Procedures

(A) For the purpose of this Chapter,

- (1) "Payment Date" shall mean the twenty-fifth (25) calendar day of the month following the delivery month. If such date is a Saturday or an Exchange or federal banking holiday other than Monday, payment shall be made on the preceding business day which is not an Exchange or federal banking holiday. If such a day is a Sunday or an Exchange or federal banking holiday which occurs on a Monday, payment shall be made on the next business day which is not an Exchange or federal banking holiday.
- (2) "Long" shall mean the owner of a long position.
- (3) "Short" shall mean the owner of a short position.
- (4) "Failure to Perform" shall mean the failure of the Short to make or the Long to receive delivery of firm electric energy in accordance with the requirements set forth in these Rules.

(B) On every on-peak day of the delivery month, delivery terms shall be 5 megawatts starting with the hour beginning at 6:00:01 a.m. and ending at 10:00:00 p.m. Central time. The following schedule shall be used to determine the delivery unit in months having on-peak days as set forth below:

1,520 MWh for delivery months with 19 on-peak days
1,600 MWh for delivery months with 20 on-peak days
1,680 MWh for delivery months with 21 on-peak days
1,760 MWh for delivery months with 22 on-peak days
1,840 MWh for delivery months with 23 on-peak days.

Delivery shall be made by any one or combination of the following methods:

- (1) By delivery into the TVA transmission system. The Short's and Long's obligations shall be defined as follows:
 - (a) The Short is required to deliver firm electric energy into the TVA transmission system at any interface designated by the Short that is available to the Long. The Short's designated interface may change for each respective delivery day in the delivery month.
 - (b) The Long's confirmed transmission request recorded on TVA's Open Access Same Time Information System (OASIS) shall be the determination of transmission service availability. The Long shall notify the Short of a confirmed transmission request subject to the request deadline for transmission service.

- (c) If the interface point designated by the Short is not available for the Long, then the Short shall be required to make one of the following designations to the Long: (1) an alternate interface point for which transmission service is available to the Long, or (2) generation inside of the TVA Control Area that is lawfully available.
 - (d) The Short is responsible for transmission service required to deliver energy from the generating source to any TVA interface. The Short is not responsible for transmission service within the TVA transmission system. The Long has the obligation to receive firm electric energy at the TVA interface designated by the Short and is responsible for transmission service within the TVA transmission system.
- (2) All or part of a standard delivery obligation can also be made by book transfer, provided that the Long and Short mutually agree to such transfer. For purposes of this regulation, a book transfer is defined as a book adjustment effecting a title transfer between the Long and Short which involves the offset of a delivery obligation by a cash market obligation.

(C) Delivery shall commence no earlier than the first on-peak day of the delivery month. Delivery shall be completed no later than the last on-peak day of the delivery month.

(D) On the second business day following the last day of trading, the long clearing member shall obtain from the Long, margin equal to the full value of the electric energy to be delivered. The full value of the electric energy shall be the final contract settlement price multiplied by 5 megawatts rate multiplied by 16 hours per delivery day multiplied by the number of delivery days in the delivery month multiplied by the number of contracts delivered. The short clearing member shall obtain from the Short margin in the amount fixed, from time to time, by the Exchange. The long clearing member and the short clearing member shall deposit with the Clearing House margins in the amount and in such form as required by the Clearing House. Such margins, shall be returned on the first business day following notification to the Exchange and the Clearing House that delivery and payment have been completed.

(E) No later than 12:00 o'clock noon Central time on the third business day prior to the Payment Date, the Short shall advise the short clearing member of the name and address of the bank, and the name of the bank account to which payment shall be made. The short clearing member shall advise the long clearing member who shall advise the Long. On the Payment Date, the Long shall pay the Short by federal funds wire transfer to the account of the short at the bank nominated by the Short by 3 p.m. Central Time. No later than 12:00 noon Central time the Long shall advise the long clearing member and the short clearing member who shall similarly advise the Short of the federal funds wire transfer number and the name of the sending bank.

(F) No later than the first business day following the Payment Date, the Short, shall advise the short clearing member of receipt of payment and provide proof of execution of the schedule by the relevant control area operators. The short clearing member shall deliver a notice of payment to the long clearing member with a copy to the Clearing House no later than the first business day following the Payment Date. Receipt of such notice by the long clearing member, along with proof of execution of the schedule by the relevant control area operators, shall constitute proof of delivery and title transfer.

