

Gas Industry Standards Board

San Antonio, Texas

Financial Issues Of Electronic Commerce In Natural Gas

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Financial Issues Of Electronic Commerce In Natural Gas

- ⊗ I. Introduction.
- ⊗ II. Commodity Markets.
- ⊗ III. Process Modification.
- ⊗ IV. Conclusions.

Summary

Electronic Commerce Facilitates...

- ⊙ Real Time Management.
- ⊙ Transaction Cost Reduction.
- ⊙ Commoditization Of Different Products.
- ⊙ Position Management For Retail Choice.

I. Introduction.

Context For Portfolio Management Tools Is Enterprise-Wide.

Return - Credit Rating, EPS, Operational Efficiency, Share Price
Risk - Credit Market, Operational



I. Introduction To Risk Management. Is Portfolio Management Required Or Optional?

- For Businesses in Contestable Markets, the Core Business Is Portfolio Management.
- New Counter-Parties Continue To Arise.
- Need To Price Credit Risk Into Products And Services.
- Portfolio Management Is Needed For Buyers And Sellers.
- Retail Customers Will Have Choices In Markets.
 - This Will Expand Market Liquidity.
 - This Will Increase Demand For Financial Products.



I. Introduction To Risk Management. Barriers To Wider Use Of Derivatives.

- Overall:
 - Lack Of Understanding About Marketing and Risk Management.
 - Lack Of Price Transparency/Liquidity In Some Regions.
- Specific Problems:
 - Multiple Market Relationships Suffer From Lack Of Liquidity.
 - Embedded Options Widespread: Sometimes Mis-Priced.



I. Introduction To Risk Management.

Barriers To The Use Of Portfolio Management.

- Overall:
 - Appropriate Objectives Established Through Risk Assessment Needed.
 - Definition Of Needs Required.
 - Split Structure Requires Careful Development.
 - Appropriate Performance And Risk Tolerance Measures Are Needed.
 - Appropriate Compensation Mechanisms Are Needed.
 - Appropriate Controls Are Needed.
 - Appropriate Documentation And Position Tracking Systems Are Needed.
- One Preliminary Conclusion:
 - It Seems Unlikely That There Is One Strategy For All.



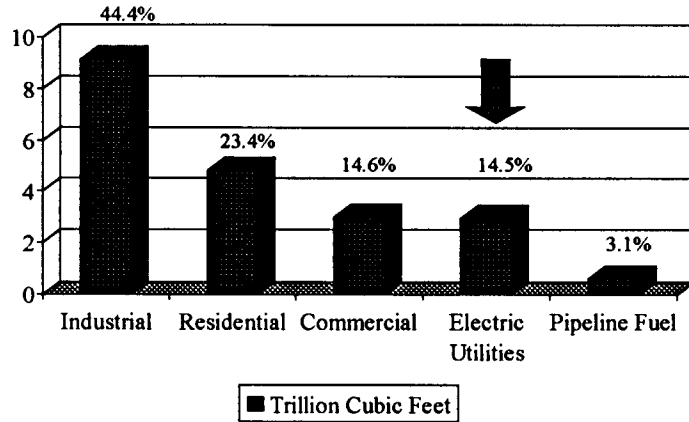
II. Commodity Markets.

Observations.

- Spot Markets Driven By Real-Time Events.
 - Generation Status.
 - Power Exchange Prices.
 - Short Term Weather Events / Forecasts.
 - River Flows.
- Much Of What Will Influence The Future Spot Market Is Knowable Or Can Be Estimated.
 - Medium Term Weather Forecasts.
 - Maintenance Schedules.
 - Fuel Costs.
 - Conversion Efficiency.
 - Cost Of Capital

