



The California Electricity Crisis:

Causes and Lessons Learned

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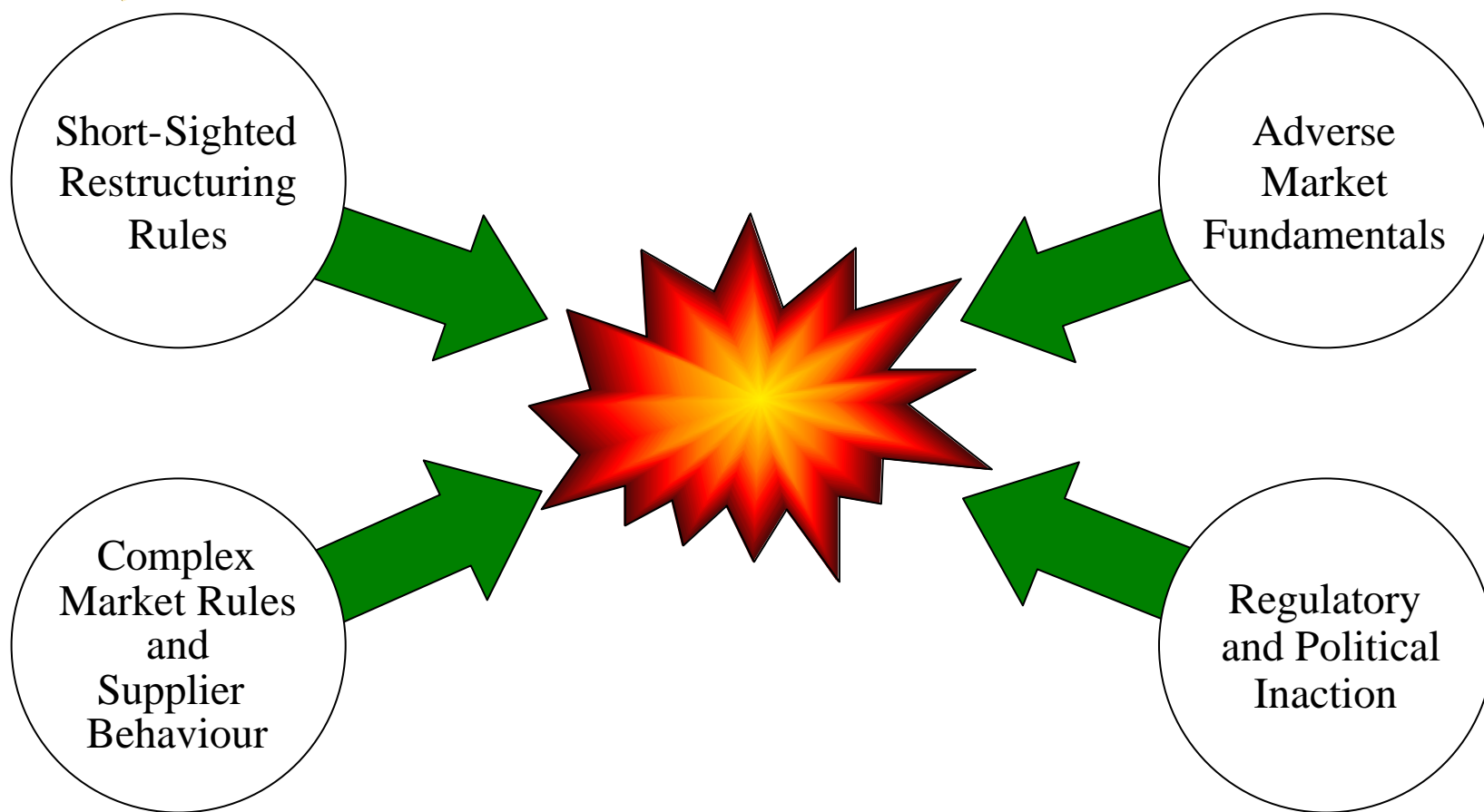


Outline

- What happened?
- Why did it happen?
- What lessons should we learn from it?

