



# **Western Market and Infrastructure Assessment**

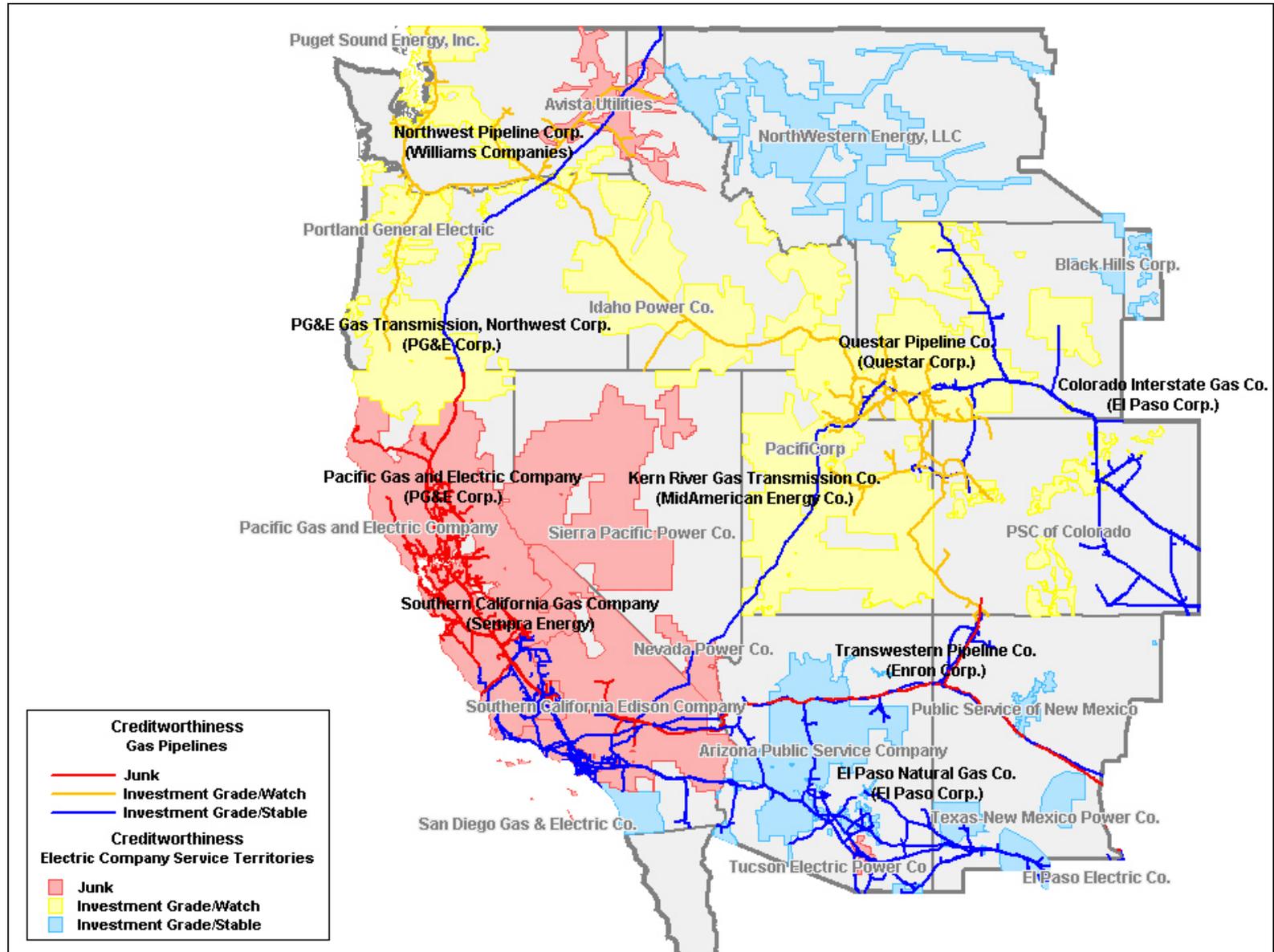
## **FACTORS AFFECTING ELECTRIC AVAILABILITY AND PRICES**

**Docket No. AD02-20-000  
Presentation for Commission Meeting July 17, 2002  
Item No. A-3**

# Economic Conditions

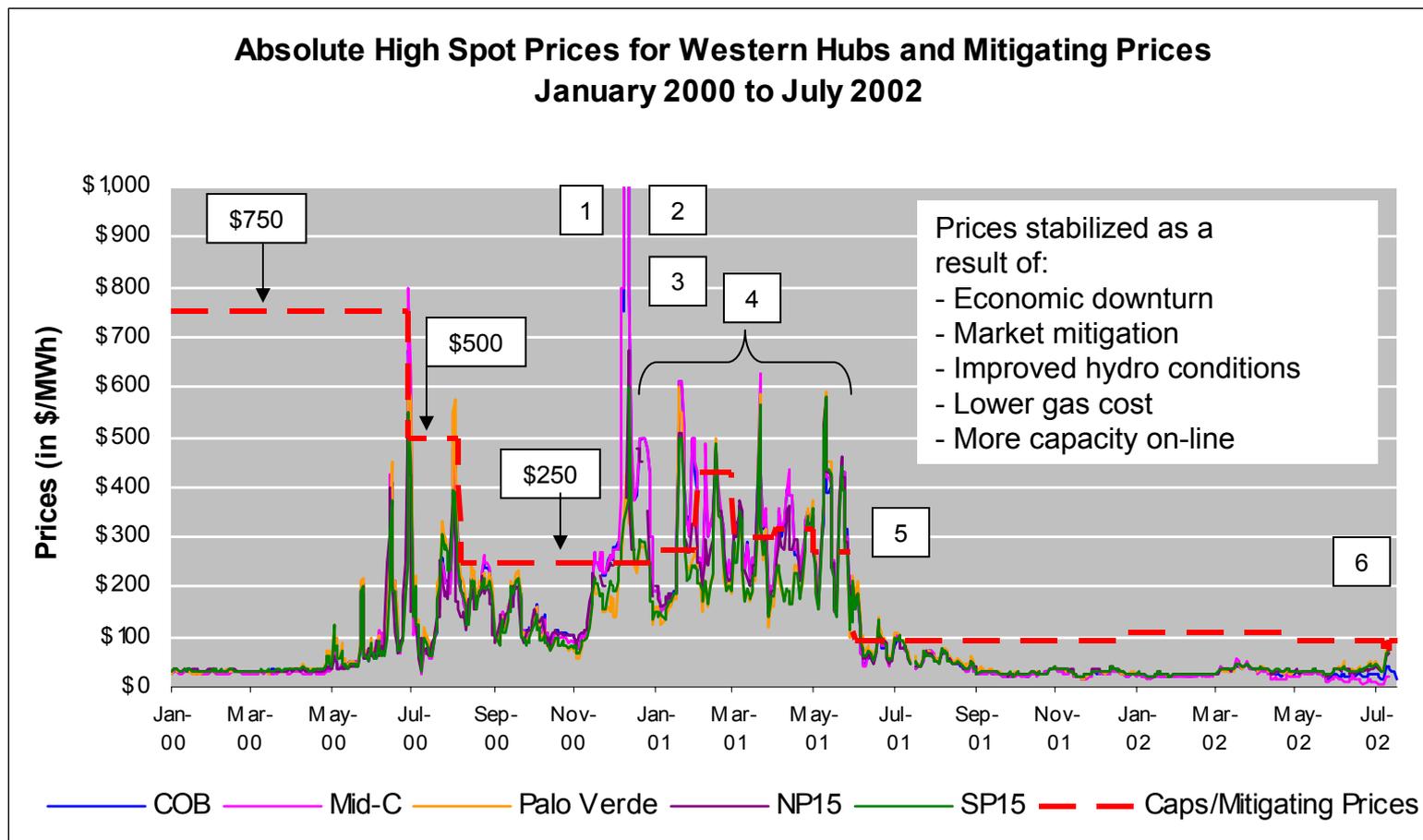
- Population and economic growth in the West were highest in the states bordering California, from 1995 to 2000.
- Starting in 2001, all western states experienced an economic slowdown contributing to a decline in electric and gas demand.
- Through 2010, growth estimates for population and retail electric sales are projected to be highest in the regions bordering California.

