Bank of China

Power Finance:
Issues Facing CFOs in the Power Industry

Dr. Ian Giddy
New York University

Issues Facing CFOs

- Economics: Pricing Pressures
- Mergers & Acquisitions: Valuation Issues
- Financing: Cost and Availability of Capital
- Cash Management: Mismatch Problems
- Risk Management: Hedging Techniques

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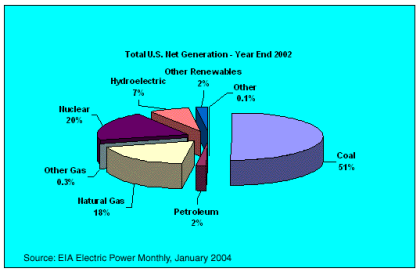
Power in the USA – How it is Fueled



Source: EIA Electric Power Monthly, January 2004

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Coal: Dirty But Cheap?

	$ / Mwh	$ / Mwh	$ / Mwh
Date	Gas	Oil	Coal
2000	$31.12	$33.06	$15.23
2001	$34.16	$27.02	$15.96
2002	$25.76	$27.85	$14.39
2003	$43.12	$34.07	$15.23

Based on gas and oil heat rate of 8,000, coal heat rate of 10,500.

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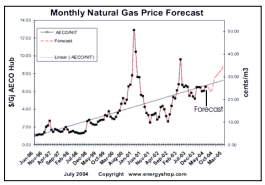
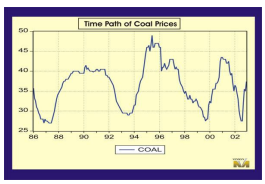
Fuel Costs Rising…





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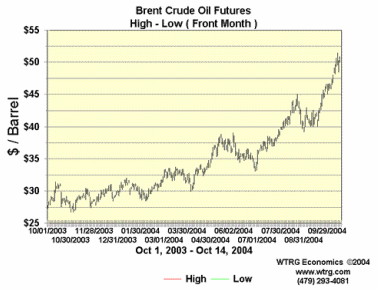
Fuel Costs Rising…



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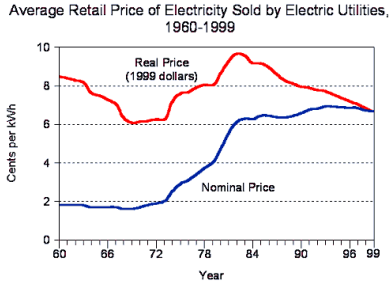
…With Electricity Prices Falling…



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…Led to The New Competitive Sector

- Since 1992, the face of the electric power industry has changed dramatically. No longer is it made up exclusively of regulated monopolies created to do it all — generate, transmit, distribute and sell power within a clearly defined geographic region.
- Now, a significant portion of the industry is made up of companies that must compete in order to survive, particularly in power generation and wholesale and retail energy marketing and energy services.
- These changes have given rise to a whole class of competitive power suppliers. They now supply over 30% of the market.

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Current Industry Trends

- Asset valuations negatively affected by overcapacity in some regions.
- High gas prices currently making gas plants uneconomical
- Retail environment still not liquid as only 20 states are slowly implementing retail choice
- High gas costs and low power prices continuing to pinch spark spreads
- Limited capacity additions for the 2004-2006 period coupled with a recovering US economy should lead to a recovery in the power market for 2006-2007 period

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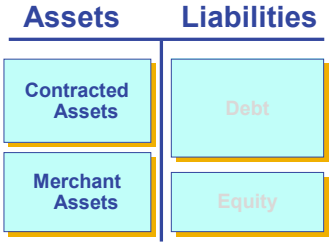
M&A Valuation Issues: Assets



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M&A Valuation Issues: Assets

- **Contracted assets** are those with power off take agreements. Typically there is a fixed capacity payment received each month which is meant to cover debt service and major maintenance costs associated with the equipment, plus room for profitability. There is a variable component for O&M, and a fuel pass through component based upon a heat rate. If an owner can operate the plant more efficiently than the amount passed through for O&M, and manage fuel so that the actual cost of fuel is less than the amount passed through pursuant to the off take agreement, additional profitability can be achieved.
- **Merchant assets** are those with no power off take agreement. Energy is sold at a market price. More profit is possible if costs can be kept down. There is significant risk in volatility of both the price of power in the open market and the price of fuel. Although coal has been inexpensive for commodity, the transportation costs are high.

