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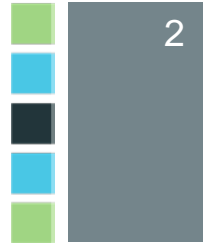
Energy Markets, Pricing, Forecasting, and Budgeting

Presented to
Council for the Great City Schools
Chief Operating Officers

Ft. Lauderdale, Florida
April 24, 2009

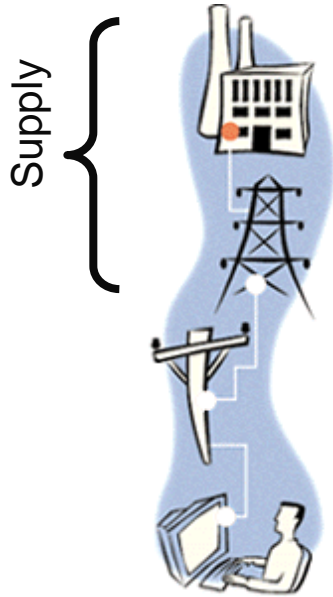
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Outline



- **Energy market structure**
- **Deregulation**
- **Competitive state markets**
- **Energy cost trends**
- **Energy cost outlook**
- **Risk consideration**
- **Strategies**
- **School district opportunities**
- **Energy cost projections and budgeting**
- **Energy procurement and e-procurement**

Energy Market Structure



Electricity	Natural Gas	Deregulated?	Fraction of Total Cost
Generation	Production	Some States	65-85%
Transmission	Transportation	Maybe	~ 10%
Distribution Delivery	Distribution Delivery	Never	15-35%

Regulated markets:

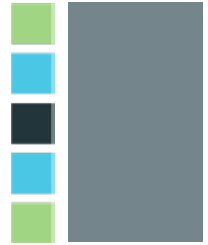
- ▶ *All are “bundled” together and provided by local utility*
- ▶ *Rates are set in tariffs by negotiation with the public utilities commission (PUC)*

Deregulated Markets:

- ▶ *Local utility provides delivery and “Default” supply*
- ▶ *Competitive suppliers provide competitive supply*

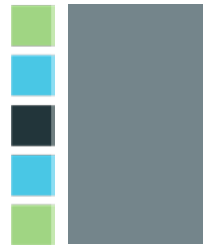
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Utility industry service and cost structure



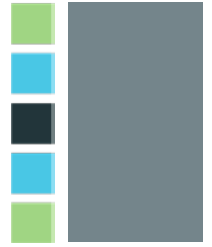
- **Service and cost components**
 - **Generation/Production**
 - **Transmission/Transportation**
 - **Distribution /Delivery**
- **Bundled and unbundled service**
- **Supply versus delivery**
 - **Supply**
 - **Commodity**
 - **Some transportation costs**
 - **Capacity charges**
 - **Losses**
 - **Administrative and scheduling**
 - **Delivery**
- **Fuel/commodity versus non-fuel related costs**

Regulated states (Electric/Gas)



- **Rate-making processes**
 - Annual
 - Interim
- **Types of increases**
 - General or base rate increases
 - Fuel or commodity related
- **Approaches**
 - Rate base +
 - Return on Assets/Investment
 - Rate case submittal/review
- **Trend is to more frequent adjustments more closely tied to market**

Deregulation



- **Separation or restructuring of utilities**
 - Separating delivery and supply
- **Transition periods**
 - Move from regulated to deregulated over several years
- **Default or “provider of last resort” (POLR) service**
- **Unbundling of rates**
- **Dealing with “stranded” assets**
- **Challenges and conflicts**

Rate Structures under regulation



- **Electricity**
 - **Fuel / Commodity costs (65-85%)**
 - **Highly volatile**
 - **Fuel/Energy adjustment factor**
 - **Tariffs**
 - **Monthly, quarterly, annually**
 - **Non-fuel components (15-35%)**
 - **Delivery**
 - **Public purpose**
 - **Credit for Work in Progress**
 - **Tariff**
- **Natural Gas**
 - **Commodity costs (75-85%)**
 - **Highly volatile**
 - **Gas cost recovery rates**
 - **Monthly, quarterly, annually**
 - **Negotiated formula/process**
 - **True-up**
 - **Delivery costs (15-25%)**
 - **Tariff**

Rate Structures under deregulation



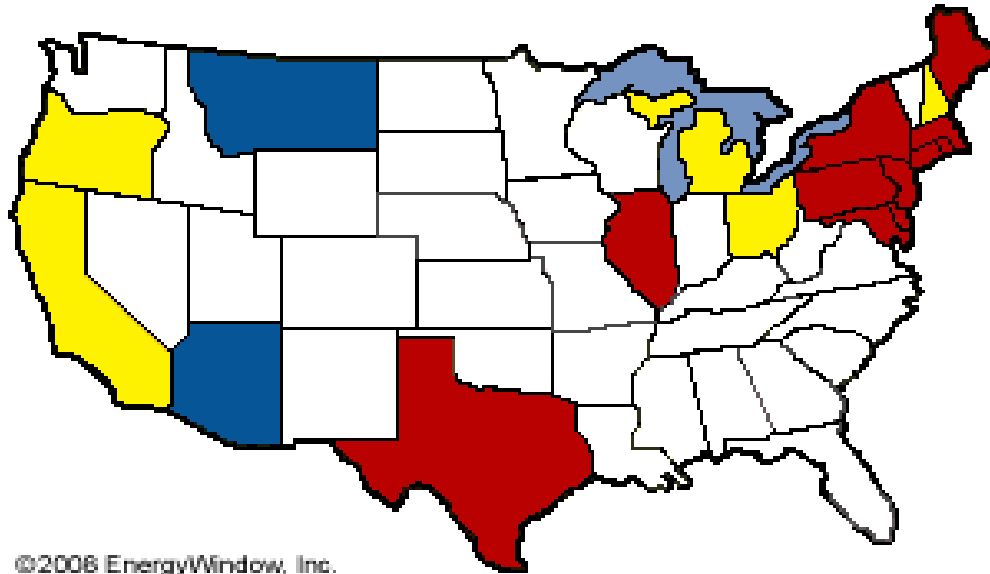
■ Electricity

- Supply (65-85%)
 - Competitive can be fixed
 - Default prices highly volatile
 - Pass-through costs
 - Scheduling
 - Capacity
 - Losses
- Delivery (15-35%)
 - Delivery
 - Public purpose
 - Tariff