II. Commodity Markets.

1995 U.S. Natural Gas Consumption By Sector.

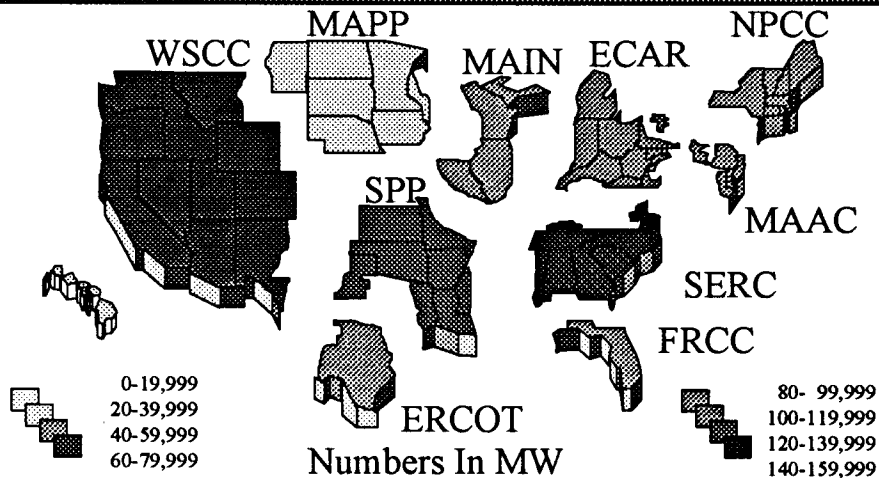


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II. Commodity Markets.

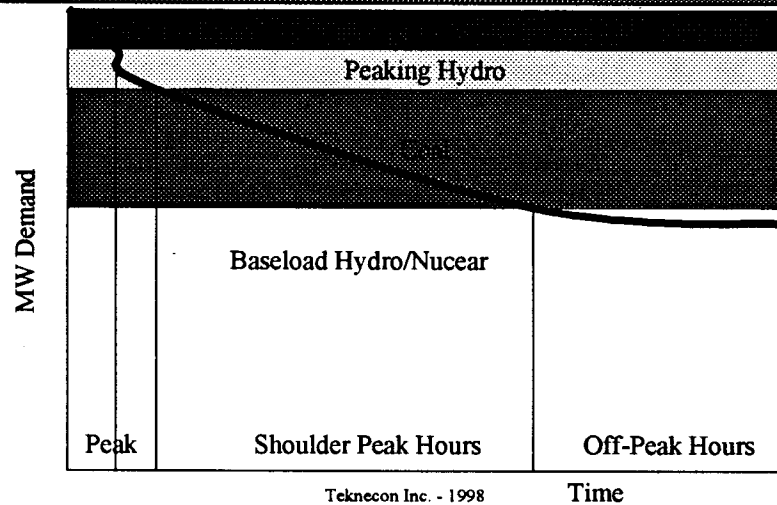
Approximate Demand Peak By NERC Region.



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II. Commodity Markets. Typical Electricity Dispatch Order.



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Time

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II. Commodity Markets. Characteristics Of Electricity Markets.

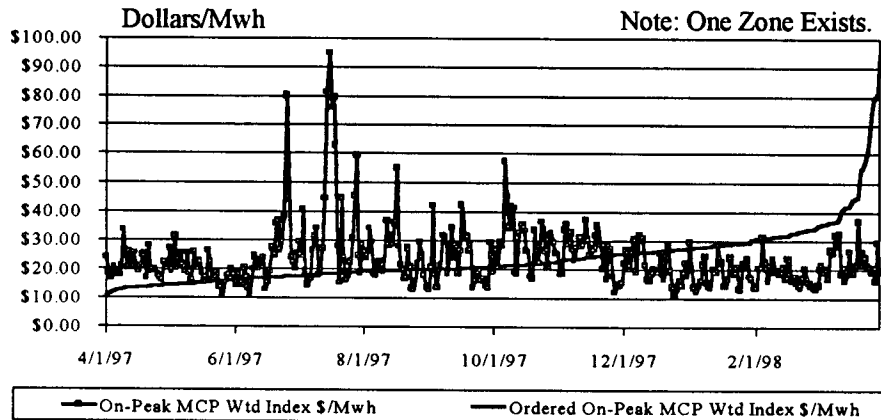
- Large Time Spread Volatility Differences.
 - Prompt Volatility Is High In All Markets.
 - Term Volatility Is Highly Differentiated.
 - Front To Back Volatility Has Major Implications For Appropriate Pricing.
 - Convenience Yield Is Very High.
 - Cost Of Carry Relationships Are Still Developing.
- Large Liquidity (Year-Over-Year) Issues.
 - Varies By Region.
 - Do Counter-Parties Have Sufficient Risk Warehouses?
- Fragility Of Supply And Unit Differences Create Discontinuous Jumps.
 - Planned And Forced Outages.
 - Fuel Differences.
- A Collection Of Regions Or A National Market?