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M&A Valuation Issues: Liabilities

- High level of borrowings ("leverage")
- Off balance sheet liabilities such as performance guarantees
- Costs related to environmental compliance is an issue, particularly with coal plants
- High insurance costs
- Many credit agreements have cash sweeps in place which block cash distributions if covenants are not met. Examples:
  - debt service ratios
  - debt service and maintenance reserve funding
  - high levels of reporting and compliance.

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Current Valuations

Company	Ticker	Analyst Rating	Price 23-Sep-04	Shares Out (Mlns.)	Market Cap (Mlns.)	Earnings Per Share 2004E	Earnings Per Share 2005E	Price / Earnings 2004E	Price / Earnings 2005E	Price/ Book (6/30/04)	EV/ EBITDA (2005E)	Current Dividend Yield (%)	Debt/Cap 2003A (%)
AES Corporation	AES	C-2-9	10.27	645	6,429	0.55	0.70	18.7x	14.7x	5.6x	7.2x	0.0%	93.3%
American Electric Power	AEP	B-2-7	32.44	396	12,814	2.25	2.40	14.4x	13.5x	1.6x	7.0x	4.3%	64.5%
Cinergy	CIN	A-1-7	39.95	190	7,111	2.60	2.85	15.4x	14.0x	1.9x	8.5x	4.7%	58.0%
Consolidated Edison	ED	A-2-7	41.63	241	9,883	2.60	2.85	16.0x	14.6x	1.4x	7.0x	5.4%	51.5%
Constellation Energy	CEG	B-1-7	39.73	169	6,694	3.25	3.50	12.2x	11.4x	1.5x	6.7x	2.9%	55.5%
DTE Energy	DTE	B-2-7	40.83	174	7,093	2.75	3.60	14.8x	11.3x	1.3x	8.6x	5.0%	59.6%
Dominion Resources	D	B-1-7	64.63	330	21,305	4.75	5.10	13.6x	12.7x	2.0x	7.9x	4.1%	58.2%
Duke Energy	DUK	C-2-7	22.42	938	21,030	1.20	1.35	18.7x	16.6x	1.4x	8.4x	4.9%	61.8%
Entergy Corp	ETR	B-1-7	59.78	227	13,609	4.15	4.70	14.4x	12.7x	1.6x	7.9x	3.2%	46.4%
Equitable Resources	EQT	B-1-7	52.79	62	3,411	3.10	3.45	17.0x	15.3x	3.6x	9.4x	2.9%	32.5%
Exelon Corp	EXC	B-1-7	36.32	660	24,008	2.75	3.00	13.2x	12.1x	2.1x	7.9x	3.4%	64.7%
FPL Group	FPL	A-1-7	67.19	185	11,624	5.30	5.70	12.7x	11.8x	1.7x	7.2x	4.0%	56.2%
FirstEnergy	FE	C-1-7	40.97	330	13,513	2.70	2.95	15.2x	13.9x	1.6x	6.9x	3.7%	58.3%
KeySpan Energy	KSE	A-2-7	38.53	140	5,417	2.30	2.35	16.8x	16.4x	1.6x	8.2x	4.6%	65.3%
PG&E Corporation	PCG	C-1-9	29.73	400	11,916	2.05	2.20	14.5x	13.5x	1.5x	5.4x	0.0%	69.1%
PPL Corporation	PPL	B-1-7	46.28	109	8,063	3.55	3.90	13.0x	11.9x	2.2x	7.6x	3.5%	72.2%
Pinnacle West	PNW	B-2-7	41.29	91	3,769	2.50	3.20	16.5x	12.9x	1.3x	7.2x	4.6%	54.6%
Progress Energy	PGN	A-2-7	42.52	247	10,460	3.60	3.60	11.8x	11.8x	1.4x	8.0x	5.4%	58.9%
Questar Corp	STR	B-1-7	47.84	84	3,983	2.50	2.80	17.1x	15.2x	2.8x	7.6x	1.9%	48.3%
Sempra Energy	SRE	B-1-7	35.91	231	7,685	3.10	3.15	11.6x	11.4x	2.0x	8.3x	2.8%	70.6%
Southern Company	SO	A-2-7	29.87	738	22,049	2.00	2.10	14.9x	14.2x	2.2x	8.4x	4.8%	48.9%
Southern Union Company	SUG	C-1-9	19.90	77	1,433	1.30	1.29	15.3x	15.4x	1.5x	8.7x	0.0%	69.7%
TECO Energy	TE	C-3-8	13.03	199	2,450	0.90	0.95	14.5x	13.7x	1.6x	7.5x	5.8%	67.1%
Wisconsin Energy	WEC	A-2-7	31.53	118	3,689	2.30	2.40	13.7x	13.1x	1.5x	8.7x	2.7%	61.6%
Xcel Energy	XEL	B-2-7	17.35	399	6,919	1.20	1.30	14.5x	13.3x	1.3x	6.7x	4.7%	56.1%