# Downgraded credit ratings impact infrastructure expansion across the West



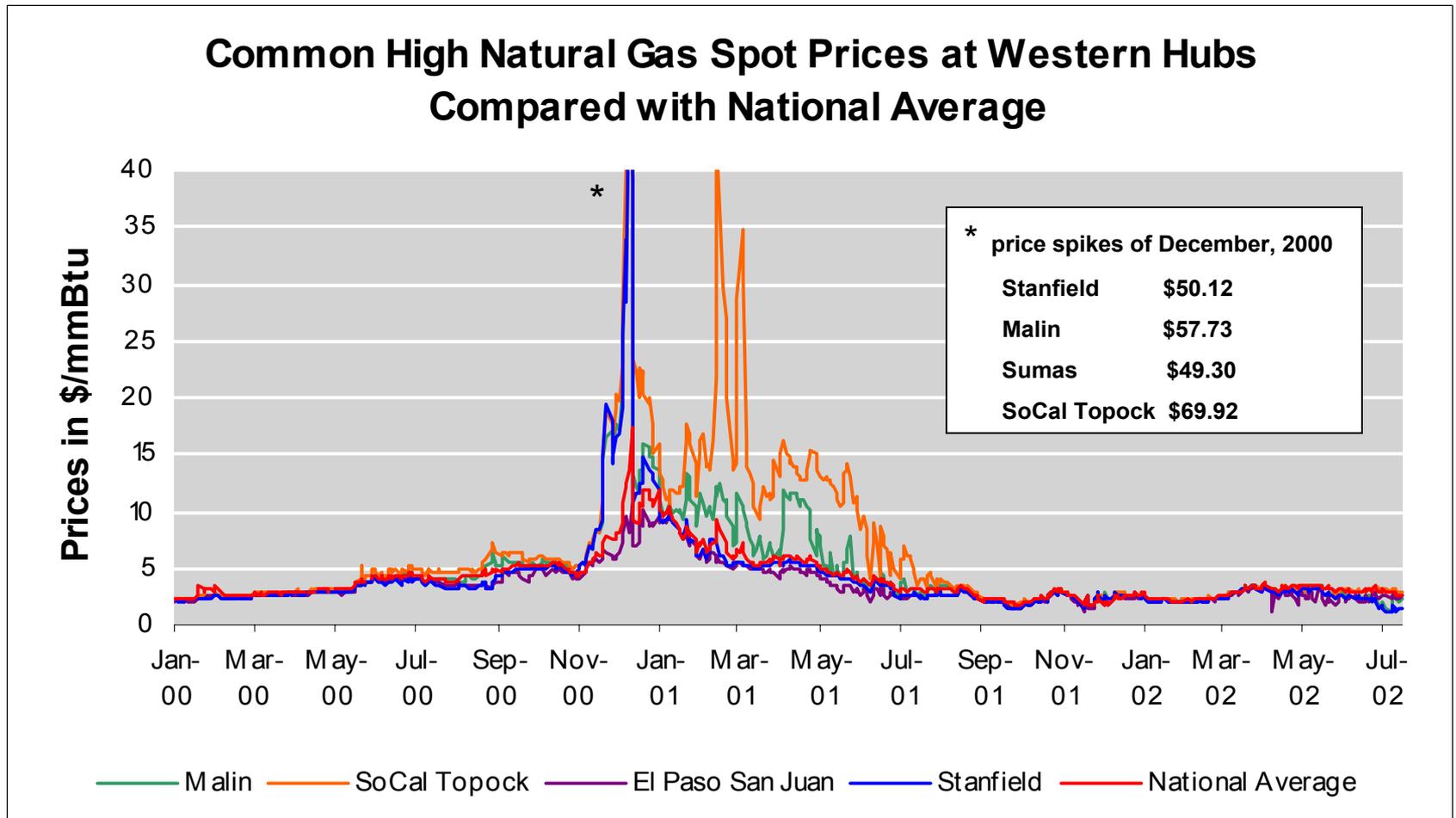
Source: RDI PowerMap, Standard and Poor's ratingsdirect.com