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II. Commodity Markets.

Spot Market PJM MCP: Daily Prices, On-Peak, Pool-Wide.

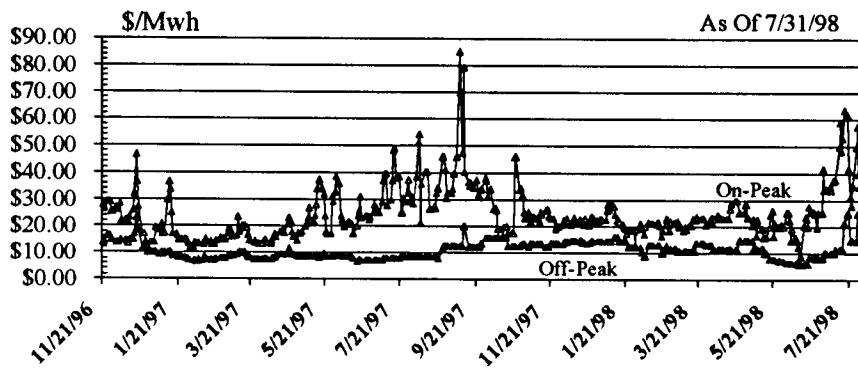


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II. Commodity Markets.

Medium Term: Spot Four Corners - On-Peak Versus Off-Peak.



Source: Bloomberg

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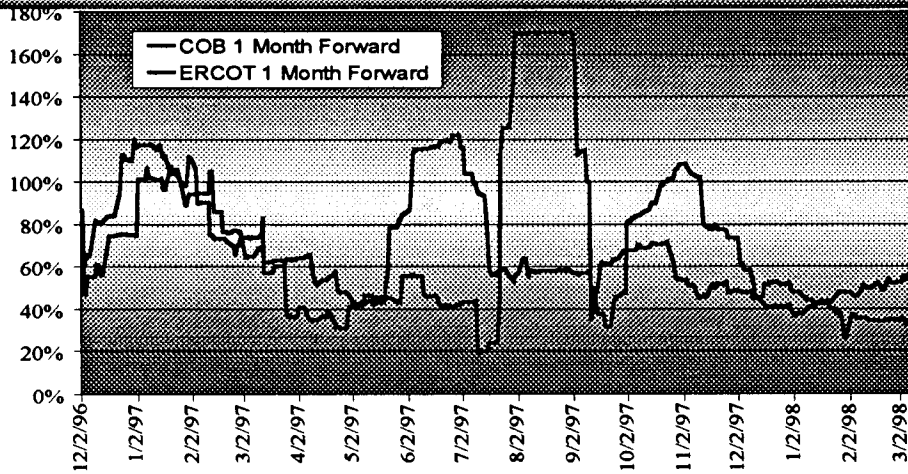
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II. Commodity Markets. Volatility Comparison - Day Ahead Versus One Year.



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II. Commodity Markets. One Month Forward Volatility: COB And ERCOT



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Source: Bloomberg

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III. Process Modification. What Changes Are Occurring?

⊙ **Major Categories Of Change.**

- Order 587 - Shift From EBB's to Internet-Based EDI.
- Pending NOPR On Transportation Offerings and Pricing.
- Influence Of Electricity Restructuring.
- Influence Of Energy Retail Access Experiences.
- Possible Convergence Between Multiple Markets.



III. Process Modification. What Changes Are Occurring? Order 587.

⊙ **Shift From EBB's to Internet-Based EDI.**

- Customer Cost Shifting Issues. Ability To Pay Impacted By Their Own Activities. Electricity Industry Good Example.
- Large Shipper Versus Small Marketing Company Perspectives Are Different. Small Companies Comfortable With Status Quo.
- Title Transfer Tracking Important Since Chains Have Multiple Links.



III. Process Modification.

What Changes Are Occurring? Pending NOPR.

- ⊙ Pending NOPR.
 - Major overhaul of natural gas pipeline rules covering what pipeline companies can offer and charge their gas shipping customers.
 - Suggests lifting price caps in the short-term transportation market and allowing pipelines and shippers to negotiate terms and conditions of service.
 - FERC has purposely left many of the details of a final rulemaking out of the proposal to allow industry to make its own amplifications, including implementation of an auction process for allocating capacity.
 - Internet use may facilitate electronic bidding.
 - FERC's concern appears to be that penalties and operational flow orders (OFOs) may be impacting shipper flexibility and the efficiency of the short-term capacity market.