Source: Merrill Lynch

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Current Valuations by Individual Project

- Current valuations for assets in Mirant Corp Portfolio per kilowatt
  - $250/kw for western gas and oil plants
  - $180/kw for northeast assets
  - $500/kw for mid Atlantic assets due to base load coal assets with low operating costs and location within PJM.
  - $155/kw for mid-continent fleet due to the fact that these assets are peakers located in markets with negative spark spreads
- Centerpoint's Texas Genco spin-off was a good comparable for the power industry at $260/kw

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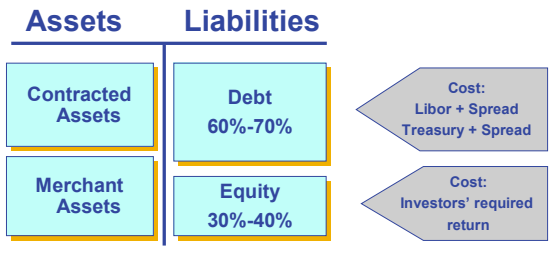
Cost of Financing



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Commercial Bank Lending

- The commercial bank market for utilities is extremely favorable
- Long dated maturities (5 yrs) available for holding companies to be used for acquisition financing. Most recent deals have been oversubscribed.
- Pricing has come in after topping out in 2001 and 2002.
- Investment banks have replaced European and Japanese banks that left the sector in 2001 and 2002
- Low treasuries and spreads have pushed many Sponsors to the bond market
- B-Loan lenders are stepping up for projects

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Alternatives to Banks: Bond Markets and More

- Merchants, distressed utilities and certain projects have tapped the high yield and B-loan markets in 2003 and 2004 YTD. Proceeds have been used to refinance current maturities.
- Sponsors have been using high yield and B-loan markets as acquisition currency.
- High yield and B-loan markets are now sole source of capital for non investment grade credits.
- High yield investors now understand regulated and merchant power business models.
- Non-traditional lenders including insurance companies and hedge funds.
- Credit spreads for new issuance have tightened significantly in the past year

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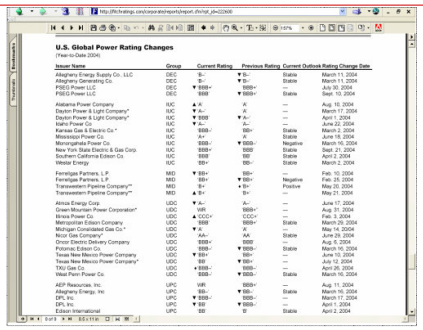
Ratings and Cost