- (1) Any payment made on the Payment Date shall be based on electric energy actually delivered.
- (2) Force Majeure is the only exception for late performance of above described delivery terms. An Exchange committee shall be authorized to resolve disputes relating to a failure to perform or Force Majeure.

(G) If a dispute relating to the performance of delivery obligations arises, the dispute shall be referred to the appropriate Exchange committee for resolution.

(H) The Long's clearing member firm shall be responsible for any failure to perform by the Long. The Short's clearing member firm shall be responsible for any failure to perform by the Short. Neither the Exchange nor the Clearing House shall be liable for any loss, cost or expense arising from the failure of a Long or its clearing member or a Short or its clearing member to perform any of their respective delivery obligations under the provisions of this chapter.

(I) Participants making or taking delivery of electric energy pursuant to these Rules shall adhere to the applicable scheduling and transmission procedures and practices of SERC, TVA Control Area, and FERC.

5543.07 Delivery by mutual agreement

Upon mutual agreement, in writing, the Long and the Short may amend provisions of Regulation 5543.06(B) related to Delivery Rate and Regulation 5543.06(C) related to Timing of Delivery, except that no amendment shall be permitted that would allow the delivery to take place outside the delivery month.

These amendments must be filed with the Long and Short's respective clearing members.

5543.08 Alternative Delivery Procedure

The Short (Long) may agree with the Long (Short) with which it has been matched to make and take delivery under terms or conditions which differ from the terms and conditions prescribed in this Chapter. If agreed upon, the respective Clearing Members must execute an Alternative Delivery Notice on the official form prescribed by the Exchange and shall deliver a completed executed copy of such Notice to the Clearing House. The delivery of an executed Alternative Delivery Notice to the Clearing House shall release the clearing members and the Clearing House from their respective obligations under this Chapter. The filing of such a notice allows the Long and the Short to negotiate mutually acceptable terms for the settlement of the obligation.

By executing such Notice, the Long and the Short shall indemnify their respective clearing members, the Exchange and the Clearing House from any claim, loss, liability, cost or expense arising from the execution, delivery or performance of such contracts or such agreement, or any breach thereof or default thereunder. Upon receipt of an executed Alternative Delivery Notice, the Clearing House will return to the clearing members all margin monies held for the account of each with respect to the contracts involved.

Chapter 56 TVA Hub Electricity Options on Futures Trading Conditions

5601.00 Authority - (See Rule 2801.00).

5601.01 Application of Regulations - Transactions in put and call options on TVA Hub Electricity futures contracts shall be subject to the general rules of the Association as far as applicable and shall also be subject to regulations contained in this chapter which are exclusively applicable to trading in put and call options on TVA Hub Electricity futures contracts (see Rule 490.00).

5602.01 Nature of TVA Hub Electricity Futures Put Options - The buyer of one (1) TVA Hub Electricity futures put option may exercise his option at any time prior to expiration (subject to Regulation 5607.01), to assume a short position in one (1) TVA Hub Electricity futures contract of a specified contract month at a striking price set at the time the option was purchased. The seller of one (1) TVA Hub Electricity futures put option incurs the obligation of assuming a long position in one (1) TVA Hub Electricity futures contract of a specified contract month at a striking price set at the time the option was sold, upon exercise by a put option buyer.

5602.02 Nature of TVA Hub Electricity Futures Call Options - The buyer of one (1) TVA Hub Electricity futures call option may exercise his option at any time prior to expiration (subject to Regulation 5607.01), to assume a long position in one (1) TVA Hub Electricity futures contract of a specified contract month at a striking price set at the time the option was purchased. The seller of one (1) TVA Hub Electricity futures call option incurs the obligation of assuming a short position in one (1) TVA Hub Electricity futures contract of a specified contract month at a striking price set at the time the option was sold, upon exercise by a call option buyer.

5603.01 Trading Unit - One (1) TVA Hub Electricity futures contract of a specified contract month on the Chicago Board of Trade.

