

CALIFORNIA ENERGY CRISIS 2000-2001: ANALYSIS AND LESSONS LEARNED

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What happened 2000-2001?

- Wholesale power prices soared across the West (10-15X higher than '98-'99)
- Bad market structure/design
- Blackouts, business disruptions in CA and West
- Gas and electricity market manipulation
- Bankruptcy of nation's largest utility: PG&E
- FERC and CA slow to impose effective remedies
- A fiasco, lasting adverse impact on credibility of competitive mkts, but valuable lessons learned

CPUC plan + AB1890

- Fossil generation divestiture by IOUs.
- Retail rates cut 10% and frozen until stranded costs recovered
- Created separate ISO and PX
- PX: day-ahead and hour-ahead markets
- ISO: Balanced supply/demand schedules, 3 congestion zones, out of market bilateral purchases to avoid shortages
- IOUs required to use spot market for all supply sales and purchases

FERC and AB1890

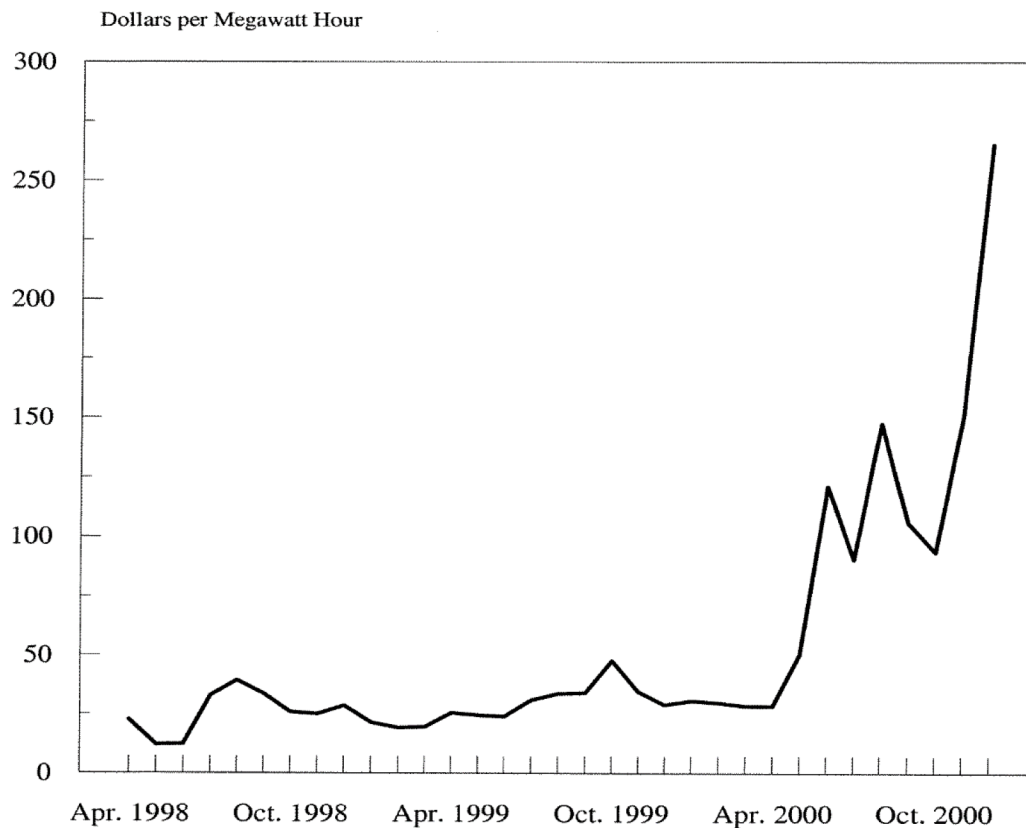
- CA utilities:
 - Made FPA 203 & 205 filings to create CAISO and PX and for sale of generation facilities
- Plan supported by entire CA political establishment
 - Letter to FERC from CA Congressional delegation:
Don't touch a hair on its head
 - FERC staff skeptical of mkt design, separate ISO/PX
 - SDG&E filed proposal at FERC to merge ISO/PX, use LMP, but withdrew proposal after CA political pressure
 - FERC approved CA proposal, market operations began