■ Natural Gas

- Commodity costs (75-85%)
 - Highly volatile
 - Gas cost recovery rates
 - Pass through of cost/risk to customers
 - Negotiated formula/process
 - True-up
- Delivery costs (15-25%)
 - Tariff

Active Regulated States: Electricity



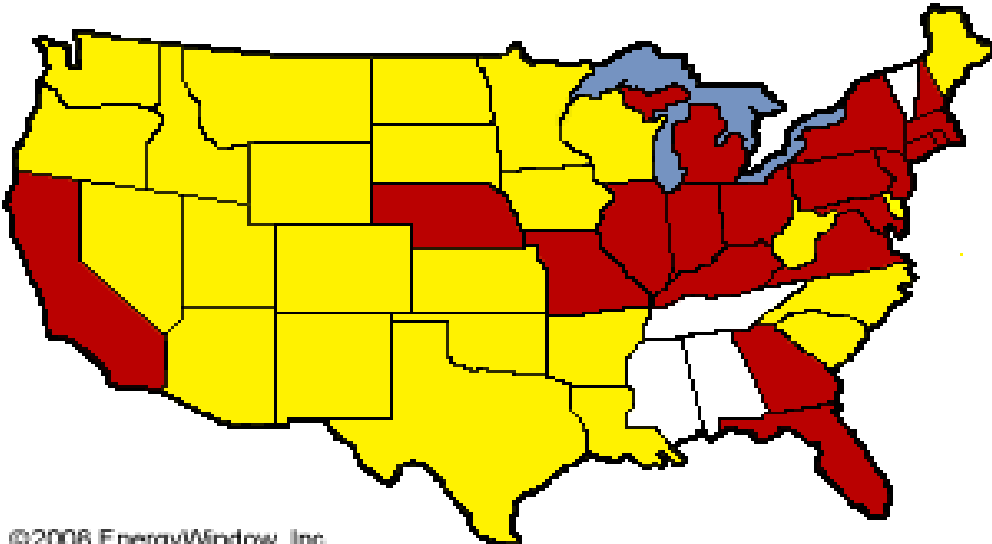
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Select a commodity:

Legend

Active
Potentially Active
Deregulated But Inactive
Regulated

Active Regulated States: Natural Gas



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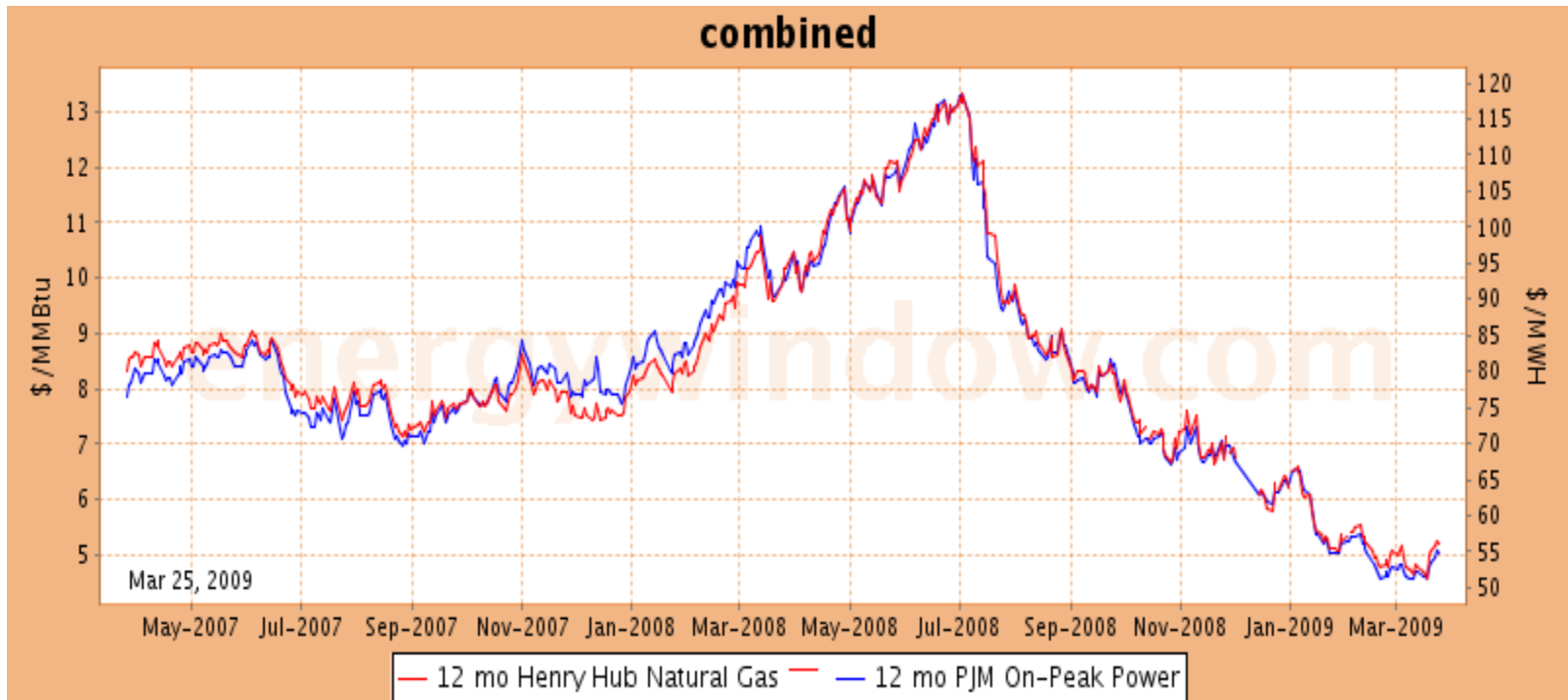
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Legend