5604.01 Striking Prices -Trading shall be conducted for put and call options with striking prices (the "strikes") in integral multiples of one dollar per megawatt hour per TVA Hub Electricity futures contract (i.e., 18.00, 19.00, 20.00, etc.), the "first tier"; and in integral multiples of two dollars \$ 2.00 per megawatt hour per TVA Hub Electricity futures contract (i.e., 22.00, 24.00, 26.00, etc.), the "second tier" as follows:

- (1) (a) Per the first tier, at the commencement of trading for an option contract, the following strikes shall be listed: one with a strike closest to the previous day's settlement price of the underlying TVA Hub Electricity futures contract, the next twenty consecutive higher strikes and the next twenty consecutive lower strikes (the "initial band"). If the previous day's settlement price is midway between two strikes, the closest price shall be the larger of the two.
- (b) Per the second tier, at the commencement of trading for an option contract, the following strikes shall be listed: the next ten consecutive strikes above and the next ten consecutive strikes below the initial band.
- (c) Per the first tier, over time, strikes shall be added as necessary to insure that at least twenty strikes above and below the previous day's trading range of the underlying futures are listed (the "minimum band").
- (d) Per the second tier, over time, strikes shall be added as necessary to insure that the next ten consecutive strikes above the minimum band the next ten consecutive strikes below the minimum band are listed.

- (e) No new strikes may be added by these procedures in the month in which an option expires.
- (2) (a) Per the second tier, all strikes in which the previous day's delta factors (as determined by the Board of Trade) for both the put and call options are 0.10 or greater for two consecutive business days will be listed for trading. However, no new strikes may be added by this procedure to an option month unless open positions exist in that contract month.
- (b) Per the first tier, during the month in which an option expires, all strikes in which the previous day's delta factors (as determined by the Board of Trade) for both the put and call options are 0.10 or greater for two consecutive business days will be listed for trading.
- (3) All strikes will be listed prior to the opening of trading on the following business day. The Exchange may modify the procedures for the introduction of strikes as it deems appropriate in order to respond to market conditions.

5605.01 Payment of Option Premium - The option premium must be paid in full by each clearing member to the Clearing House and by each option customer to his commission merchant at the time the option is purchased, or within a reasonable time after the option is purchased.

5606.01 Option Premium Basis - The premium for TVA Hub Electricity futures options shall be in multiples of one-half of one cent per megawatt hour (\$8.40 per contract). Contracts shall not be made on any other basis.

However, when both sides of the trade are closing transactions, the option premium may range from \$1.00 to \$8.00 in \$1.00 increments per option contract.

5607.01 Exercise of Option - The buyer of a TVA Hub Electricity futures option may exercise the option on any business day prior to expiration by giving notice of exercise to the Clearing Corporation by 6:00 p.m. (Central time) on such day.

5607.02 Automatic Exercise - Notwithstanding the provisions of Regulation 5607.01, after the close on the last day of trading, all in-the-money options shall be automatically exercised, unless notice to cancel automatic exercise is given to the Clearing Corporation.

Notice to cancel automatic exercise shall be given to the Clearing Corporation by 6:00 p.m. (Central time) on the last day of trading.

5608.01 Expiration of Option - Unexercised TVA Hub Electricity futures options shall expire at 6:00 p.m. (Central time) on the last day of trading.

5609.01 Months Traded - Trading may be conducted in TVA Hub Electricity futures options in the same months that are listed for trading in the TVA Hub Electricity futures contracts, provided however that the Exchange may determine not to list a contract month. There shall be no trading in TVA Hub Electricity futures options for months in which the TVA Hub Electricity futures are not traded on the Chicago Board of Trade.

5610.01 Trading Hours - The hours of trading options on TVA Hub Electricity futures shall be determined by the Board. On the last day of trading in an expiring option, the closing time for such options shall

be 12:00 noon, subject to the provisions of the second paragraph of Rule 1007.00. On the last day of trading in an expiring option, the expiring TVA Hub Electricity futures options shall be closed with a public call made striking price by striking price, conducted by such persons as the Regulatory Compliance Committee shall direct. On all other days, TVA Hub Electricity futures options shall be opened and closed for all months and striking prices simultaneously or in such a manner as the Regulatory Compliance Committee shall direct.

5611.01 **Position Limits** - (See Regulation 495.01).

5612.01 **Margin Requirements** - (See Regulation 431.05).

5613.01 **Last Day of Trading** - No trades in TVA Hub Electricity futures options expiring in the current month shall be made after 12:00 noon on the business day immediately preceding the expiration of the underlying futures contract.