Crisis Begins

- Spring and Summer of 2000:
 - low wholesale prices through April 2000
 - May - dramatic spike in prices
 - CA wholesale electricity prices up 500%, spiking significantly higher
 - Frequent system emergencies, financial distress
- SDG&E complaint at FERC (8/2/00)
 - Alleged dysfunctional market/harm to consumers
 - Requested \$250/mwh bid cap in PX and real-time markets

Day-ahead prices 1998-2000

FIGURE 4. AVERAGE PRICES THAT UTILITIES PAID FOR ELECTRICITY IN THE CALIFORNIA POWER EXCHANGE'S DAY-AHEAD AUCTIONS, APRIL 1998 THROUGH DECEMBER 2000



SOURCE: Congressional Budget Office based on data for the northern and southern regions from the California Energy Commission (available at www.energy.ca.gov/electricity/wepr/monthly_day_ahead_prices.html).

FERC Response

- FERC order August 2000
 - Denied SDG&E's bid cap request; insufficient evidence to support price cap
 - Opened FPA 206 Investigation
- Wholesale prices continued to soar, utility financial trouble ("buy high, sell low"), CPUC unwilling to raise retail rates, FERC and CA pointed fingers at each other to place blame

FERC Response (continued)

- Nov. 2000 FERC Order -- proposed remedies to address “dysfunctions” in CA market
- December 15, 2000 FERC order set “pay as bid” above \$150 breakpoint, required independent boards for PX and ISO, recommended \$74 price for long term contracts, imposed penalty charge for under-scheduling load, refused to impose West-wide price cap.
- Early 2001: multiple FERC orders allowing \$300-\$400 mwh spot prices.

Crisis Continues

- Jan-April '01: wholesale prices soared unabated over Western Interconnect
- Utilities not creditworthy, defaults, causing some suppliers to withdraw supply. Reliability issues
- DOE emergency orders required generators to sell
- CDWR bought power, average price \$245 mwh
- March - CPUC authorized 30-40% retail rate hike
- PG&E bankruptcy April 2001