# Western states electric prices have fallen and stabilized in the short-term



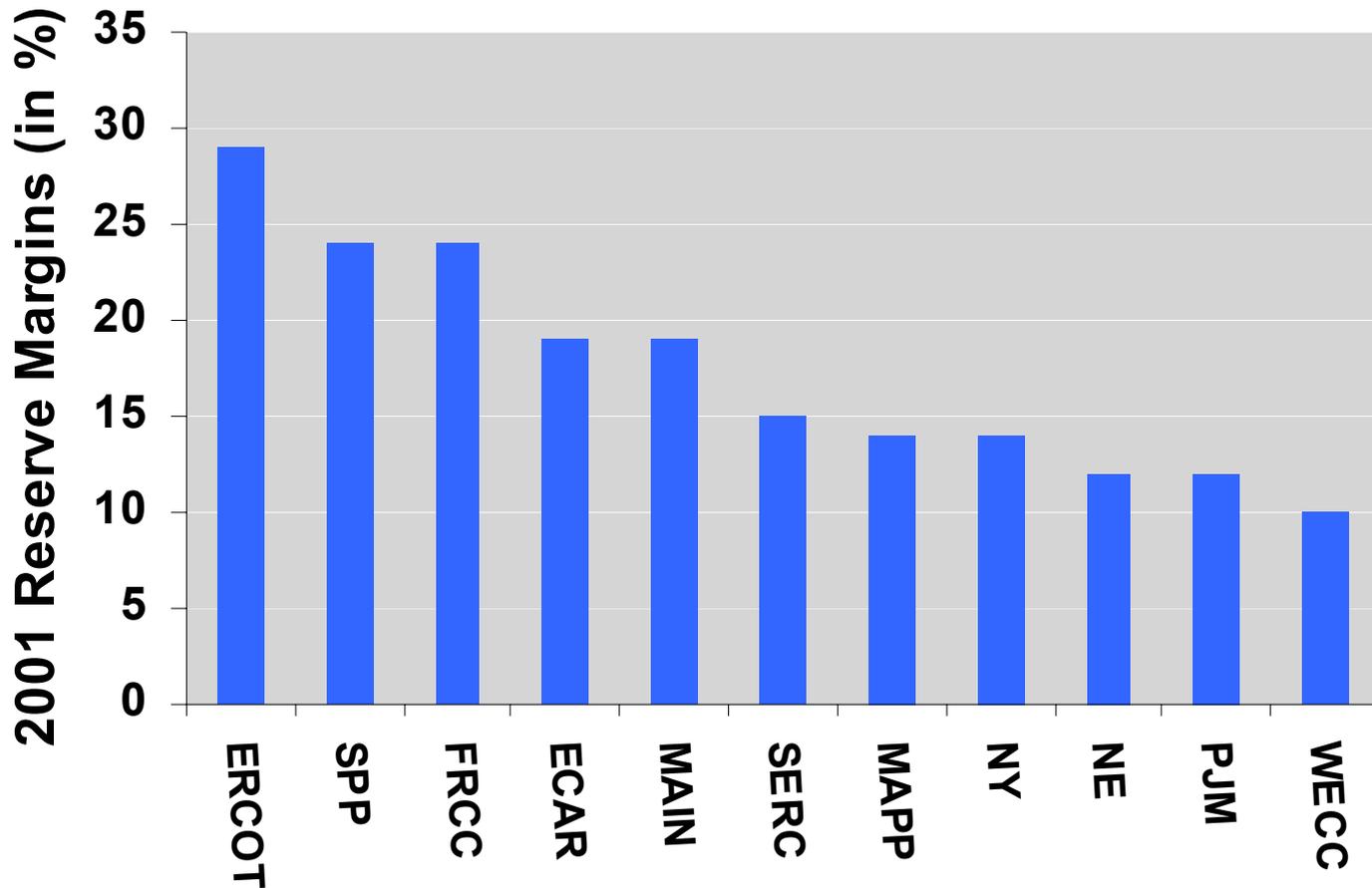
1. On December 11, 2000, electric spot prices soared to \$3000 at COB and \$5000 at Mid-C.
2. CAISO \$250 breakpoint, December 8 through December 31, 2000.
3. FERC \$150 breakpoint, January 1 through May 28, 2001.
4. FERC established ceiling price for Stage Three Emergency on March 9, 2001:  
\$273 for January, \$430 for February, \$300 for March, \$318 for April and \$267 for May, 2001.
5. Price mitigation in effect for California only during reserve deficiency hours, May 29 through June 19, 2001. \$108 triggered on May 30, 2001. Non-emergency price at \$91.87, which is 85% of price declared during last Stage One Emergency. Westwide Price Mitigation began on June 20, 2001.
6. On July 9, 2002, the CAISO issued a Stage One alert and dropped the cap to \$57.14/MWh. Price cap was reset at \$55.26 on July 10 triggered by a Stage Two. On July 11, 2002, the FERC restored the cap to its previous level of \$91.87/MWh and fixed it as a "hard cap".

## Natural gas prices have stabilized in the short term



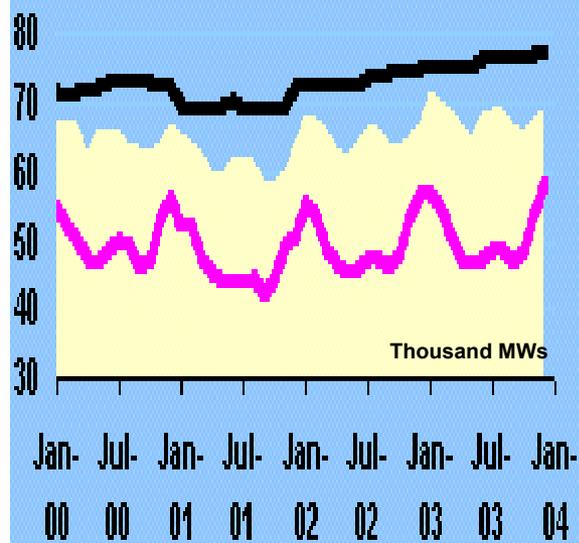
Source: Gas Daily

# WECC Reserve Margins are among the lowest in the country

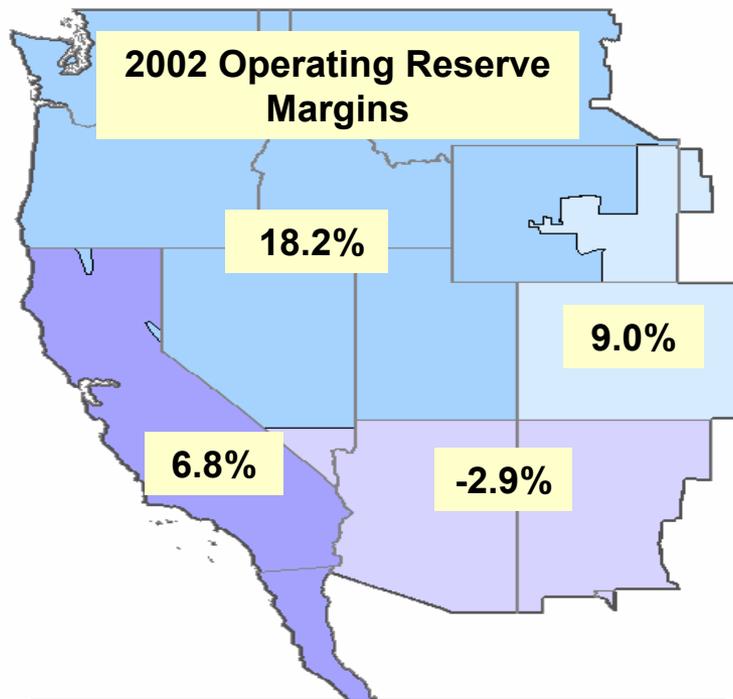


Source: Spring 2002 CERA Watch *Power Sector Outlook 2002: Survival of the Fittest*

**NWPA (US & CAN)**



**Generating adequacy varies by sub-region; CAMX, AZNMNV, & RMPA face continuing tight operating reserve margins through 2002**