5614.01 **Option Premium Fluctuation Limits** - Trading is prohibited during any day except for the last day of trading in TVA Hub Electricity futures options at a premium of more than the trading limit for the TVA Hub Electricity futures contract above and below the previous day's settlement premium for that option as determined by the Clearing Corporation. On the first day of trading, limits shall be set from the lowest premium of the opening range.

Appendix II

Forward Electricity Prices

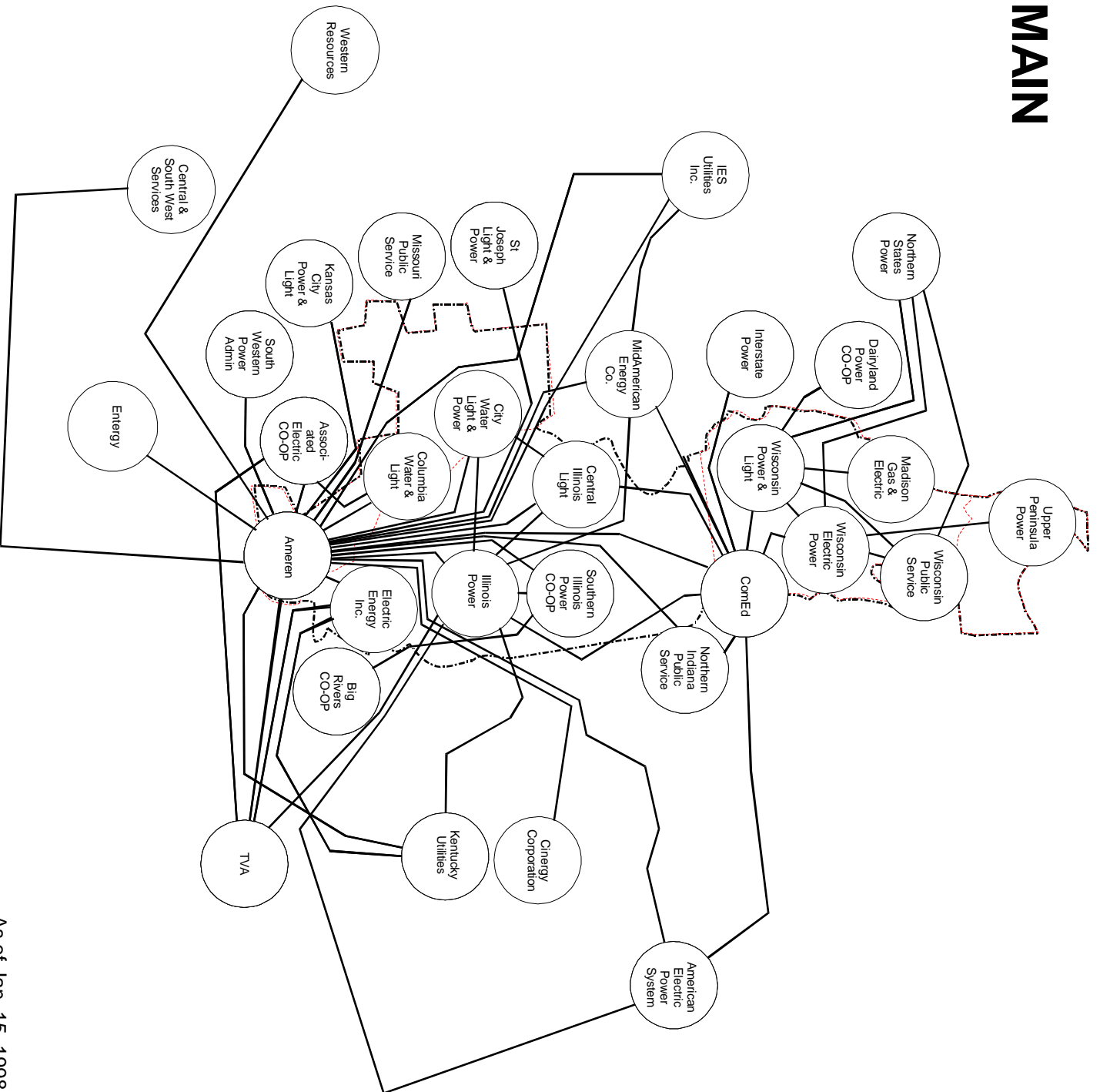
Into ComEd Hub 1-Month Forward Electricity Prices
Into TVA Hub 1-Month Forward Electricity Prices

