Integrated Electrics
Two Steps Forward…One Step Back

The Institute for Regulatory Policy Studies’
Energy Markets at the Crossroads

December 12, 2002

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CREDIT SUISSE FIRST BOSTON
The Old Model Served Customers Well Since the Great Depression

Raw Materials
(Coal, Oil, Gas, Uranium, Water)

BTU

MANUFACTURING

DELIVERY

MWH

Industry Structure
• Vertically integrated
• Monopoly supplier
• State regulation
• Obligation to serve / regulatory compact

Franchise Customers
But Rising Prices Inspired Federal Regulators to Act

**Average U.S. Retail Electric Rates**

- **NEPA (1992)**
- **SMD (2002)**
- **Order 888 (1996)**
- **PURPA (1978)**
- **Oil Crisis (1973)**

Source: EIA and CSFB estimates
And It All Seemed To Be Progressing Smoothly

• 23 states enacted electric restructuring legislation between 1996 and 2000
• California developed the first U.S. wholesale power exchange in 1998

Source: EIA and CSFB estimates
Until the California Crisis Exposed...

Prices for Electricity and Natural Gas
(1/1/99 – 06/30/01)

Source: Bloomberg and CSFB estimates.
The Magnitude of Boom and Bust

US Reserve Margin
(1996 – 2007E)

Source: RDI, EIA, NERC, CSFB estimates
The Dangers of Too Much Leverage

- Business and financial risks must be properly aligned
  - < 50% debt for manufacturing, lower for risk management
- Lack of tenor matching exposed liquidity concerns
- Financial engineering can be life threatening – ratings triggers

Debt / Capitalization Ratio – Integrated Electrics
(1992-2001)

Debt-to-Capital Ratios for Other Commodity Manufacturers

- E&P: 26%
- Steel: 45%
- Paper: 51%
- Chemicals: 53%

Source: Factset, CSFB estimates.
And The Fragility of Investor Confidence

S&P Utility Index

5/1/2001 to Present

July 2001
Barrons Article on Power Glut

March 2002
Dynegy announces SEC investigation for wash trades

December 2001
Enron Bankruptcy

May 2002
Enron memo surfaces in FERC investigation

September 2002
Need for additional equity by Dominion and TECO touch off a wave of liquidity concerns

October 2002
TXU reveals liquidity crisis owing to UK market weakness

June 2002
WorldCom
Causing a Re-Examination of The Entire Approach

- Two steps forward, one step back
- 9 of 23 states are re-evaluating retail deregulation (California suspended)
- All eyes on Texas deregulation experiment

**Status of Retail Deregulation By State**

**Legend**

- Restructuring Active
- Restructuring Delayed
- Restructuring Suspended
- Restructuring Not Active

Source: EIA and CSFB estimates
...But If Structured Properly, Deregulation Can Benefit Ratepayers

- UK prices have declined substantially in response to improved market design

**UK Power Pool Prices**
12/1988 to 12/2002

**Australian Power Prices**
1/1999 to 12/2002
We Envision A Disaggregated World

**Manufacturing**
- Commodity conversion
- Location, location, location
- New technology, improved operating efficiency
- Lessons from: E&P, steel, refiners, paper, chemicals

**Risk Management**
- Energy intermediaries (retail and wholesale)
- Intellectual capital / information nexis
- Strong balance sheet
- Lessons from financial services/brokerages

**Delivery**
- Regulated infrastructure
- Regulators drive returns on capital
- Incentive regulation can encourage efficiency
- Lessons from UK regional electrics/transmission companies
With Differentiated Opportunities to Create Value

- Substantial value to be captured through evolution to competitive market
  - Improve resource allocation decisions and operating efficiency
- Average US Electric Rate ~ $72 / MWh
  - ~ 70% Generation ~ $50 / MWh
  - Cost of New CCGT ~ $45 / MWh
  \[ $5 / \text{MWh} \times 3.9 \text{ BN MWh/Yr} = $20 \text{ BN / YR} \]

Manufacturing
- Improved utilization

Risk Management
- Smooth volatility

Delivery
- Infrastructure Investment

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Nuclear Capacity Factor (1991 –2001)

24 Load & Price – CAISO (7/27/00)

Transmission Investment vs Demand

Source: SNL Securities Database and CSFB estimates.
Source: California ISO and CSFB estimates.
Source: Beacon Energy and CSFB estimates.
And The Markets Are Reaching a Similar Conclusion

- P/E ratios diverged as competitors pursued strategies focused on different aspects of the energy value chain
- Commodity cycle conditions have increased P/E volatility for unregulated players

One Year Forward P/E Ratios for Electric/Gas Companies
(1/1/96 to Present)

Source: Factset and CSFB estimates.
As Always, the Devil Will Be in The Details

- Near term (managed monopolies)
  - Generation price caps
  - Limit market concentration
  - Mandated reserve margins
  - Standardized market design

- Long term (free market for generation)
  - Sufficient investment in transmission grid
  - Floating retail generation rates / end of stranded cost recoveries
  - Incentive rate structures for delivery
  - Emergence of new technology