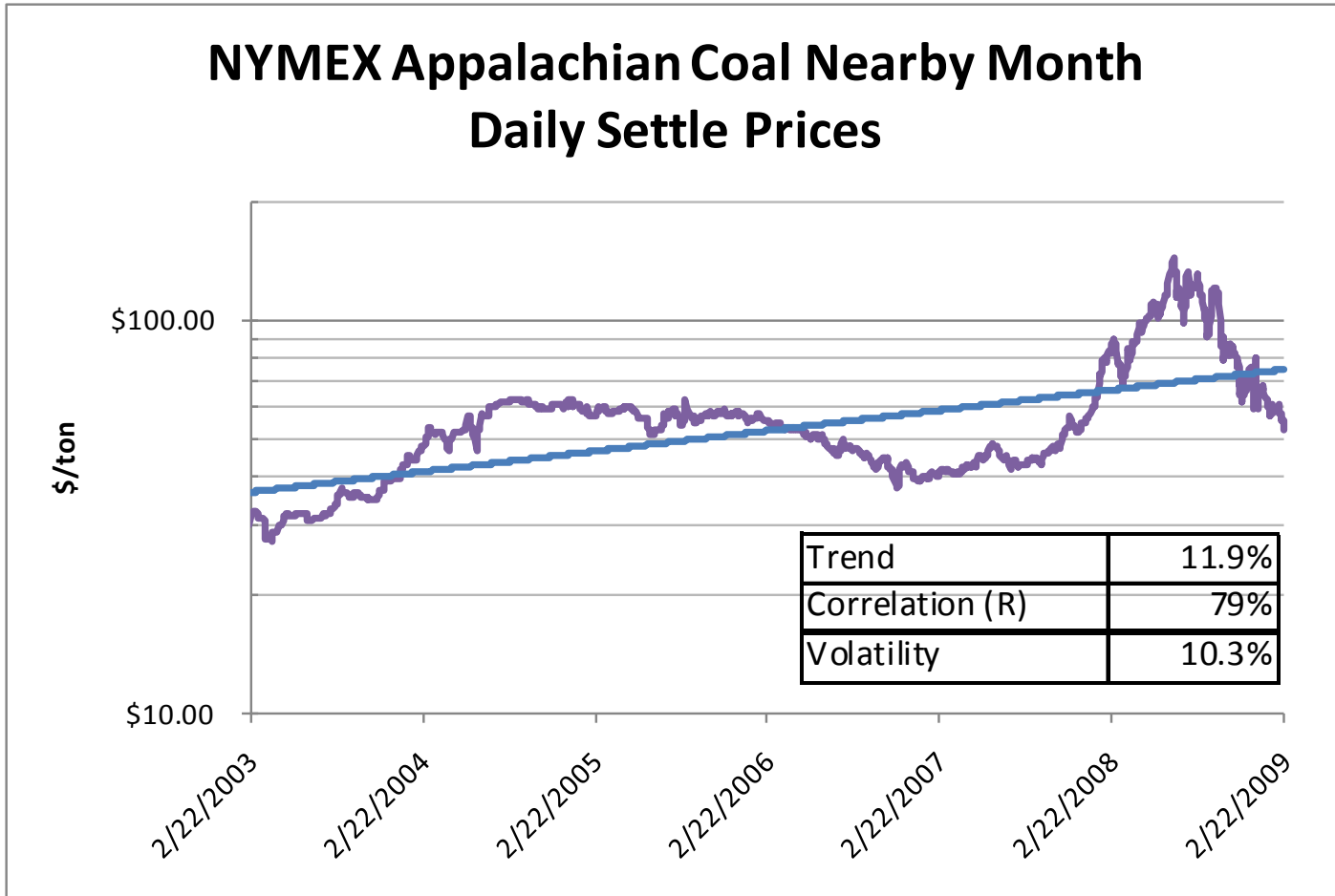
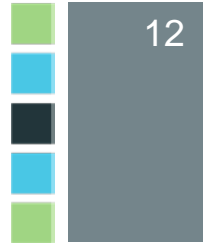
Active
Potentially Active
Deregulated But Inactive
Regulated