Appendix III

Interconnection Maps

MAIN Interconnection Map
SERC Interconnection Map

MAIN



Appendix IV

Definitions

Baseload	The minimum amount of electric power delivered or required over a given period of time at a steady rate.
Baseload Capacity	The generating equipment normally operated to serve loads on an around-the-clock basis.
Busbar	The point at which power is available for transmission. A conductor, or group of conductors, that serve as a common connection for two or more circuits, generally in the form of insulated cable, rigid rectangular or round bars, or stranded overhead cables held under tension. The equivalent, in electric power terms, of the gas plant tailgate.
Business Day	As determined by the North American Electric Reliability Council (NERC) and differs for each reliability council. The business day typically begins 07:00:01 a.m. EST for a 24-hour period. Holidays are also determined by NERC and are separate from U.S.-designated holidays.
Capacity	The maximum load that a generating unit or generating station can carry under specified conditions for a given period of time without exceeding approval limits of temperature and stress.
Capacity (purchased)	The amount of energy and capacity available for purchase from outside the system.
Capacity	The rated load-carrying capability of electrical equipment, such as generators or transmission lines, typically expressed in megawatts.
Cogenerator	A generating facility that produces electricity and another form of useful thermal energy (such as heat or steam) used for industrial, commercial, heating, or cooling purposes.

ComEd Transmission System	The facilities owned, controlled, or operated by the transmissions provider that are used to provide service under the Commonwealth Edison Open Access Transmission Tariff.
Control Area	A large geographic area within which a utility (or group of utilities) regulates electric power generation in order to maintain scheduled interchanges of power with other control areas and to maintain the required system frequency.
Control Area Operator	An electric entity that operates generating capacity to meet area demand, monitors actual interchange (electric energy flowing between control areas), and can dispatch generating resources to ensure that actual interchange equals scheduled interchange.
Cooperative	A group organized under law into a utility company that will generate, transmit, and/or distribute supplies of electric energy to a specified area not being serviced by another utility. Typically, a co-op is not for profit.
Coordination Transactions	Short-term transactions undertaken primarily to maintain system integrity.
Contract Unit (Eastern Electricity Futures)	The contract unit for ComEd Hub and TVA Hub shall be 1,680 megawatt hours (MWh) of firm on-peak electric energy (5 MW*16 hrs./day*21 Contracts) days/month).
Delivery Point	Where customers in a contractual transaction are obligated to make or take delivery of power.
Delivery Period	Delivery takes place during the 16 on-peak hours on each business day of the delivery month.
Delivery Unit	The delivery unit of the futures contract is determined by the number of days in the delivery month: 19 on-peak days, delivery unit is 1,520 MWh 20 on-peak days, delivery unit is 1,600 MWh 21 on-peak days, delivery unit is 1,680 MWh 22 on-peak days, delivery unit is 1,760 MWh 23 on-peak days, delivery unit is 1,840 MWh
Dissipation	The loss of megawatts due to the movement of power across the system.
Distribution	The portion of the transmission and facilities of an electric system off the bulk power system that is dedicated to delivering electric service to the end-user sector.

Eastern On-Peak	The load during a specific period of time. Refers to the hours of the business day when demand is at its peak. The eastern markets trade a 16-hour (5 by 16), on-peak day Monday through Friday,.
Electric Utility	An enterprise that is engaged in generation, transmission, and/or distribution of electric energy primarily for use by the public and that is the major power supplier within a designated service area. Electric utilities include: <ul style="list-style-type: none"> a. Investor-Owned Utility (IOU) b. Publicly Owned c. Cooperatively Owned d. Government Owned (Municipals, Federal Agencies, State Projects, Public Power Systems)
End User	In wholesale markets, the end users are the industrial sector which is comprised of manufacturing, mining, construction, agriculture, fisheries, and forestry.
Exchange Transactions	Transactions between different regions and/or parties that are not priced.
FERC	Federal Energy Regulatory Commission. The U.S. government body whose responsibilities include the regulation of the interstate electricity sales and rates.
Firm Energy	The highest quality sales of transmission service offered to customers under a filed rate schedule that anticipates no planned interruption.
Generation	The process of producing electric energy by transforming other forms of energy. The amount of energy produced, expressed in watt hours (Wh).
Gigawatt (GW)	One billion watts.
Hub	A geographical location where multiple participants trade services.
Imbalance Energy	Discrepancy between the amount a seller contracted to deliver and the actual volume of power delivered. Imbalances are resolved through monetary payment.
Inadvertent Energy	The imbalance of energy flows back and forth that are ongoing and on a routine basis between generator and load. These imbalances are typically settled through physical commodity exchange.
Independent Power Producer (IPP)	A nonutility power generating company that is not a qualifying facility (QF).