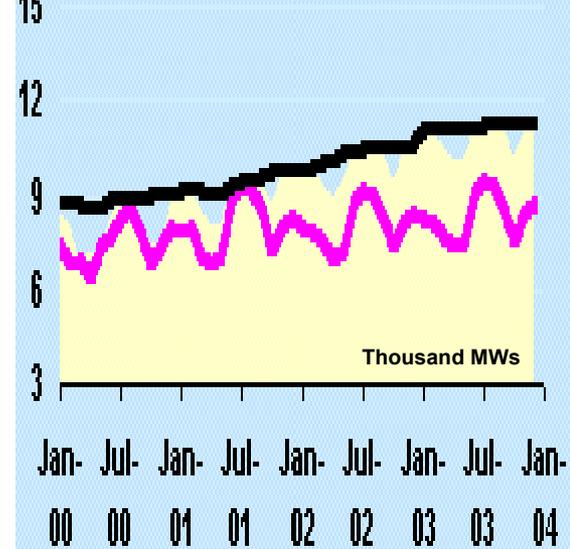
Operating Reserve Margin: difference between available capacity (excluding transfers) and peak demand

Reserve Margin: difference between total resources (excluding transfers) and peak demand

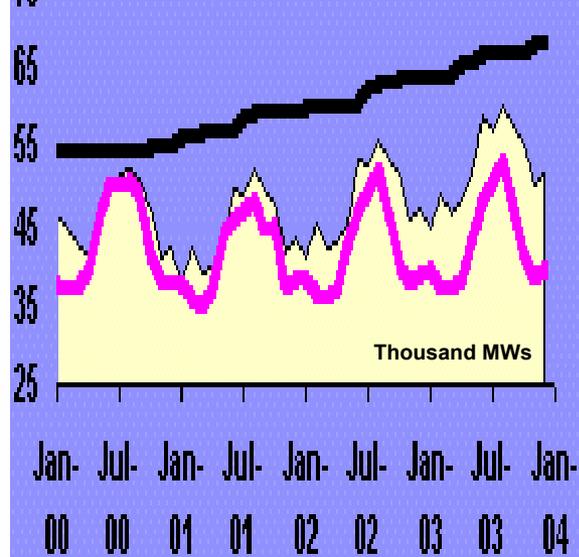
— Total Resources    Available Resources    Peak Demand

Source: Western Electricity Coordinating Council  
2001-2002 Load & Resource Reports and RDI  
PowerDat & NewGen June 2002

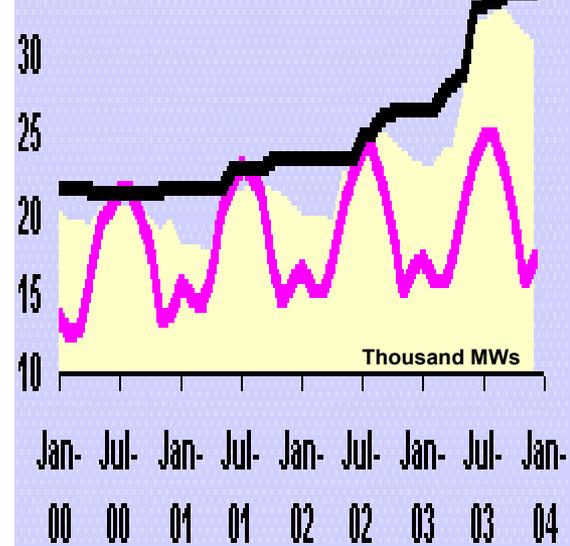
**RMPA**



**CAMX (US & MX)**



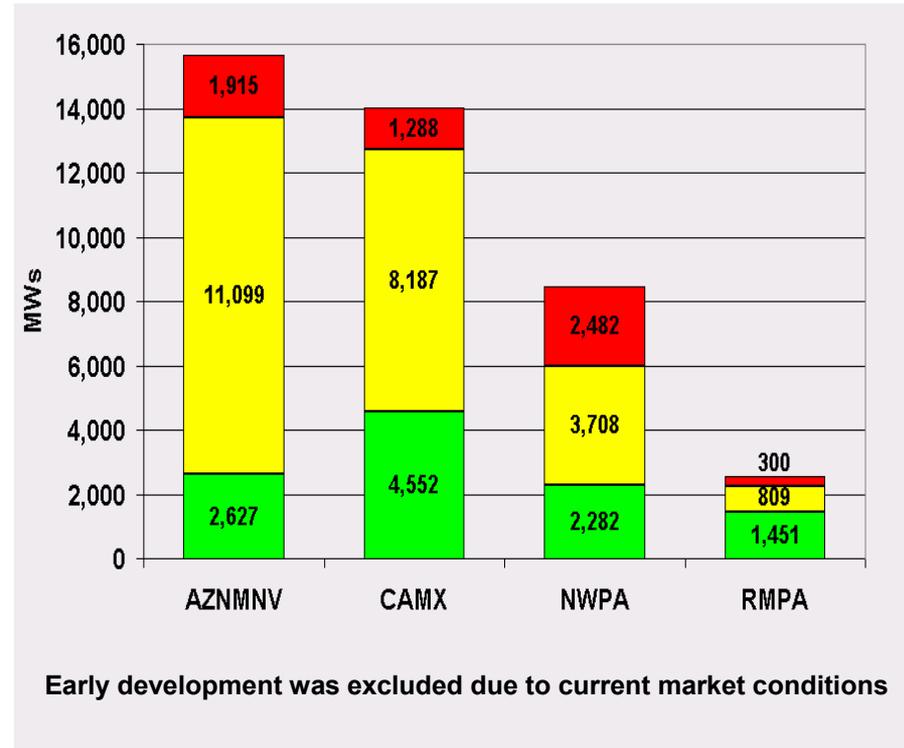
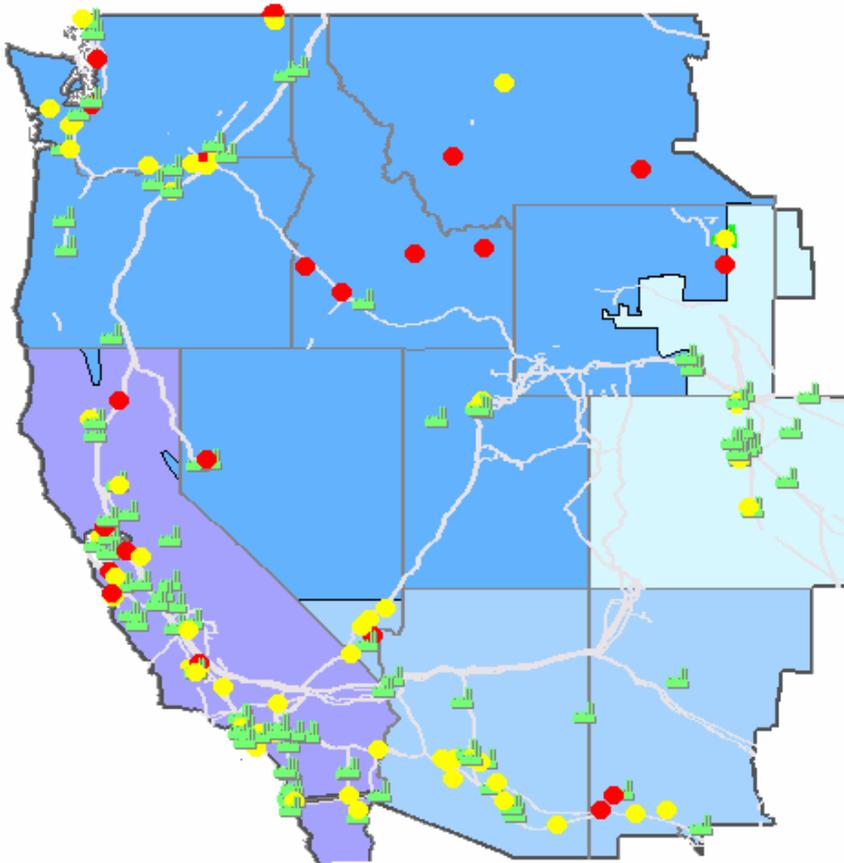
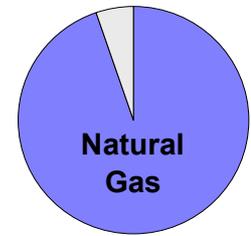
**AZNMNV**