U.S. Global Power Rating Changes
(Year-to-Date 2004)

Issuer Name	Group	Current Rating	Previous Rating	Current Outlook	Rating Change Date
Allegheny Energy Supply Co., LLC	DEC	B-	B-	Stable	March 11, 2004
Allegheny Generating Co.	DEC	B+	B+	Stable	March 11, 2004
PSEG Power LLC	DEC	BBB+	BBB+	—	July 30, 2004
PSEG Power LLC	DEC	BBB	BBB	Stable	Sept. 10, 2004
Alabama Power Company	IUC	A	A	—	Aug. 10, 2004
Dayton Power & Light Company*	IUC	A-	A	—	March 17, 2004
Dayton Power & Light Company*	IUC	BBB	A-	—	April 1, 2004
Idaho Power Co.	IUC	A-	A-	—	June 22, 2004
Kansas Gas & Electric Co.*	IUC	BBB-	BB+	Stable	March 2, 2004
Monongahela Power Co.	IUC	BBB-	BB+	Stable	March 10, 2004
Monongahela Power Co.	IUC	BBB-	BBB-	Negative	March 10, 2004
New York State Electric & Gas Corp.	IUC	BBB+	BBB	Stable	Sept. 21, 2004
Southern California Edison Co.	IUC	BBB	BB	Stable	April 2, 2004
Westar Energy	IUC	BB+	BB-	Stable	March 2, 2004
Ferrellgas Partners, L.P.	MID	BB+	BB+	—	Feb. 10, 2004
Ferrellgas Partners, L.P.	MID	BB+	BB+	Negative	Feb. 25, 2004
Transwestern Pipeline Company**	MID	B+	B+	Positive	May 20, 2004
Transwestern Pipeline Company**	MID	B+	B+	—	May 21, 2004
Almeda Energy Corp.	UDC	A-	A-	—	June 17, 2004
Green Mountain Power Corporation*	UDC	WR	BBB+	—	Aug. 31, 2004
Illinois Power Co.	UDC	CCC+	CCC+	—	Feb. 3, 2004
Metropolitan Edison Company	UDC	BBB	BBB+	Stable	March 29, 2004
Michigan Consolidated Gas Co.*	UDC	A	A	—	May 14, 2004
Nicor Gas Company*	UDC	AA-	AA	Stable	June 29, 2004
Orcor Electric Delivery Company	UDC	BBB-	BBB	—	Aug. 9, 2004
Orcor Energy LLC	UDC	BBB-	BBB-	Stable	March 29, 2004
Texas New Mexico Power Company	UDC	BB+	BB+	—	June 10, 2004
Texas New Mexico Power Company*	UDC	BB	BB+	—	July 12, 2004
TXU Gas Co.	UDC	BBB-	BBB-	—	April 26, 2004
West Penn Power Co.	UDC	BBB-	BBB-	Stable	March 10, 2004
AEP Resources, Inc.	UPC	WR	BBB+	—	Aug. 11, 2004
Allegheny Energy, Inc.	UPC	BB-	BB-	Stable	March 10, 2004
DPL Inc.	UPC	BBB-	BBB-	—	March 2, 2004
DPL Inc.	UPC	BB	BBB-	—	April 7, 2004
Edison International	UPC	BB	B	Stable	April 2, 2004