Commodity Prices: Electricity/Gas Highly Correlated

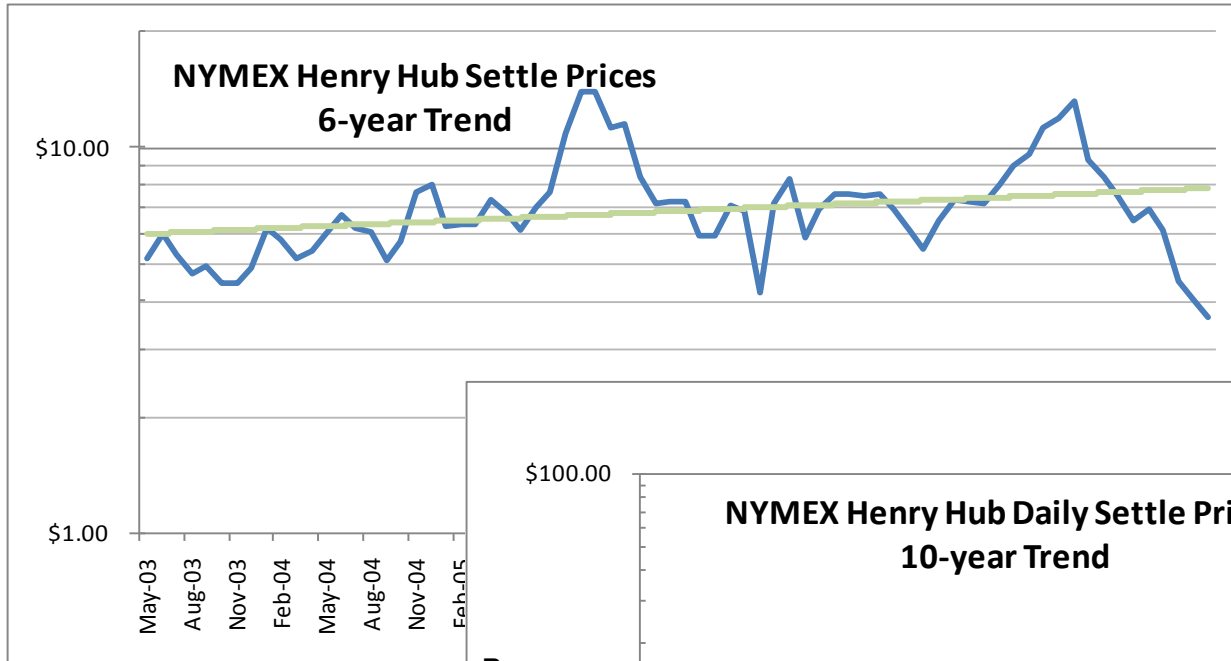


Coal Price Trends

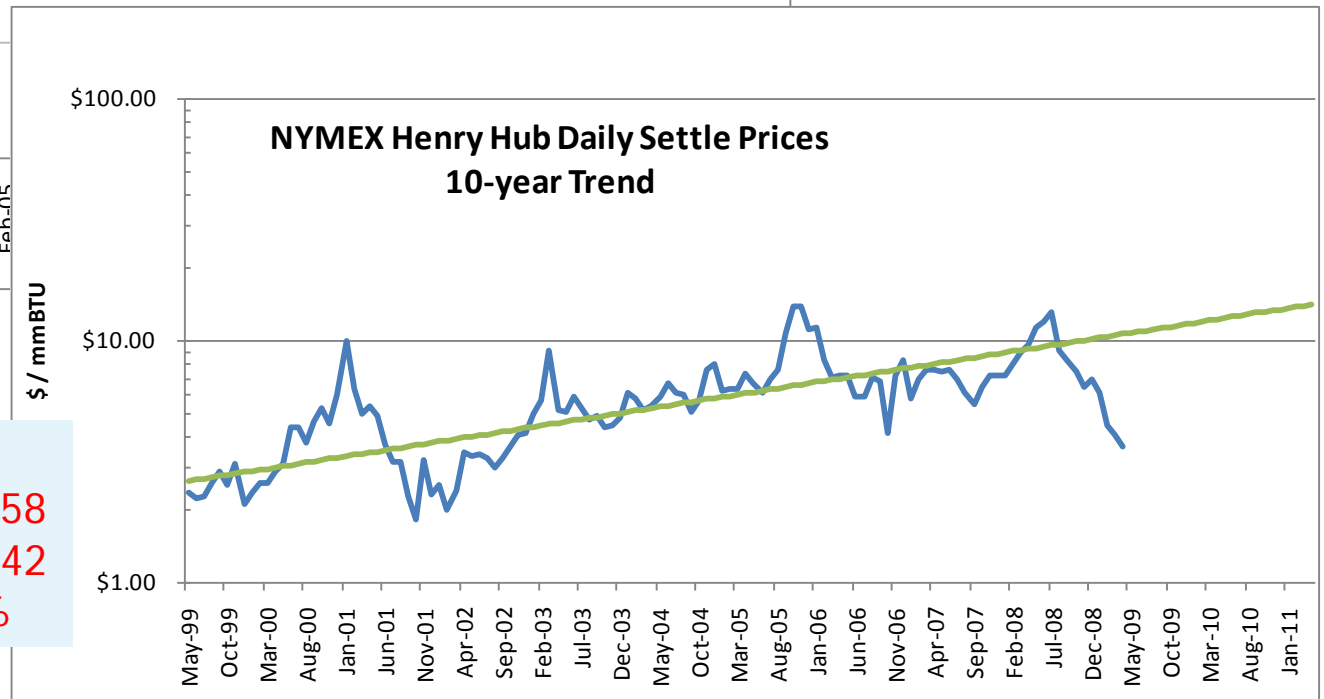


Wholesale Energy Market Trends

As Measured by the NYMEX Henry Hub Natural Gas Monthly Settle Prices



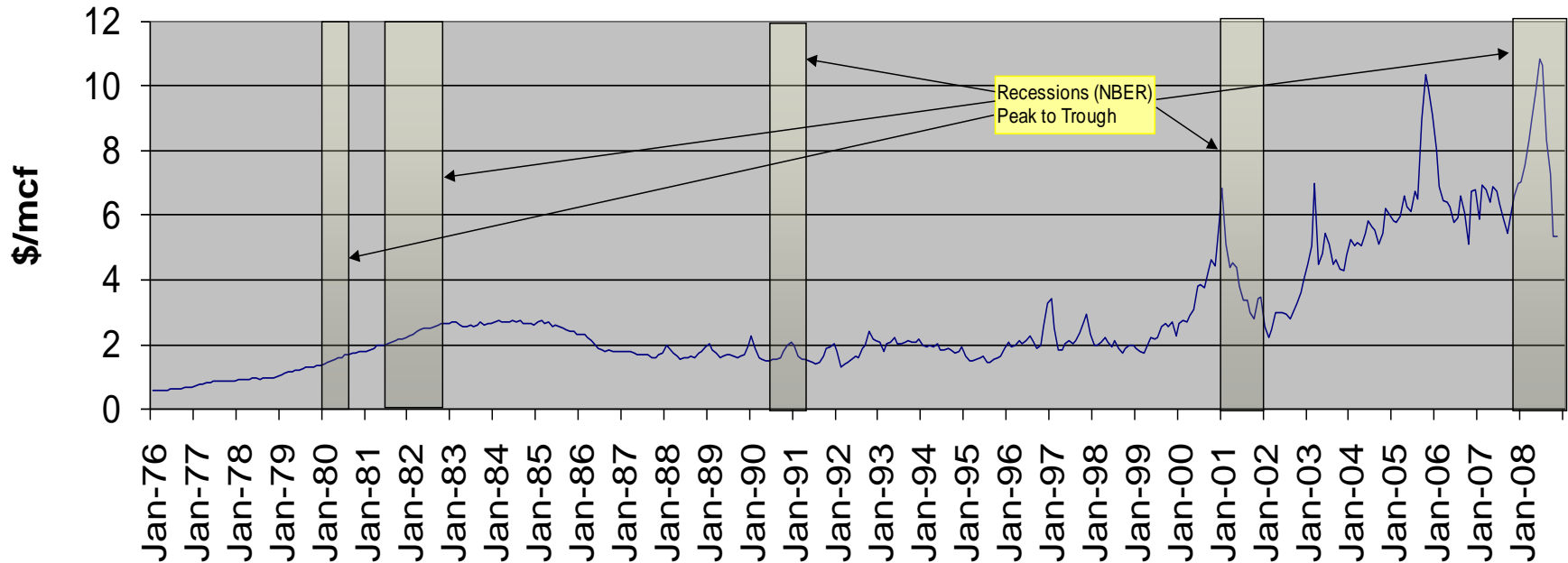
	Trends	Correlations
6 Year	4.6%	48%
	Trends	Correlations
10 Year	11.3%	78%
6 Year	4.6%	48%



2008 average: \$9.03
 Average Jan-Apr/09: \$4.58
 Average Jan-Apr/08: \$8.42
 \$9.03 to \$4.58 => -49%

Recessions and Energy Prices

US Natural Gas Wellhead Prices



- FPC price ceilings (1954-1978) kept prices artificially low
- Natural Gas Policy Act (1978) opened market further but created oversupply
- FERC Orders 436(1985) & 636 (1992) and Natural Gas Wellhead Decontrol Act (1989) finally effectively deregulated the wholesale markets
- So not enough data post-deregulation to see clear correlation
- But effect is clear in the last two recessions