Jan-00 Jul-00 Jan-01 Jul-01 Jan-02 Jul-02 Jan-03 Jul-03 Jan-04

Jan-00 Jul-00 Jan-01 Jul-01 Jan-02 Jul-02 Jan-03 Jul-03 Jan-04

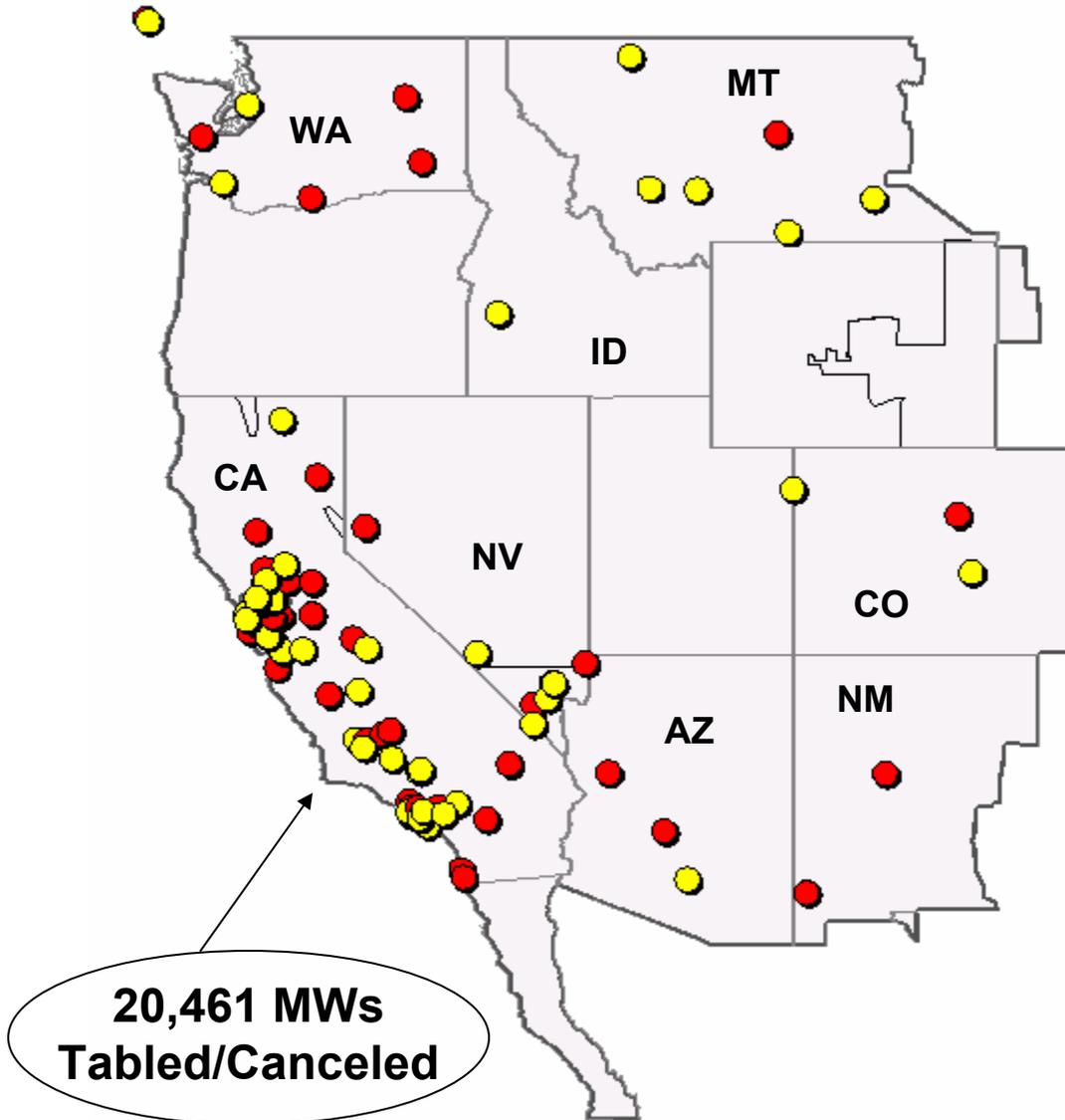
# 95% of the new generation entering western markets will be fueled by natural gas



- Advanced Development 2002-2005
- Under Construction 2002-2005
- Additions Jan 2000- May 2002