Industry Participants:	See Cogenerator, Cooperative, Electric Utility, End User, Independent Power Producer, Municipality, Power Marketer, and Qualifying Facility.
Into	Demarcates seller and buyer responsibility. Sellers are responsible for the transmission service required to deliver energy from the generating source to any ComEd or TVA interface, but not for transmission service within the ComEd or TVA transmission system. Buyers are obliged to receive firm electric energy and are responsible for transmission service within the ComEd or TVA transmission system.
Kilowatt (kW)	Amount of electricity needed to light 10 100-watt light bulbs for a one-hour period, or 1,000 watts (see Unit of Measure Equivalent for Electricity).
Load	The amount of power carried by a utility system or subsystem, or the amount of power consumed by an electric device at a specified time. Load is also referred to as demand.
Load Following	A generator's daily varying of generation output to meet system load.
MAIN	Mid-America Interconnected Network.
Megawatt (MW)	One million watts.
Municipality	A city, county, irrigation district, drainage district, or political subdivision or agency of a state component under the laws thereof to carry on the business of developing, transmitting, and/or distributing power. Typically, a municipality is not-for-profit; however, profits may be returned to customers or used internally.
Non-Firm Energy	The quality sales of transmission service offered to customers that anticipates possible planned and unplanned interruption and flexibility of delivery.
NERC	North American Electric Reliability Council: An industry group formed by utilities in 1968 to promote the reliability and adequacy of bulk power supply in its 10 regional councils, encompassing the contiguous United States, Canada, and Mexico. The NERC regions are:

ASCC - Alaskan System Coordination Council
 ECAR - East Central Reliability Coordination Agreement
 ERCOT - Electric Reliability Council of Texas
 MAIN - Mid-America Interpool Network
 MAAC - Mid-Atlantic Area Council
 MAAP - Mid-Continent Area Power Pool
 NPCC - Northeast Power Coordinating Council

SERC - Southeastern Electric Reliability Council
SPP - Southwestern Power Pool
WSCC - Western System Coordinating Council

OASIS	Open Access Same-time Information System. An electronic information system that FERC requires all transmission operators to create or participate in to provide transmission customers with nondiscriminatory information about available capacity, prices, and other information.
On-peak	The loading during a specific period of time. Refers to hours of the business day when demand is at its peak. In the physical market, on-peak definitions vary by NERC region.
Off-peak	The load for the remaining hours that are not on-peak.
Outages (Planned and Forced)	A planned outage is the shutdown of a generating unit, transmission line, or other facility inspection and maintenance in accordance with an advance schedule. A forced outage is the unplanned service of a generating unit, transmission line, or other facility for purposes other than inspection and maintenance. Usually, forced outages occur when utilities are unable to generate. Reasons for forced outages include damage to equipment due to weather or unforeseen system malfunction.
Peak Period	Periods when energy consumption is the highest.
Power Marketer	A wholesale power entity that has registered with FERC to buy and sell wholesale power with other public entities at market-derived prices. Power marketing companies include IOU-affiliated companies, gas marketing companies, financial intermediaries, IPPs, and entrepreneurs. Typically, power marketers do not own generating facilities.
Preschedule	The act of buyer and seller arranging in advance to deliver electricity, usually 24 hours in advance.
Qualifying Facility (QF)	A generator of small power that meets certain ownership, operating, and efficiency criteria established by the Federal Energy Regulatory Commission (FERC) pursuant to the PURPA and has filed with the FERC for QF status or self-certified. QFs are physical generating facilities.
Ramping	The time it takes for a generation unit to achieve full rated output.
Requirement Transactions	Longer-term transactions for firm power delivery.