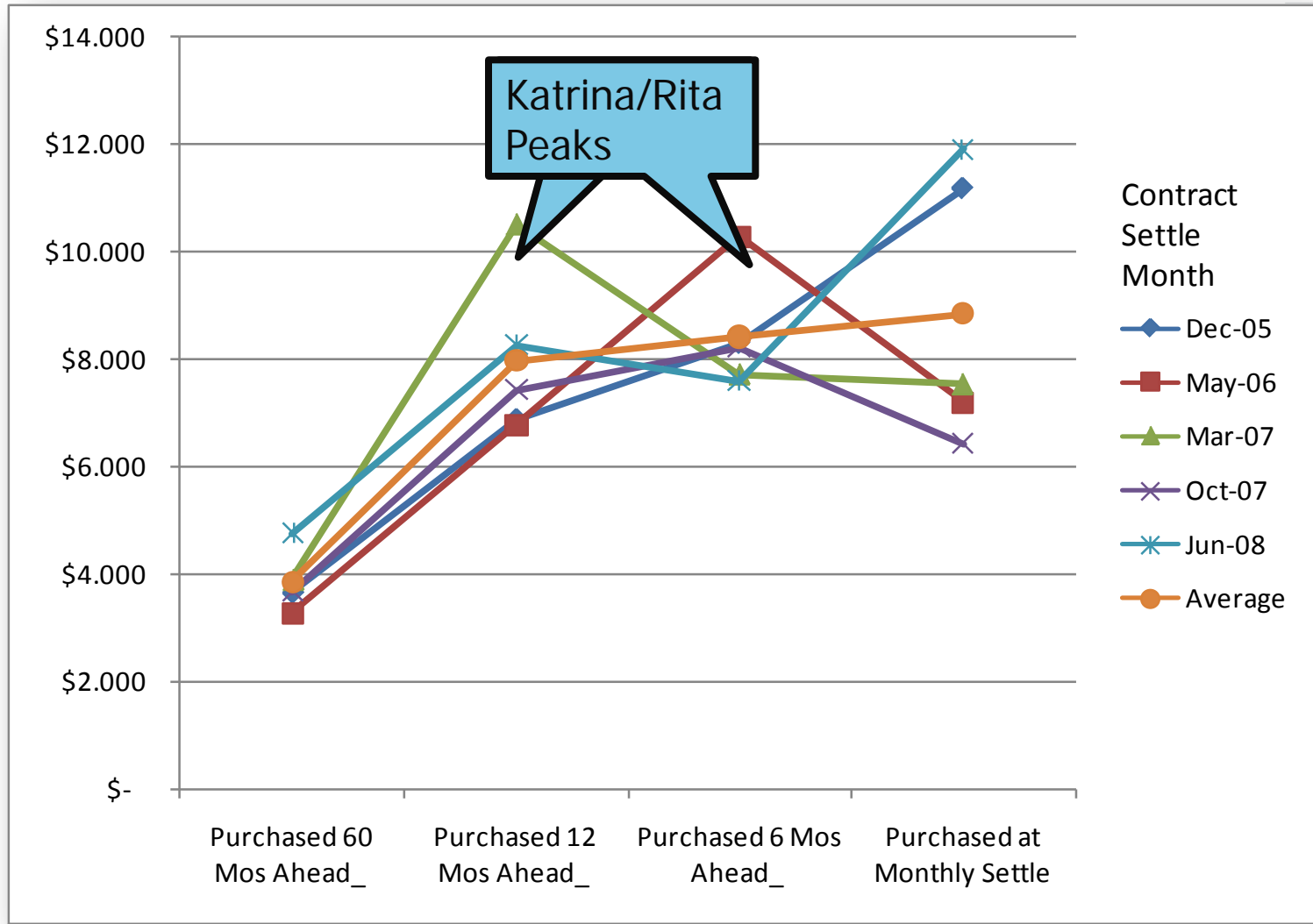
Energy Supply Price Extreme Values

NYMEX Henry Hub 12-month Future Natural Gas Price Strip Average

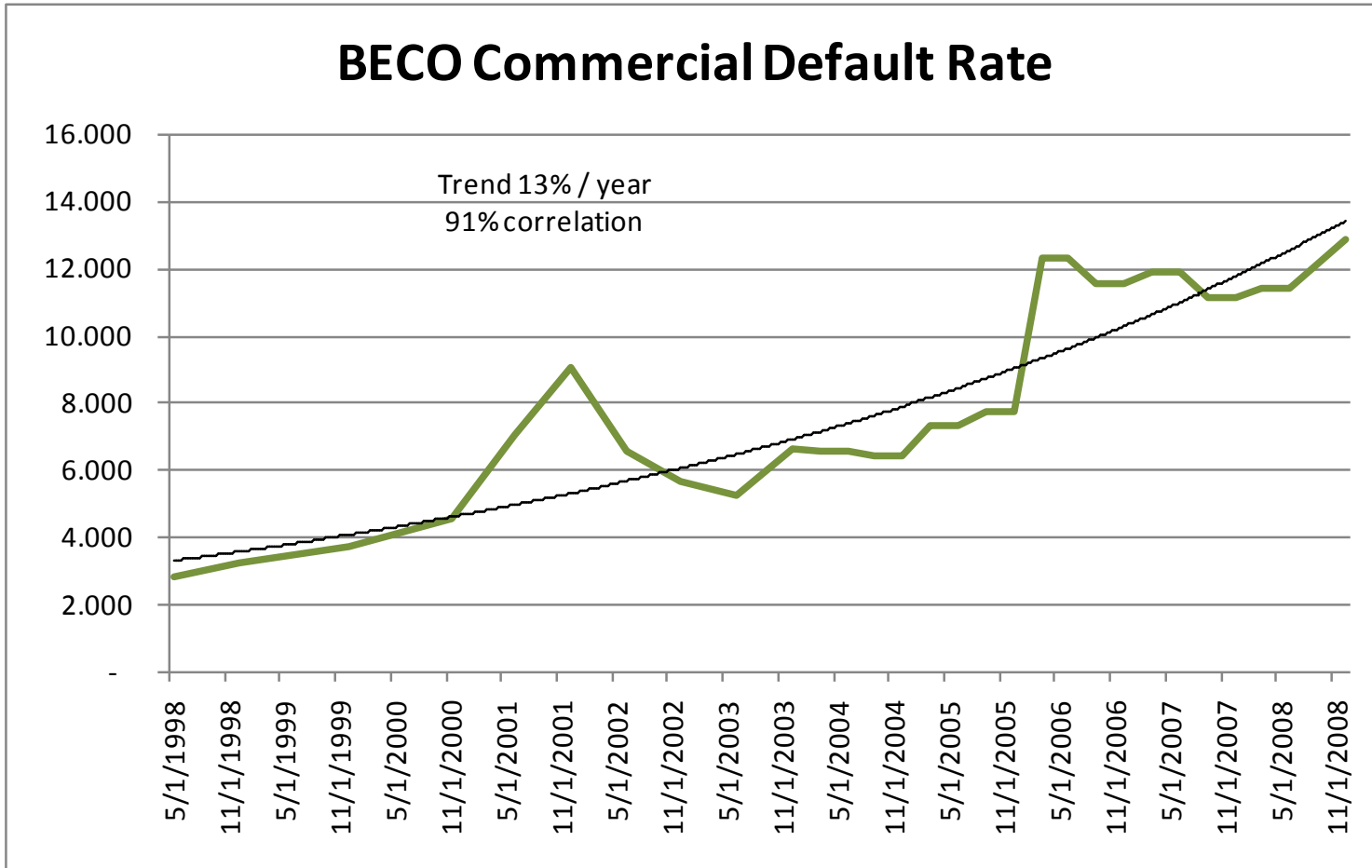
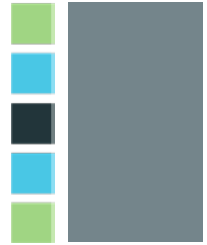