Source: RDI NewGEN and PowerDat June 2002

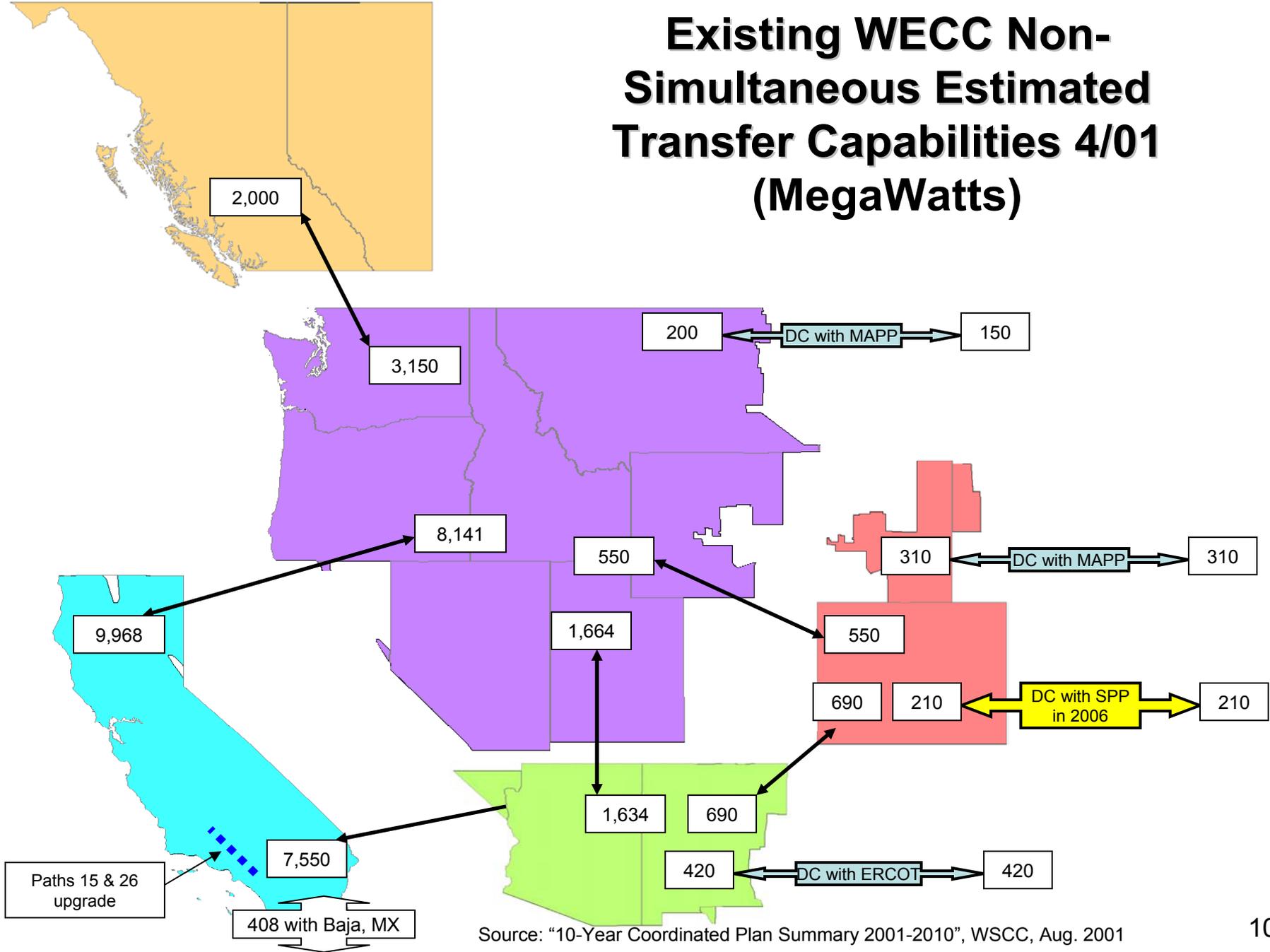
**Lower spark spread outlooks, thinner profit margins, and industry uncertainty diminish the incentive to build new power plants. Many projects have been tabled or canceled particularly in California**



STATUS	YEAR	TOTAL (MWs)
Tabled	2000	1,403
	2001	8,732
	2002	14,363
	Total	<b>24,498</b>
Canceled	2000	1,042
	2001	9,752
	2002	4,797
	Total	<b>15,591</b>
Total Tabled & Canceled	All	<b>40,089</b>

Source: RDI NewGEN June 2002

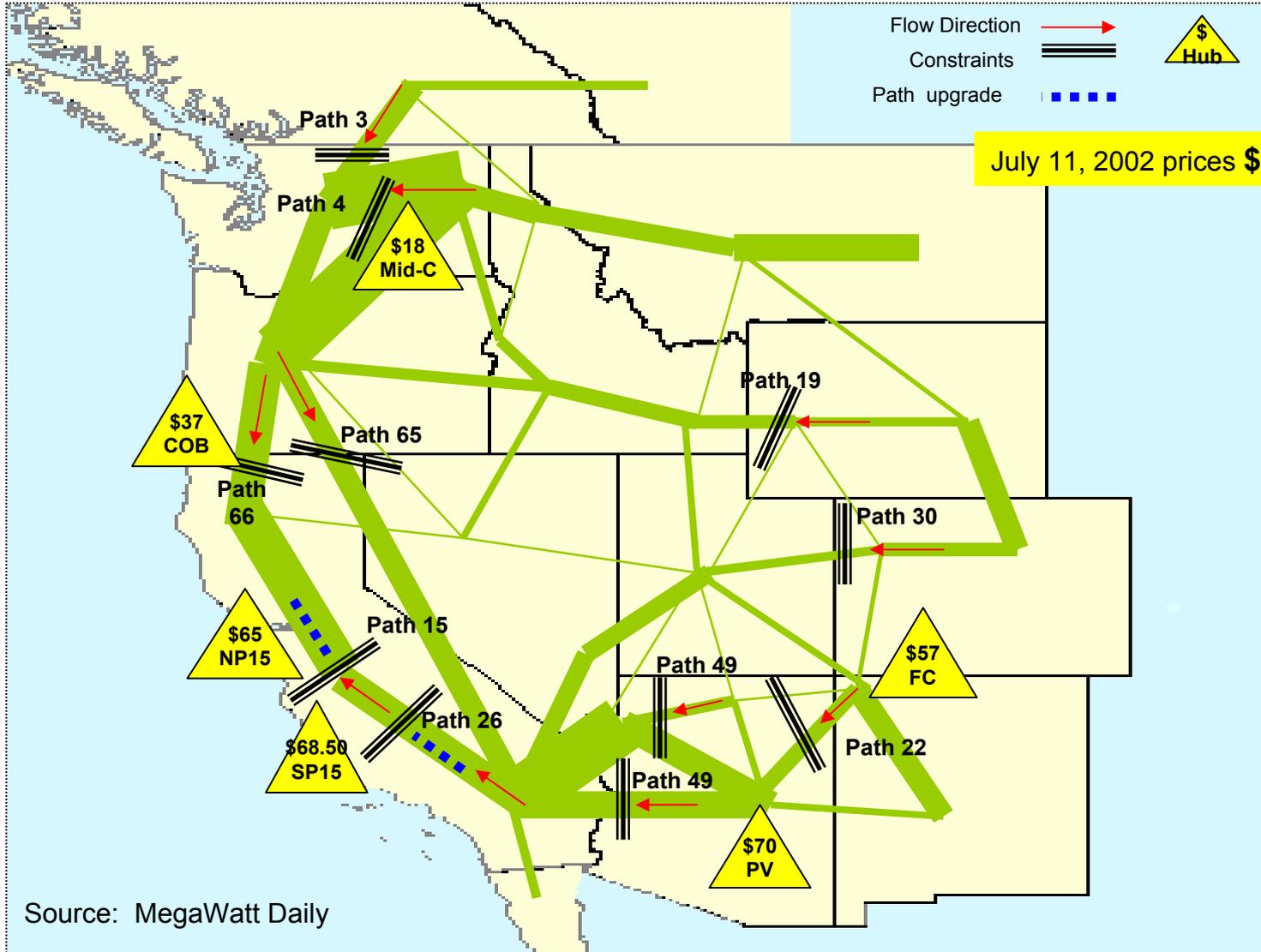
# Existing WECC Non-Simultaneous Estimated Transfer Capabilities 4/01 (MegaWatts)