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Ratings and Cost

Reuters Corporate Spreads for Utilities

Spreads compiled using: Reuters Evaluators | Refresh | Download spread file

Rating	1 yr	2 yr	3 yr	5 yr	7 yr	10 yr	30 yr
Aaa/AAA	1	1	3	9	12	17	38
Aa1/AA+	5	5	10	25	27	31	51
Aa2/AA	10	11	16	27	32	42	60
Aa3/AA-	15	18	22	32	40	56	75
A1/A+	18	23	25	45	50	71	77
A2/A	21	23	27	51	54	75	83
A3/A-	30	34	40	57	67	75	101
Baa1/BBB+	44	54	60	79	82	91	111
Baa2/BBB	57	65	74	89	93	116	128
Baa3/BBB-	63	81	86	97	105	128	136
Ba1/BB+	315	387	370	302	245	275	230
Ba2/BB	325	350	375	305	205	210	260
Ba3/BB-	305	330	350	325	220	265	320
B1/B+	385	425	555	460	315	375	300
B2/B	515	540	605	510	320	445	470
B3/B-	590	620	710	610	470	545	620
Caa/CCC	680	750	855	810	595	620	720

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Cash Management: Dividends

- Investors expect utilities to pay out all available cash.
- Many power off take agreements have adverse working capital requirements, meaning longer periods to collect receivables, coupled with the need to pay fuel invoices within 30 days.

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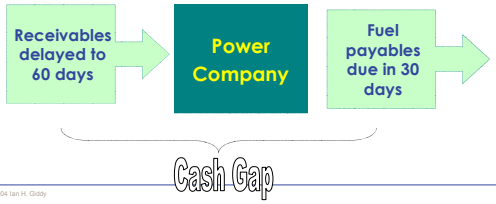
Cash Management: Mismatch

- Investors expect utilities to pay out all available cash.
- Many power off take agreements have adverse working capital requirements, meaning longer periods to collect receivables, coupled with the need to pay fuel invoices within 30 days.



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Cash Management

- Regulatory environment effect on cash: will utilities be able to pass through costs to the ratepayer?
- These costs include higher gas and coal prices, environmental compliance spending, transmission and distribution infrastructure spending, and generation additions.

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Risk Management

- Volatile commodity prices create fuel cost uncertainty
- Prices can be hedged with long term forward contracts

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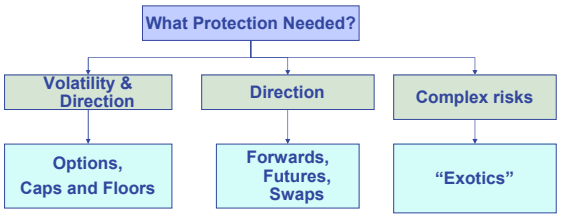
What Hedging Instruments?



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A Typical Forward Contract

- A company agrees today to pay a certain price for a commodity in the future

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A Typical Forward Currency Contract

- Sony agrees today to pay Bank of America a certain price for a currency in the future

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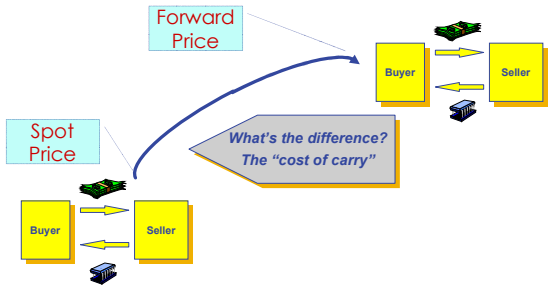
Spot and Forward Prices



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Commodity Prices

Simple model of a commodity futures price based on the cost of carry:

$$F_t = S_0(1 + R_t + C_t)^t$$

F_t = Futures price for delivery t years from today
S_0 = Spot price today
R_t = Interest rate for t years
C_t = Non-interest costs of carry.