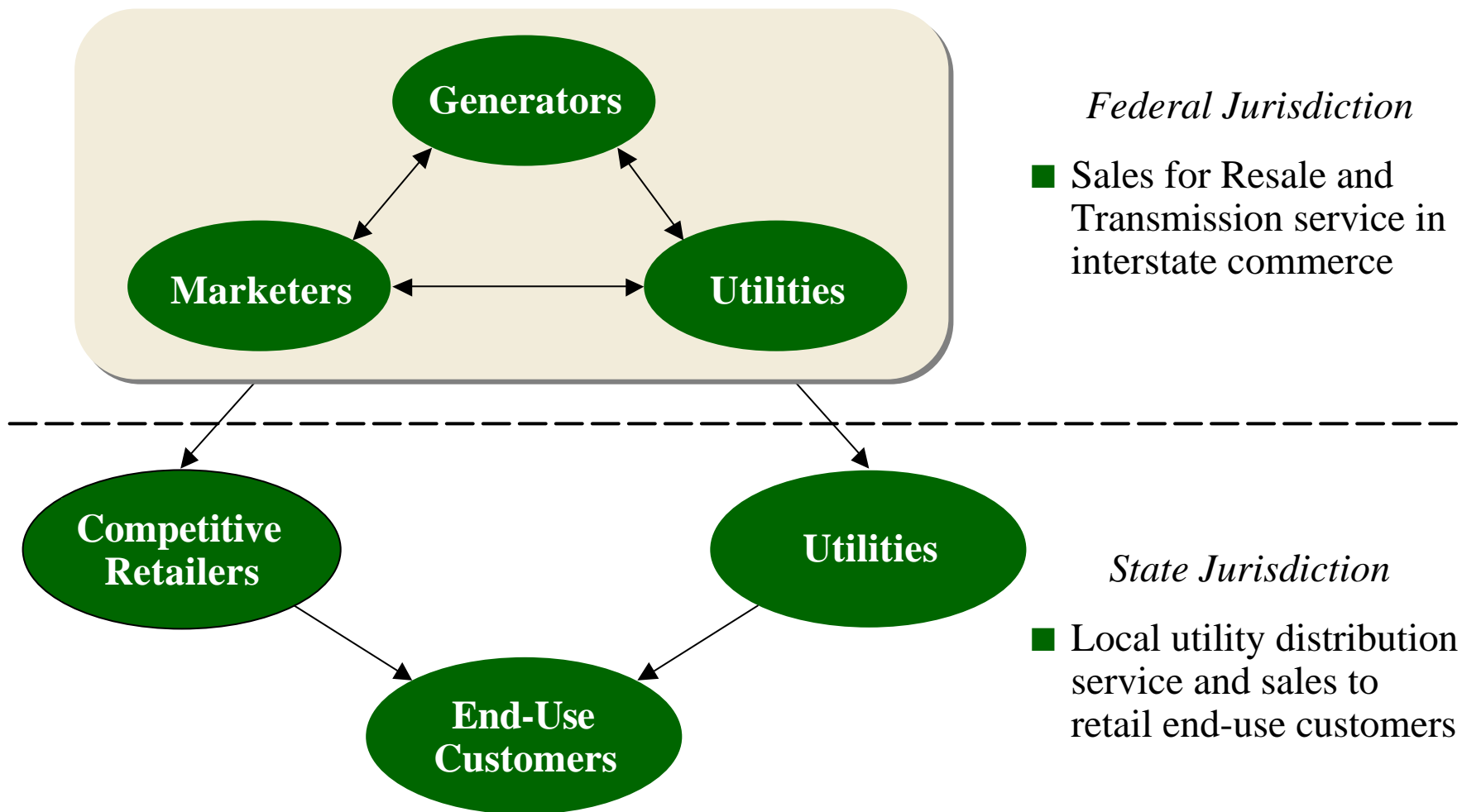


The Making of California's Electricity Crisis