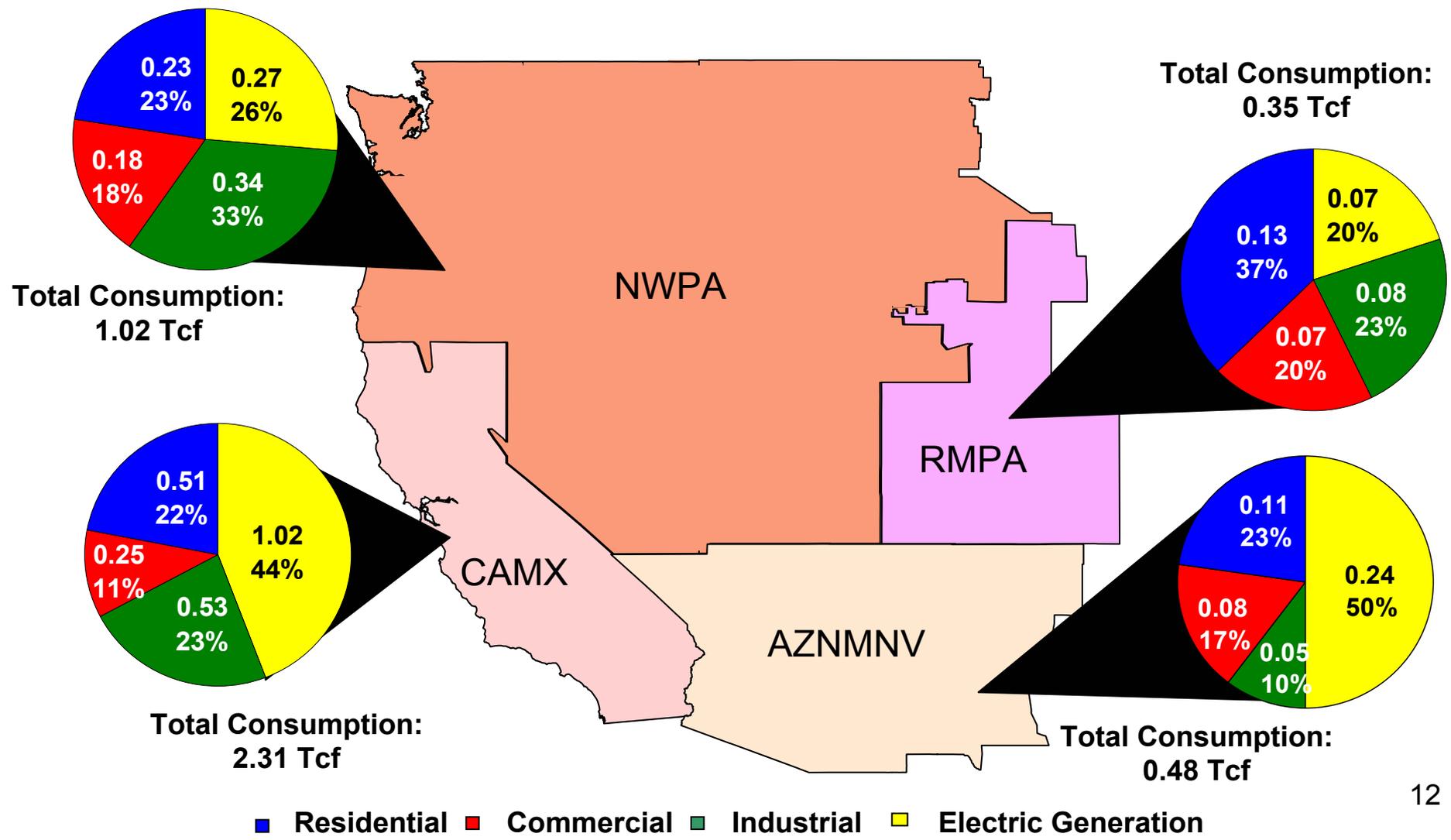
Source: "10-Year Coordinated Plan Summary 2001-2010", WSCC, Aug. 2001

# Transmission constraints limit export capabilities which result in price differentials

## WECC Transmission Constraints and High Electric Spot Prices

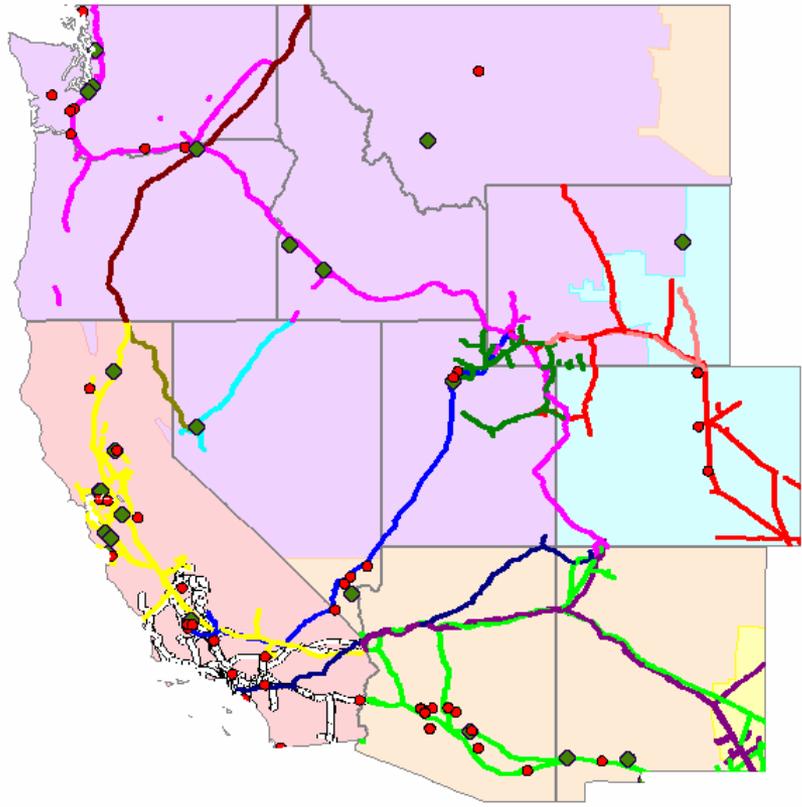


# In 2001, California was the major gas consumer in the WECC; electric generation and industrial use are and should continue to be the dominant consumption sectors (consumption by sector in Tcf/year)