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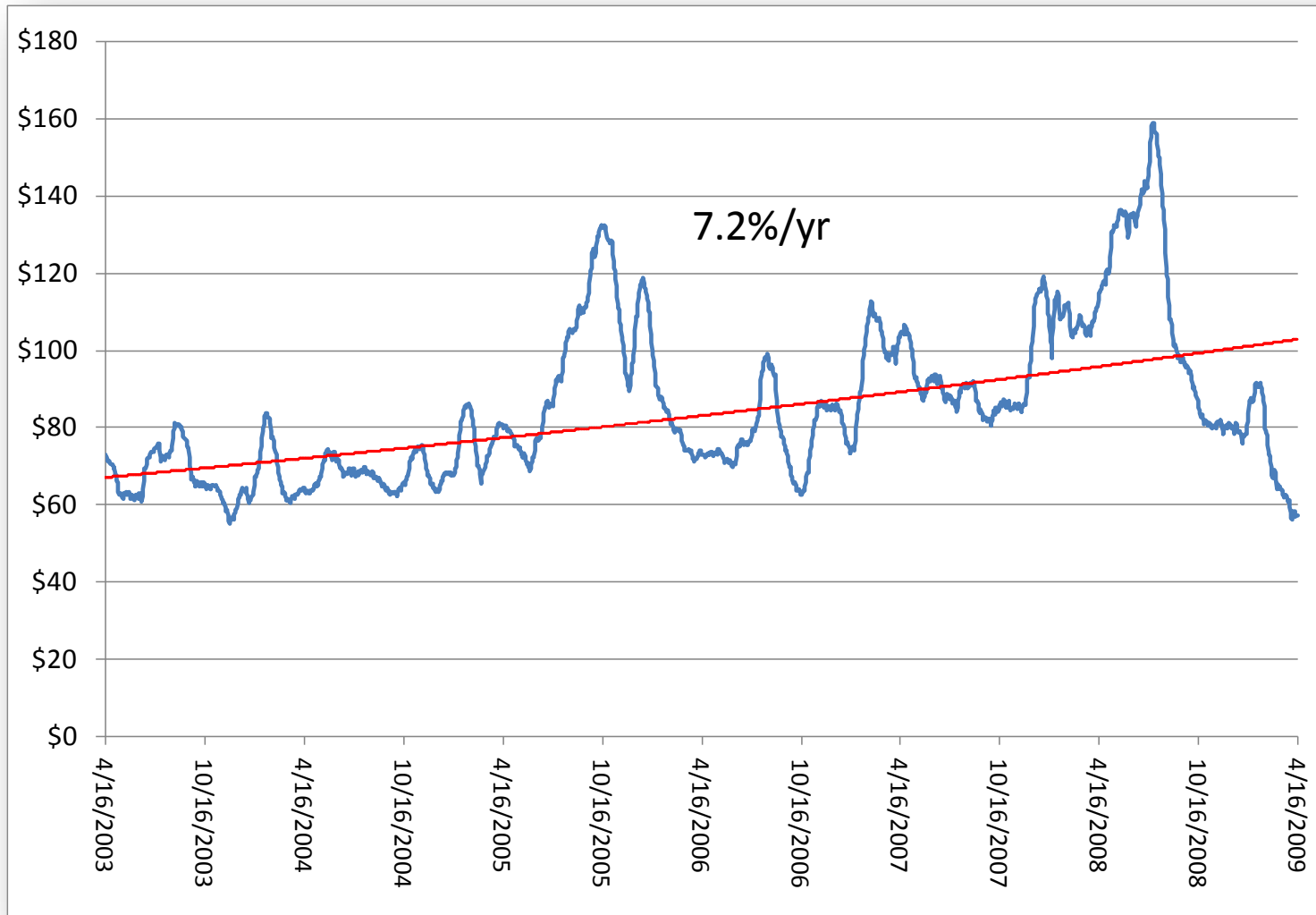
Commodity Contract Price Progression