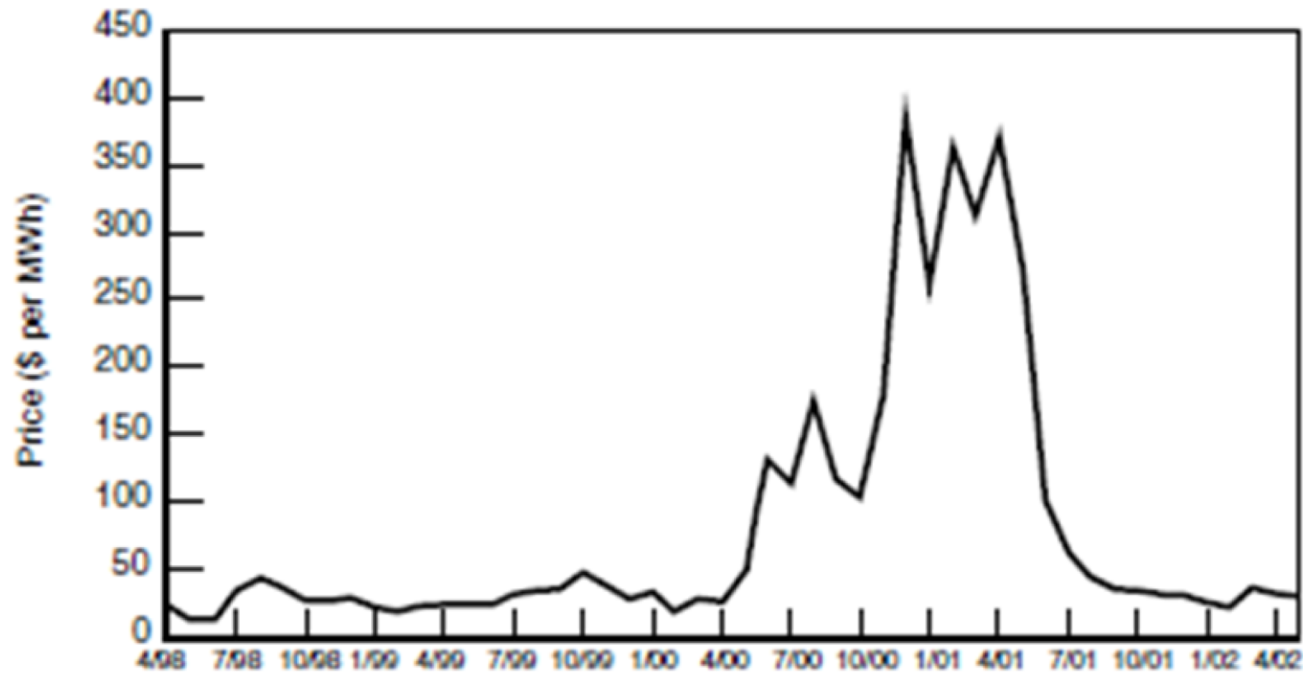
FERC Response

- April 2001 -- more forceful FERC Order adopting monitoring and mitigation for CA markets
 - Must offer requirement for most sellers including munis
 - Load serving entities must submit demand bids identifying price at which load curtailed
 - Price mitigation down to marginal cost of each unit when reserves 7.5% or less
 - Established West-wide FERC investigation
- Reaction: calming influence on the market

FERC Order June 2001

- Forceful order - established comprehensive West-wide mitigation
 - Maximum price set West-wide for all bid-based and bilateral markets during all hours.
 - Must offer requirement West-wide
 - Impact of Order: dramatic cooling off of market, and precipitous drop in wholesale prices
 - After 13 months of market chaos, the crisis subsided

Electricity prices 1998 - 2002



SOURCE: Joskow and Kahn (2001b).

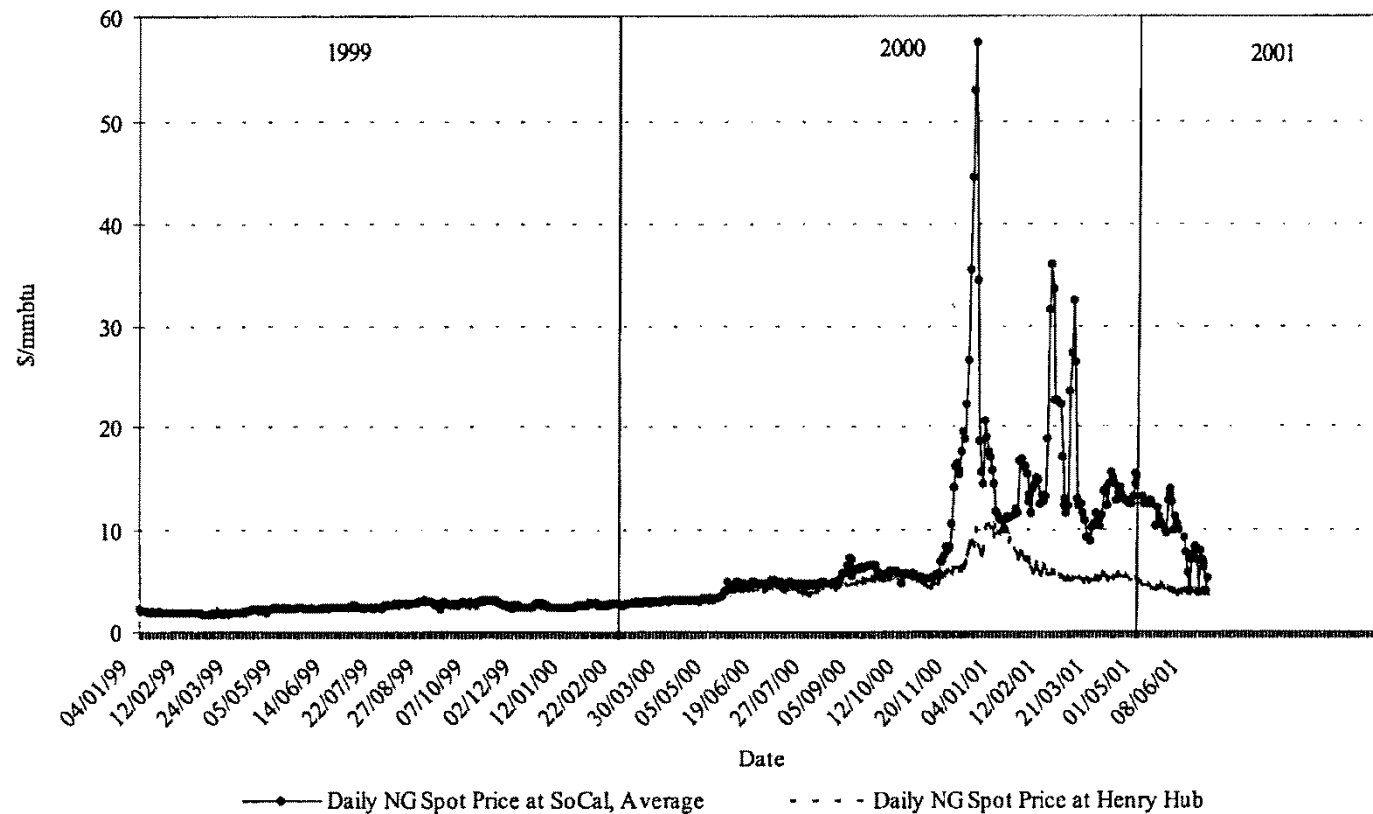
Figure 1.1—Average Wholesale Electricity Prices in California, 1998–2002