Resource	The amount of available generation capacity, or purchased power.
Retail	Sale of electricity to the ultimate users.
SERC	Southeastern Electric Reliability Council.
Schedule	The act of buyer and seller arranging to deliver electricity.
Security Center	Group responsible for maintaining reliability over a control area or group of control areas.
System Operation Center	Center where the status of generation units is monitored and decisions are made to start and stop particular units based on economic and reliability factors.
Substation	An assemblage of equipment that switches, changes, or regulates voltage in the electric transmission and distribution system.
Tolling	An arrangement whereby a party moves fuel to a power generator and receives kilowatt hours (kWh) in return for a preestablished fee.
Transmission	The transmission system carries the electricity from generating plants to the load. It can operate at low voltage, high voltage, or extra-high voltage. The available transmission capacity varies through time, based on the number and size of the physical transactions.
Utility System Delivery	This commercial practice allows a seller to initially determine the utility system transmission interface to be used for the sale of power to a buyer. The seller's designated interface refers to an interconnection with a neighboring utility system or to an internal generation or transmission node within the designated utility system.
Wheeling	The carriage of electricity from one supplier across the transmission lines of an intermediate utility for delivery to a third party.
Wholesale	Electricity sales for resale, sales from one utility to another, or sales from a generating company to a power marketer.

Appendix V

Electricity Informational References

For weather information:

National Weather Service. Will provide information on weather patterns across the United States:

516-869-6347 or www.nwsfo.atmos.albany.edu/www/wx.html

For information on spot and forward market activity, fuel price trends, or general industry items of interest:

News Service	Telephone	Subscription	Internet Address
Number	Number		
Bloomberg	212-893-3642	800-338-2749	www.bloomberg.com
Bridge	212-372-7117	800-526-3282	www.bridge.com
Dow Jones-Telerate	212-390-6050	800-334-3813	www.dowjones.com
Platts Electricity Alert	212-512-4289	800-459-6521	www.platts.com
Reuters	212-859-1850	800-435-0101	www.reuters.com

For information on power generation plant availability (i.e., forced outages, maintenance shut-downs, refueling schedules):

Publication	Telephone	Subscription	Internet Address
	Number	Number	
<i>California Energy Market</i>	206-285-4848	206-285-4848	www.newsdata.com
<i>Electric Perspectives</i>	703-751-9864	202-508-5464	
<i>Electric Power</i>	713-993-9320	800-832-1917	www.hartpub.com
<i>Energy Market Report</i>	503-222-2425	503-222-2425	www.econ.com
<i>Foster's Electricity Report</i>	202-408-7710	202-408-7710	
<i>Electric World</i>	212-337-4064	609-426-5567	www.mhenergy.com
<i>Power Markets Week</i>	212-512-2406	800-223-6180	www.mhenergy.com
<i>Inside FERC</i>	212-512-2406	800-223-6180	www.mhenergy.com
<i>Electric Utility Week</i>	212-512-2406	800-223-6180	www.mhenergy.com
<i>Elec. Power Daily</i>	212-512-2406	800-223-6180	www.mhenergy.com

<i>MW Markets</i>	703-528-1244	800-424-2908	
<i>Public Utilities Fortnightly</i>	703-847-7735	703-847-7720	www.pasha.com
<i>World Co-Generation</i>	212-432-7300		
<i>Megawatt Daily</i>	703-528-1244	800-424-2908	www.pasha.com

Other Important Names and Numbers:

***Edison Electric Institute.** Will sell general statistics and news on electricity:
800-EEI-5453 or www.eei.org

***Federal Energy Regulatory Commission (FERC).** Wholesale electricity demand:
202-208-0200 or www.ferc.fed.us

***North American Electric Reliability Council (NERC).** Total electricity demand:
609-452-8060 or www.nerc.com

***Energy Information Administration.** General information regarding plant generation:
202-586-8800 or infoctr@eia.doe.gov

***Department of Energy.**
202-586-8800 or www.doe.gov

Appendix VI

For Further Information

If you have questions about Chicago Board of Trade Electricity futures and options, contact:

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Colin Fitzgerald, Product Manager 312-435-3674

CBOT Electricity Product Development & Research
Eugene Kunda, Senior Economist 312-347-5528

For information about other CBOT resources, call or write for a CBOT publications catalog:

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Publications Department
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Chicago, IL 60604-2994
312-341-3168
<http://www.cbot.com>

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