III. Process Modification.

What Changes Are Occurring? Pending NOPR.

- ⊙ Potentially, The Need For Penalties Can Be Reduced By:
 - The trading of imbalances.
 - The provision of timely information about system imbalances so shippers can anticipate adverse operational conditions and avoid possible penalties.
 - "No harm, no foul" rules under which shippers will not be penalized for actions that help maintain the operational integrity of the pipeline system.
- ⊙ Concept is that penalties that are "not set at specific dollar levels, but instead reflect the varying gas commodity prices that are available to shippers; for example, a regional index plus an adder".



III. Process Modification.

What Changes Are Occurring? Trading Process.

- ⊙ Today, more opportunities to do business, but also more work.
- ⊙ Four-cycle nomination schedule; addition of two more cycles to the two-day nomination schedule.
- ⊙ Complexity means less per-transaction flexibility for individual shippers, but greater opportunity to transact.
- ⊙ Standardized nomination and scheduling time lines:
 - Next-day nominations submitted by 11:30 a.m. Second cycle due at 6 p.m.
 - Pipelines must confirm by 4:30 p.m.
 - Same-day nominations are accepted at 10 a.m. Second cycle due at 5 p.m.
 - Pipeline constraints mean that third cycle (same day) may be unavailable.



III. Process Modification.

What Changes Are Occurring? Trading Process.

- ⊙ Routines Have Changed Also.
 - Old: 8 a.m. to 5 p.m., standard timeframe.
 - New: 7 a.m. to 3 p.m., compressed timeframe.
 - Typically, scheduler and trader on call during evenings and weekends.
 - Weekend trading now common.
 - Possible that trading/scheduling lines will blur.
- ⊙ Intra-day transactions are used to “true-up” business and correct mismatches.
- ⊙ Power generators are particularly difficult market segment.



III. Process Modification.

What Changes Are Occurring? Electricity Restructuring.

- ⊙ **Requires Real-Time Focus.**
 - Hourly Transactions.
 - New Markets.
 - Monetizing Options.
- ⊙ **New Market Entrants With New Expectations.**



III. Process Modification.

What Changes Are Occurring? Electricity Restructuring.

- ⊙ **Pricing Individual Services:**
 - Value Of Daily Changes In Volumes.
 - Value Of A Monthly Strip Of Daily Changes In Volumes.
 - Value Of An Annual Strip Of Daily Changes In Volumes.
 - Value Of On-Peak Sales Versus RTC Purchases (Or Vice-Versa).
- ⊙ **Asset Valuation.**
- ⊙ **Facilitate Investment Decisions.**
- ⊙ **Mark-To-Market, Stop Loss, And VaR For All Timeframes.**
- ⊙ **Real Time Customer Pricing.**

III. Process Modification.

What Changes Are Occurring? Electricity Restructuring.

■ Gas Examples:

- Streamline
- Quicktrade

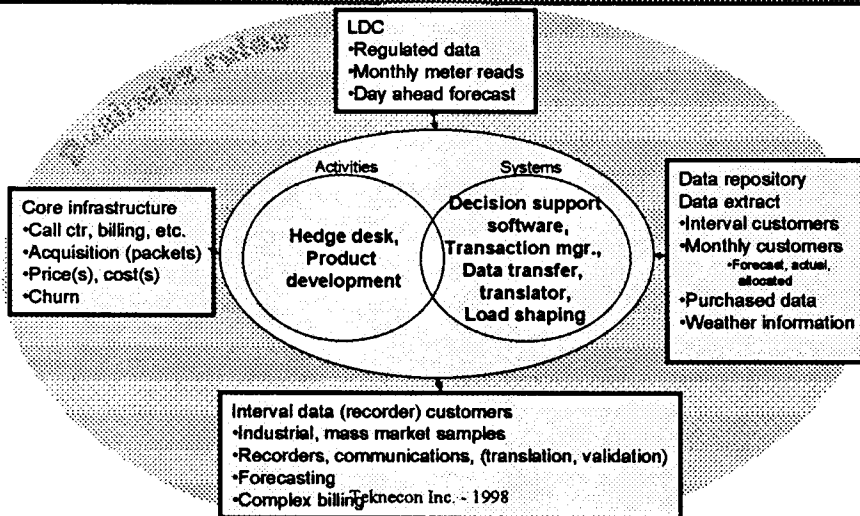
■ Electricity Examples:

- Alberta PX
- APX.
- Cal PX.
- PJM.
- Bilateral.