Retail Electric Supply Trends Example Massachusetts NSTAR/BECO

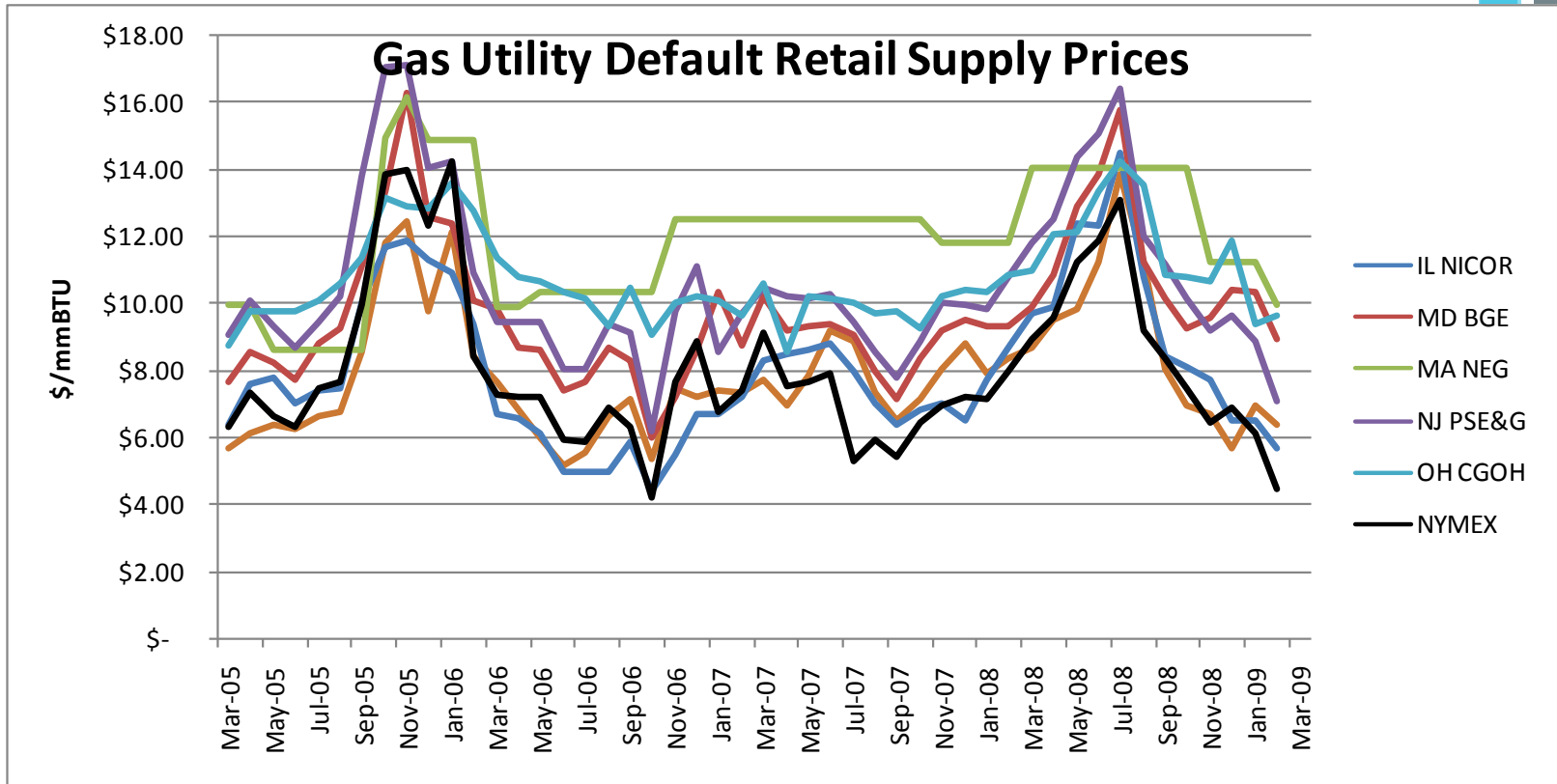


Retail Electric Supply Trends Example New York National Grid SC2 Capital



7/1/08

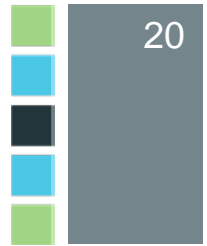
Gas Commodity Default Prices



	PG&E	NICOR	BGE	NEG	PSE&G	CGOH
Trend	3.5%	2.6%	3.1%	6.1%	-0.4%	1.1%
Correlation to NYMEX	92%	92%	93%	78%	98%	90%

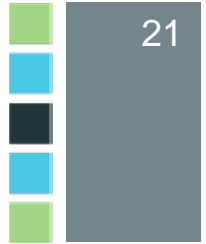


Expert Opinions



- **Most experts expect supply/demand to remain tight**
- **Simmons International:**
 - "...long-term challenges associated with falling domestic production, declining Canadian imports and limited ability to increase LNG imports will likely continue to support high natural gas prices."
 - "LNG import capacity, even if fully utilized, will likely struggle to offset declines in domestic production and Canadian imports."
 - Inverse price/storage relationship on longer always holds
- **Chris McGill, Managing Director Policy Analysis, AGA**
 - "North American supply/demand balance is and will remain tight
 - Gas consumption grows
 - 'New frontier' gas supplies are necessary and take time
 - Gas prices remain relatively high
 - High levels of gas price volatility continue
 - LNG imports become an important player in natural gas pricing"
- **International Energy Agency (OECD) July 2007**
 - "Oil and gas price pressures look set to remain in the coming years. Slower-than-expected GDP growth may provide a breathing space, but it is abundantly clear that if the path of demand does not change on its own, it may well be driven to change by higher prices."

Improving Supply/Demand?



- Gas well productivity
- LNG
 - Currently import < 1.0 TCF of 23 TCF consumed annually
 - Optimistic projections suggest doubling in next 5 years
- Additional major fields and pipelines > 2014
- Nuclear power > 2014
- Acceptable clean coal technology? > 2014
- Major recession could depress demand & prices
- But environmental momentum will increase pressure
- Most alternatives offer floor for, not lower, prices

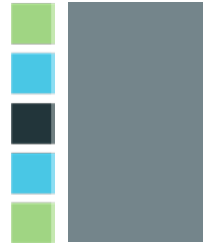
Risk Considerations



- Risks common to indexed, fixed prices, and utility default
(Unanticipated exposure to higher prices)
 - Supplier failure or default on service
 - Financial performance default (buyer or supplier)
 - Utility bankruptcy
- Fixed Contracts
 - Covering unused energy when
 - Market prices below fixed contract rate
- Indexed Contracts and Utility Default
 - Prices escalate significantly – overspend budget
 - Spend uncertainty



Energy Supply Strategy



- Avoid cost increases by using fixed price contracts
- Reduce value at risk and budget unpredictability with fixed prices
- Prices at relative low, probability of prices increasing $>XX\%$
Procure fixed price contracts
- Prices at relative high, probability of increasing $<XX\%$
Procure index price contracts; fix prices when decrease
- Balance and diversify total energy spend portfolio
 - Limit percent floating (regulated supply + indexed supply contracts)
 - Maintain high percent 15% fixed prices
 - Limit risk by distributing fixed price expiration dates
 - Limit supplier risk by means of diversification