# Over the next five years, new power plant demand for natural gas could increase by 30% to 140% over current levels

NWPA	Gas-Fired Gens (MW)	Related Gas Demand (MMcf/d)
Existing	6000	572
2002	1936	189
2003	1876	183
2004	1288	126
2005	898	88
Total Additions	5998	586



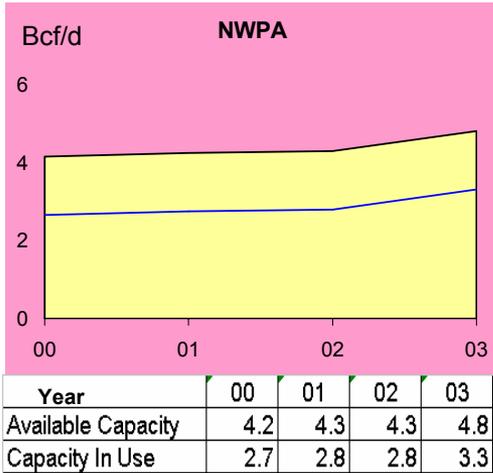
RMPA	Gas-Fired Gens (MW)	Related Gas Demand (MMcf/d)
Existing	3329	267
2002	249	24
2003	480	47
2004	50	5
2005	0	0
Total Additions	779	76

CA	Gas-Fired Gens (MW)	Related Gas Demand (MMcf/d)
Existing	32,542	3071
2002	3048	298
2003	4776	467
2004	1110	108
2005	500	49
Total Additions	9434	922

● Under Construction  
◆ Advanced Development

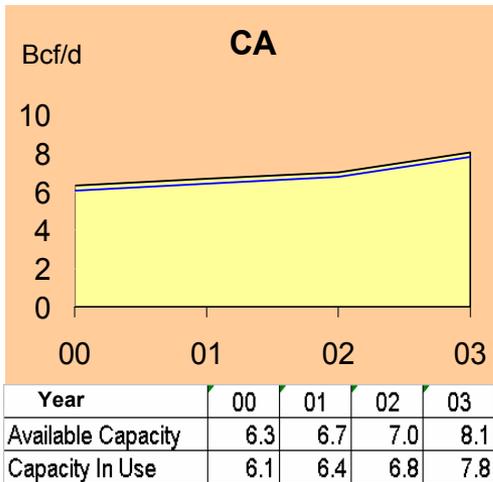
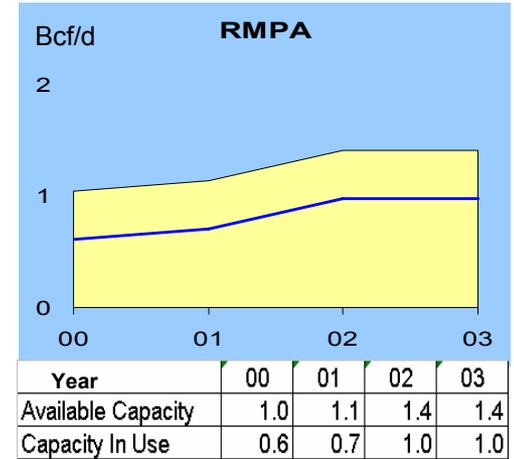
AZNMNV	Gas-Fired Gens (MW)	Related Gas Demand (MMcf/d)
Existing	9704	925
2002	2991	292
2003	7843	767
2004	1720	168
2005	600	59
Total Additions	13154	1286

# Pipelines in the Southwest and up to the California state line are utilized at a level close to their coincidental peak day levels

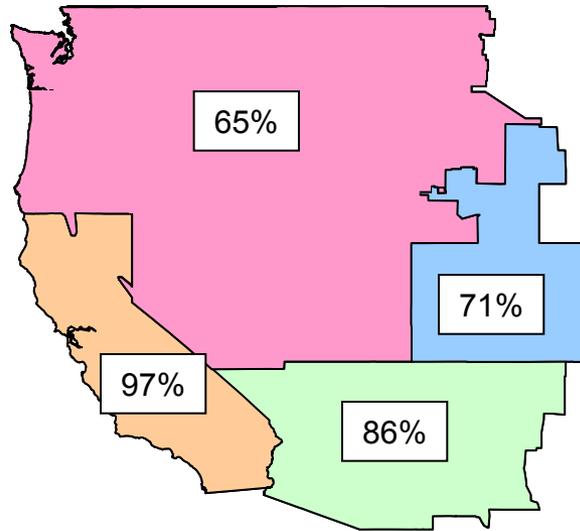


Pipeline usage\* in the WECC (in Bcf/day)

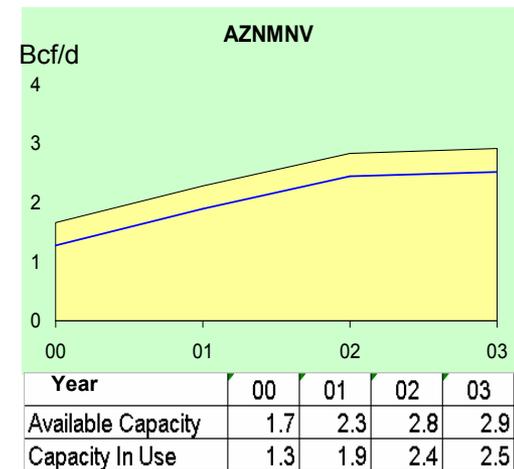
\* Coincidental peak flow serves as a proxy for pipeline capacity



Reflects interstate flows at the California border



**Coincidental Peak Flow**  
 **Average Flow**  
% **Capacity Utilized in 2002**



# Conclusions

- Given current Western US infrastructure, there is not enough excess electric capacity to support a fully competitive market during periods of peak demand.
- The Western energy markets are susceptible to disruption by one or more events, i.e. accelerating economic growth, widespread high temperatures, and/or low precipitation, causing low reliability and volatile prices.
- Energy infrastructure expansion is needed for competitive electric markets in the Western US.

# Western Market Infrastructure Assessment Team

## **Commission Meeting Presenters:**

- David Lengenfelder, OMOI (Team Leader) – Introduction & Economic Conditions
- Camilla Ng, OMTR – Electric and Natural Gas spot prices
- Brian Harrington, OMTR – Electric Supply and Demand
- Meesha Bond, OMTR – Electric Transmission
- Jeff Wright, OEP – Natural Gas Supply and Demand

## **Contributing Team Members:**

- Charles Hall, OEP
- Karen Jacobs, OEP
- Thanh Luong, OMTR
- Kenneth Niehaus, OEP
- Jonathan Ogur, OMTR
- John Schnagl, OEP