Western Power Markets
a Practitioner’s Perspective

Presented by: Paul J. Bonavia
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Xcel Energy

- Public Service Co. of Colorado
- Cheyenne Light Fuel & Power
- Northern States Power
- Southwestern Public Service
Xcel Energy

WSCC

- **Utility**
  - 4% of WSCC Load

- **Generator**
  - 21% of New WSCC Capacity in Past 5 Years
  - Share Fuel and Purchased Energy Costs with Colorado Customers

- **Merchant**
  - Share Trading Margins with Colorado Customers
Western Power Markets

Warrick's Law
- The Market Always Wins

Capps’ Commentary
- Technology Tells What You Can Do
- Economics Tells What You Want To Do
- Politics Tells What You Will Do
Western Power Markets

- What Happened?
- Why Did This Happen?
- What Have We Learned?
Historic Electricity Prices

COB On Peak Monthly Prices

$0.00
$100.00
$200.00
$300.00
$400.00
$500.00
$600.00

Sep-99  Nov-99  Jan-00  Mar-00  May-00  Jul-00  Sep-00  Nov-00  Jan-01  Mar-01  May-01  Jul-01  Sep-01
December 10, 2000 $3,200

Historic Electricity Prices
Why Did This Happen?

Supply

- Natural Gas Price Spikes
- Hydro Output Variation
- 2001 Generation Additions
Historic Natural Gas Prices

Average Monthly Henry Hub Spot Gas Price
Historic Natural Gas Prices

CIG NATURAL GAS DAILY PRICE

[$12.00 $10.00 $8.00 $6.00 $4.00 $2.00 $0.00]

Hydro Generation

PACIFIC NORTHWEST HYDRO GENERATION

Average MW

Sources: U.S. Army Corps of Engineers and PIRA
## 2001 New Capacity Additions - Commercial Availability

<table>
<thead>
<tr>
<th>MONTH</th>
<th>PROJECT</th>
<th>MW</th>
<th>AREA</th>
<th>DEVELOPER</th>
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<tr>
<td>May</td>
<td>South Point</td>
<td>545</td>
<td>AZ</td>
<td>Calpine</td>
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<tr>
<td>May</td>
<td>Fort St. Vrain</td>
<td>235</td>
<td>CO</td>
<td>Xcel</td>
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<td>June</td>
<td>Griffith Energy</td>
<td>595</td>
<td>AZ</td>
<td>Duke</td>
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<td>June</td>
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<td>AZ</td>
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<tr>
<td>June</td>
<td>Klamath Falls</td>
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<td>OR</td>
<td>Klamath Cogen</td>
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<tr>
<td>June</td>
<td>Proctor &amp; Gamble</td>
<td>40</td>
<td>No. CA</td>
<td>Proctor &amp; Gamble</td>
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<td>240</td>
<td>CO</td>
<td>Black Hills Gen</td>
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<td>No. Nev.</td>
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<td>Wild Flower</td>
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<td>So. CA</td>
<td>Indigo</td>
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<td>Rathdrum</td>
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<td>ID</td>
<td>Cogentrix/Avista</td>
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<td>AES</td>
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<td>Sunrise</td>
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<td>Cen. CA</td>
<td>Edison Mission</td>
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Western Power Markets

Why Did This Happen?

Demand

- June 2000 CAISO Average Daily Peak Load Increased 13% vs. June 1999
- Dramatic Reduction in Summer 2001 Daily Peaks
CALIFORNIA PEAK LOAD TAKES A DIVE
Number of hours CAISO load exceeded 40,000 MW

August 2001 through to August 18
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Why Did This Happen?

2001 VS. 2000

6 - 7000 MW Reduction in CA/NW Peak Loads

+ 6000 MW Capacity Additions.

= 12 - 13,000 MW Swing In Load / Resource Balance
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Why are Price Variances so Steep?

- Inelastic Demand -- Duty to Serve
- Technology & Infrastructure Limitations
- Prudent Risk Management
Risk Management

- Price Risk (Value at Risk)
- Credit Risk
- Operating Risk
- Transmission Risk
- Regulatory Risk
What Have We Learned?

Warrick & Capps are Both Right
What Have We Learned?

“...help, or at least do no harm.”

Hippocrates
What Have We Learned?

“If it were done when ‘tis done, then ‘twere well it were done quickly.”

William Shakespeare,

Macbeth, Act 1, Scene 7
What Have We Learned?

“Don’t look back…”

Satchel Paige
What Have We Learned?

“One can not step in to the same river twice.”

Heraclitus