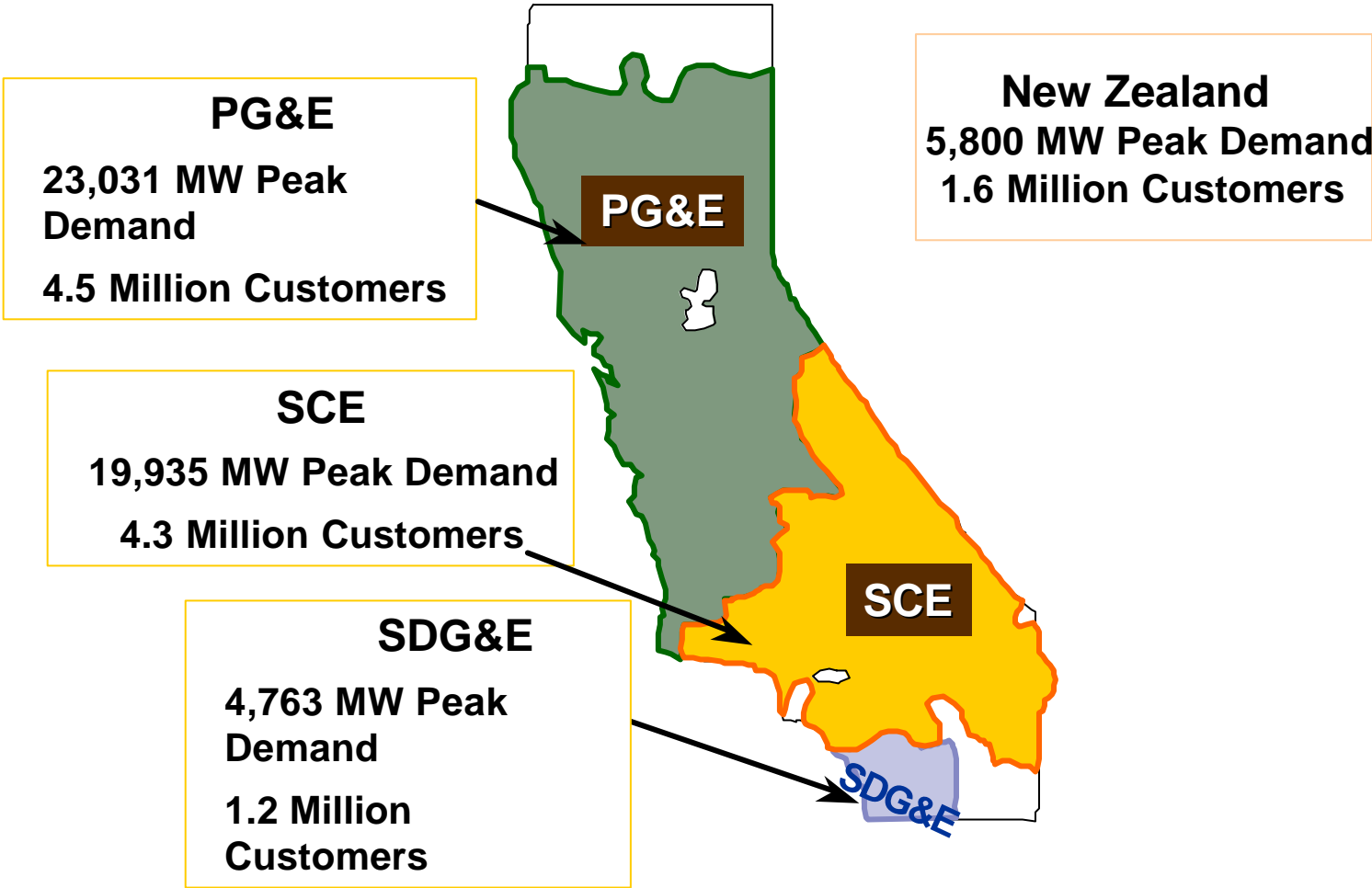




Regulatory Jurisdictions in the United States