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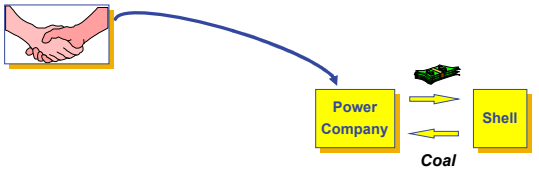
A Typical Forward Energy Contract

- A power company agrees today to pay a certain price for coal in the future



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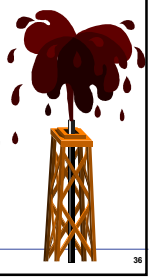
Premium for Possession

For some, a barrel of oil in the hand is worth two in the bush. This "premium for possession"` factor is called *convenience yield*:

$$F_t = S_0(1 + R_t + C_t - CY)^t$$

where CY = Convenience yield, in percent per annum



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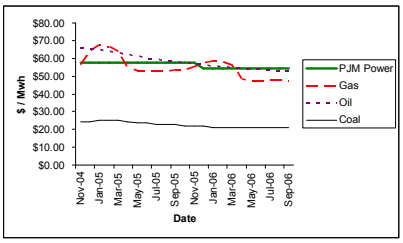
Forward Prices of Power and Fuel



Based on gas and oil heat rate of 8,000, coal heat rate of 10,500

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Forward Pricing

Date	$/Mwh PJM Power	$/Mwh Gas	$/Mwh Oil	$/Mwh Coal
Nov-04	57.5	$56.16	$65.95	$24.15
Dec-04	57.5	$64.16	$65.49	$24.36
Jan-05	57.5	$67.44	$64.78	$25.10
Feb-05	57.5	$66.80	$63.97	$25.10
Mar-05	57.5	$64.16	$63.08	$24.99
Apr-05	57.5	$54.68	$62.18	$24.36
May-05	57.5	$52.87	$61.29	$23.94
Jun-05	57.5	$53.16	$60.42	$23.63
Jul-05	57.5	$52.91	$59.61	$22.89
Aug-05	57.5	$53.05	$58.86	$22.89
Sep-05	57.5	$53.36	$58.18	$22.89
Oct-05	57.5	$53.52	$57.54	$22.16
Nov-05	57.5	$55.12	$56.93	$22.16
Dec-05	54.25	$57.11	$56.40	$22.16
Jan-06	54.25	$58.35	$55.89	$21.00
Feb-06	54.25	$57.99	$55.42	$21.00
Mar-06	54.25	$56.43	$54.97	$21.00
Apr-06	54.25	$48.51	$54.53	$21.00
May-06	54.25	$47.11	$54.14	$21.00
Jun-06	54.25	$47.23	$53.74	$21.00
Jul-06	54.25	$47.35	$53.37	$21.00
Aug-06	54.25	$47.59	$53.04	$21.00
Sep-06	54.25	$47.27	$52.71	$21.00

Based on gas and oil heat rate of 8,000, coal heat rate of 10,500

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Forward Contracts Can Hedge Price, But Not Availability

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Turning the Corner

- Power and Gas Sectors have experienced a recovery fueled by three factors
  - Balance sheet repair driven by cash generation
  - Constructive regulatory environment
  - Healthy energy price environment
- Valuations at high end of historic norms
  - Improving fundamentals
  - Favorable long term interest rate environment
  - Economic recovery and demand for power
  - Possibility of "green coal"?

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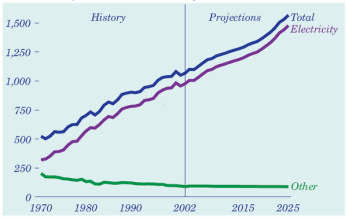
The Future: Clean Coal?

Annual Energy Outlook 2004 with Projections to 2025

Figure 111. Electricity and other coal consumption, 1970-2025 (million short tons)



History: Energy Information Administration (EIA), Annual Energy Review 2002, DOE/EIA-0384(2002) (Washington, DC, October 2003), and EIA, Short-Term Energy Outlook October 2003. Projections: Table A16.

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Summary: Issues Facing CFOs

- Economics: Pricing Pressures
- Mergers & Acquisitions: Valuation Issues
- Financing: Cost and Availability of Capital
- Cash Management: Mismatch Problems
- Risk Management: Hedging Techniques

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