School District Opportunities to Fix Supply Costs

<u>Sourcing Opportunities</u>	<u>Electricity</u>	<u>Natural Gas</u>
1. Albuquerque Public Schools	No	Yes
2. Anchorage School District	No	No
3. Atlanta Public Schools	No	Yes
4. Austin Independent School District	No	No
5. Baltimore City Public Schools	Yes	Yes
6. Birmingham City Schools	No	No
7. Boston Public Schools	Yes	Yes
8. Broward County Public Schools	No	Yes
9. Buffalo City School District	Yes	Yes
10. Caddo Parish School District	No	No
11. Charleston County School District	No	Yes
12. Charlotte-Mecklenburg Schools	No	Yes
13. Chicago Public Schools	Yes	Yes
14. Christina School District (Delaware)	Yes	Yes
15. Cincinnati Public Schools	Maybe	Yes
16. Clark County School District	No	Yes
17. Cleveland Metropolitan School District	Maybe	Yes

School District Opportunities to Fix Supply Costs

<u>Sourcing Opportunities</u>	<u>Electricity</u>	<u>Natural Gas</u>
18. Columbus Public Schools	Maybe	Yes
19. Dallas Independent School District	Yes	No
20. Dayton Public Schools	Maybe	Yes
21. Denver Public Schools	No	Yes
22. Des Moines Independent School District	No	Yes
23. Detroit Public Schools	Maybe	Yes
24. District of Columbia Public Schools	Yes	Yes
25. Duval County Public Schools (FL)	No	Yes
26. East Baton Rouge	No	No
27. Fort Worth Independent School District	Yes	Yes
28. Fresno Unified School District	Depends	Yes
29. Guilford County Schools (NC)	No	Maybe
30. Hillsborough County School District (FL)	No	Yes
31. Houston Independent School District	Yes	Maybe
32. Indianapolis Public Schools	No	Yes
33. Jackson Public School District (MS)	No	No
34. Jefferson County Public Schools	No	Yes

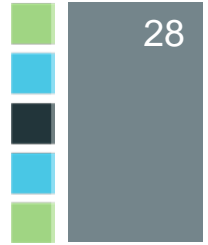
School District Opportunities to Fix Supply Costs

<u>Sourcing Opportunities</u>	<u>Electricity</u>	<u>Natural Gas</u>
35. Kansas City School District	No	Yes
36. Little Rock School District	No	Maybe
37. Long Beach Unified School District	Depends	Yes
38. Los Angeles Unified School District	Depends	Yes
39. Memphis City Public Schools	No	No
40. Metropolitan Nashville Public Schools	No	No
41. Miami-Dade County Public Schools	No	Yes
42. Milwaukee Public Schools	No	Maybe
43. Minneapolis Public Schools	No	Maybe
44. New Orleans Public Schools	No	No
45. New York City Department of Education	Yes	Yes
46. Newark Public Schools	Yes	Yes
47. Norfolk Public Schools	No	Yes
48. Oakland Unified School District	Depends	Yes
49. Oklahoma City Public Schools	No	Yes
50. Omaha Public Schools	No	Maybe
51. Orange County Public Schools (FL)	No	Yes
52. Palm Beach County Public Schools	No	Yes

School District Opportunities to Fix Supply Costs

<u>Sourcing Opportunities</u>	<u>Electricity</u>	<u>Natural Gas</u>
53. Philadelphia Public Schools	Soon	Yes
54. Pittsburgh Public Schools	Yes	Yes
55. Portland Public Schools	Yes	Yes
56. Providence Public Schools	Yes	Yes
57. Richmond Public Schools	No	Maybe
58. Rochester City School District	Yes	Yes
59. Sacramento City Unified School District	No	Maybe
60. Salt Lake City School District	No	Yes
61. San Diego Unified School District	Depends	Yes
62. San Francisco Unified School District	Depends	Yes
63. Seattle Public Schools	No	NO
64. St. Louis Public Schools	No	Yes
65. St. Paul Public Schools	No	Maybe
66. Toledo Public Schools	Maybe	Yes
67. Wichita Public Schools	No	Depends

Energy cost projection & budgeting



Electricity

- Supply/commodity prices
 - 65-85% of total
 - Long-term trend 12-15% per year
 - Change monthly, quarterly, annually
 - Volatile; allow for uncertainty
 - Fixed prices where contracted
 - Allow for fuel adjustment in regulated utilities (% may vary)
- Delivery/non-commodity
 - 15-35% of total
 - 2-6% per year
 - Determined by less frequent rate cases

Natural Gas

- Commodity/default supply prices
 - 75-85% of total costs
 - Change monthly, quarterly, annually
 - Volatile; allow for uncertainty
 - Fix where contracted
- Delivery
 - 15-25% of total
 - 1-3% per year
 - Determined by infrequent rate cases

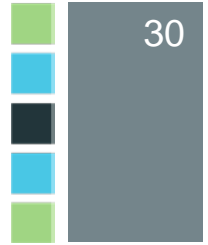
$$\text{Total rate} = \text{Commodity fraction} \times \text{commodity rate} + \text{delivery fraction} \times \text{delivery rate}$$

Energy Procurement Considerations



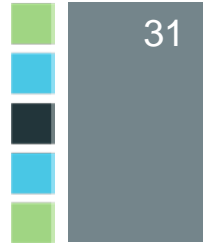
- Price product options
- Important Contract terms
 - Coverage
 - Early termination
 - Financial performance and assurance
- Standard Contracts (NAESB)
- Supplier Qualifications
- Cost components
 - Fixed
 - Pass-through
- Default prices
- Dealing with volatility
- Having a preapproved strategy, plan, and contract parameter ranges – **Strategic Sourcing**

Energy E-Procurement



- Auction obtains lowest price
- Reduces effort and cost of procurement by up to 100
- Reduces calendar time by as much as 2-4
- Provides apples-to-apples comparison
- Provides market expertise and current knowledge
- Achieves comprehensive supply participation
- Includes independent evaluation and advice

Summary



- Energy cost have been rising at 10% or more for a decade and are extremely volatile
- Not much suggests supply/demand are going to get better over the long term
- The best way to avoid cost increases and budget unpredictability and overruns is through fixed price contracts, if you can
- Now is a good time to buy
- Energy e-procurement can save a lot of time and money, enable quick action, and support the best informed decision



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