■ Trading Hubs Also Important.

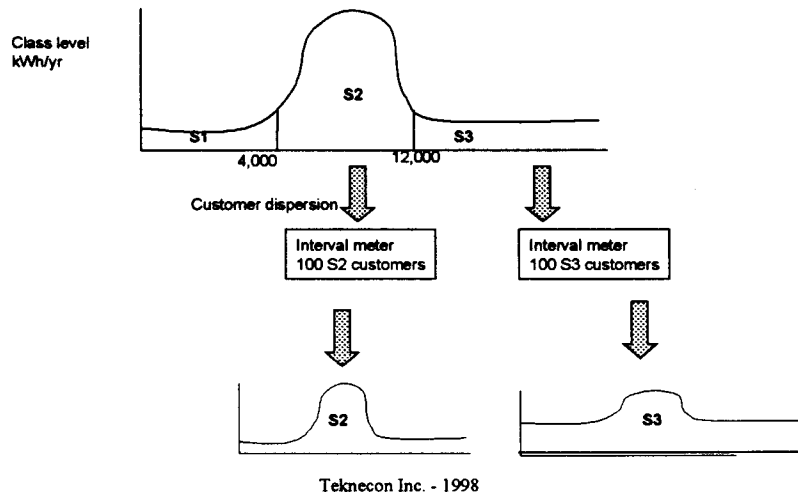
III. Process Modification.

What Changes Are Occurring? Retail Access.



III. Process Modification.

What Changes Are Occurring? Retail Access.



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III. Process Modification.

What Changes Are Occurring? Retail Access.

- © Major Development Areas:
 - Call Center Interface.
 - Transaction Manager.
 - Customer Churn Issues.
 - Decision Support Systems.
 - Historical Data.
 - Weather Forecasts And Data.
 - Interval Data Recorders.

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III. Process Modification.

What Changes Are Occurring? Convergence.

Electricity Revenues

Spark Spread

Fuel Costs + O&M+ Redispatch+Transmission

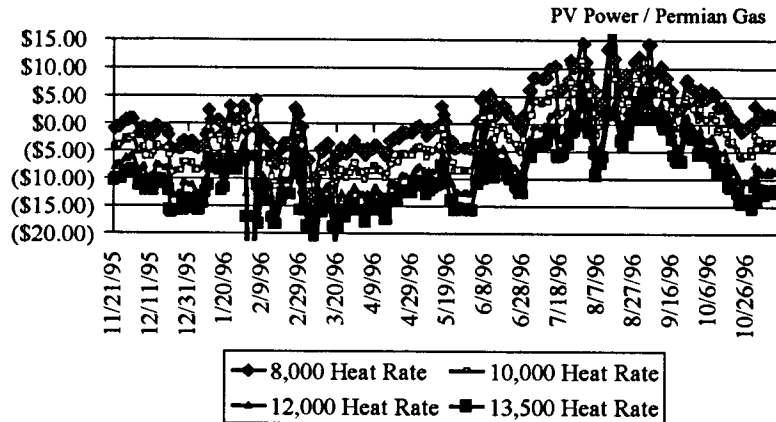
Consider Opportunity Benefits/Costs Over Multiple Timeframes.

III. Process Modification.

What Changes Are Occurring? Convergence.

<u>Heat Rate Eff</u>	<u>Mult To Gas</u>	<u>Non-Firm Peak Power</u>	<u>San Juan Nat Gas \$/MWH</u>	<u>Gas To Power \$/MWH</u>	<u>Spark Spread \$/MWH</u>
8,000	5:3	10.63	10.08	8.64	\$1.98
10,000	4:3	10.63	10.08	10.08	\$0.55
12,000	6:5	10.63	10.08	12.96	(\$2.34)
13,500	1:1	10.63	10.08	14.58	(\$3.96)

III. Process Modification. What Changes Are Occurring? Convergence.



Source: Bloomberg

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IV. Conclusions.

- ⊙ Real Time Management.
- ⊙ Transaction Cost Reduction.
- ⊙ Commoditization Of Different Products.
- ⊙ Position Management For Retail Choice.

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