Causes of Crisis - Summary

- Significant supply and demand imbalance – low hydro year in CA and NW, new generation had not kept pace with sharp demand increases, big nuke off line, and an unusually hot summer
- Serious market structure and design flaws
- Nat gas prices soared, increased wholesale prices
- Behavior: market power and manipulation in gas and electricity markets
- FERC and CA policymakers in stalemate and slow to order meaningful solutions – finger pointing

Natural gas prices 1999-2001

Figure 2
Southern California and Henry Hub Natural Gas Spot Prices
1 January 1999 to 25 June 2001



Market flaws

- Separation of PX and ISO, poor congestion management, no LMP, market boundaries too small
- General and vague prohibitions on “gaming” and “anomalous behavior”
- FERC: weak penalty authority under FPA
- Retail electricity rate freeze
- Sequential closing of wholesale mkts incented delay in offering supply to fetch highest price
- Over-reliance on spot markets, restrictions on contracting long term

Post-crisis changes to CA market

- Merger of ISO and PX functions into CAISO
 - MRTU (Market Redesign & Technology Update)
- Bid-based security constrained, economic dispatch with locational marginal pricing
- FERC required sophisticated tariff and stronger mkt behavior rules
- EPCRA '05 gave FERC penalty authority of \$1 million per day, per violation

Consequences of Crisis

- CA power costs \$7.5 B in 1999, \$30 B in 2000
- Severe economic disruptions across entire West -- CA Gov. Gray Davis recalled
- Electricity competition unfairly discredited
- FERC proposed Standard Market Design in 2002 to ensure “never again,” but SMD killed by Congress.
- EPCRA 2005 gave FERC tough enforcement power
- Clean-up on refunds via FERC ALJ proceedings and Commission orders continued for years

Lessons Learned

- Poor electricity market structure/design/congestion management will lead to bad market outcome
- Electricity and gas markets – joined at the hip
- Contracting around spot mkts needed to hedge risk
- Retail rates must reflect wholesale prices
- DR is essential to well functioning market
- FERC must not blindly defer to state decisions
- Actual market boundaries are interstate, regional

Lessons Learned (continued)

- FERC must:
 - Insist on good market structure/design, congestion rules, and rational/regional market boundaries
 - Pro-actively monitor to ensure J&R prices
 - Clearly define rules/expectations of market participants
 - Investigate and penalize bad behavior
 - Act quickly and forcefully to impose effective remedies when wholesale markets are out of control
 - Finger pointing between FERC and state officials is recipe for stalemate, inaction and further chaos