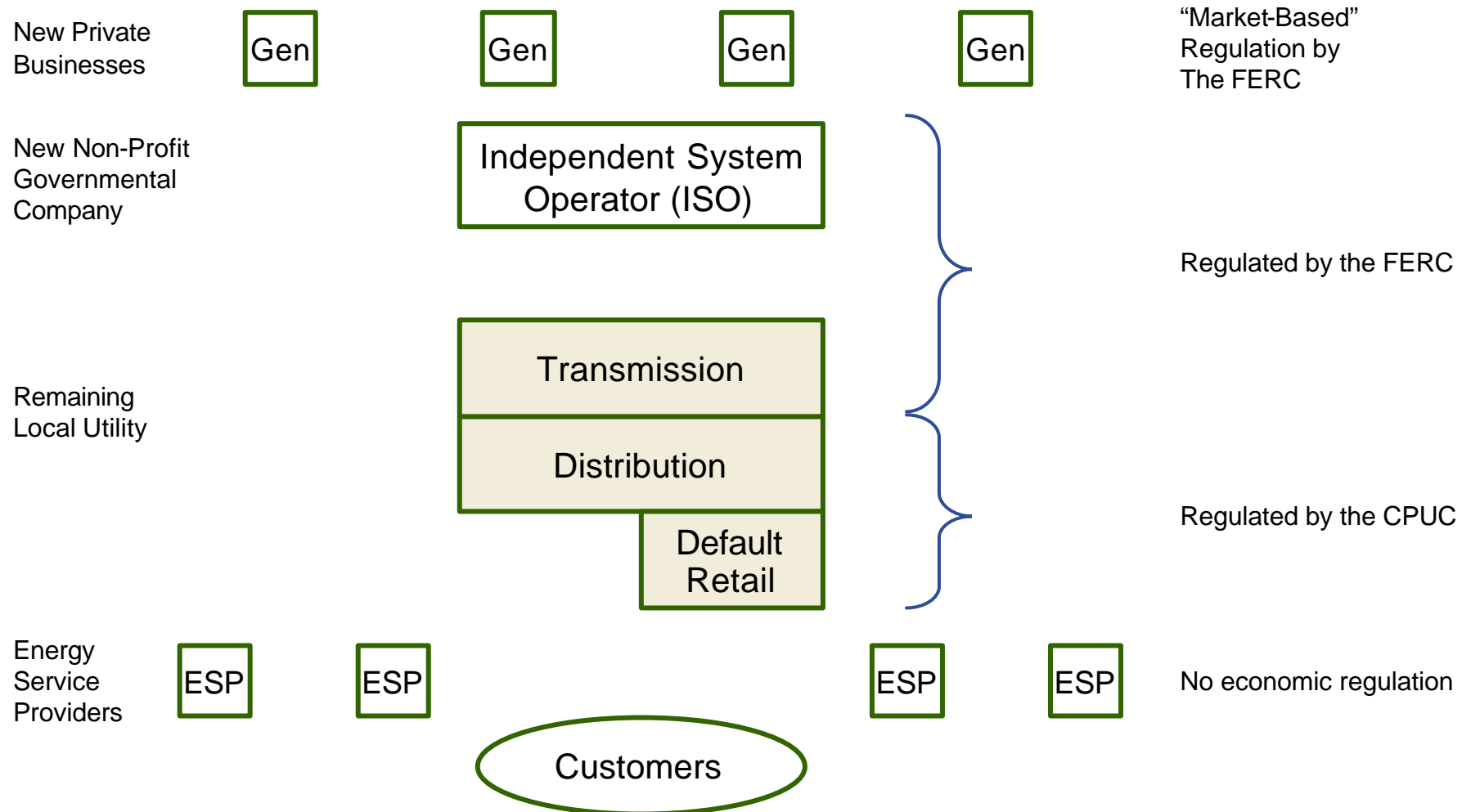


California's Major Investor-Owned Utilities

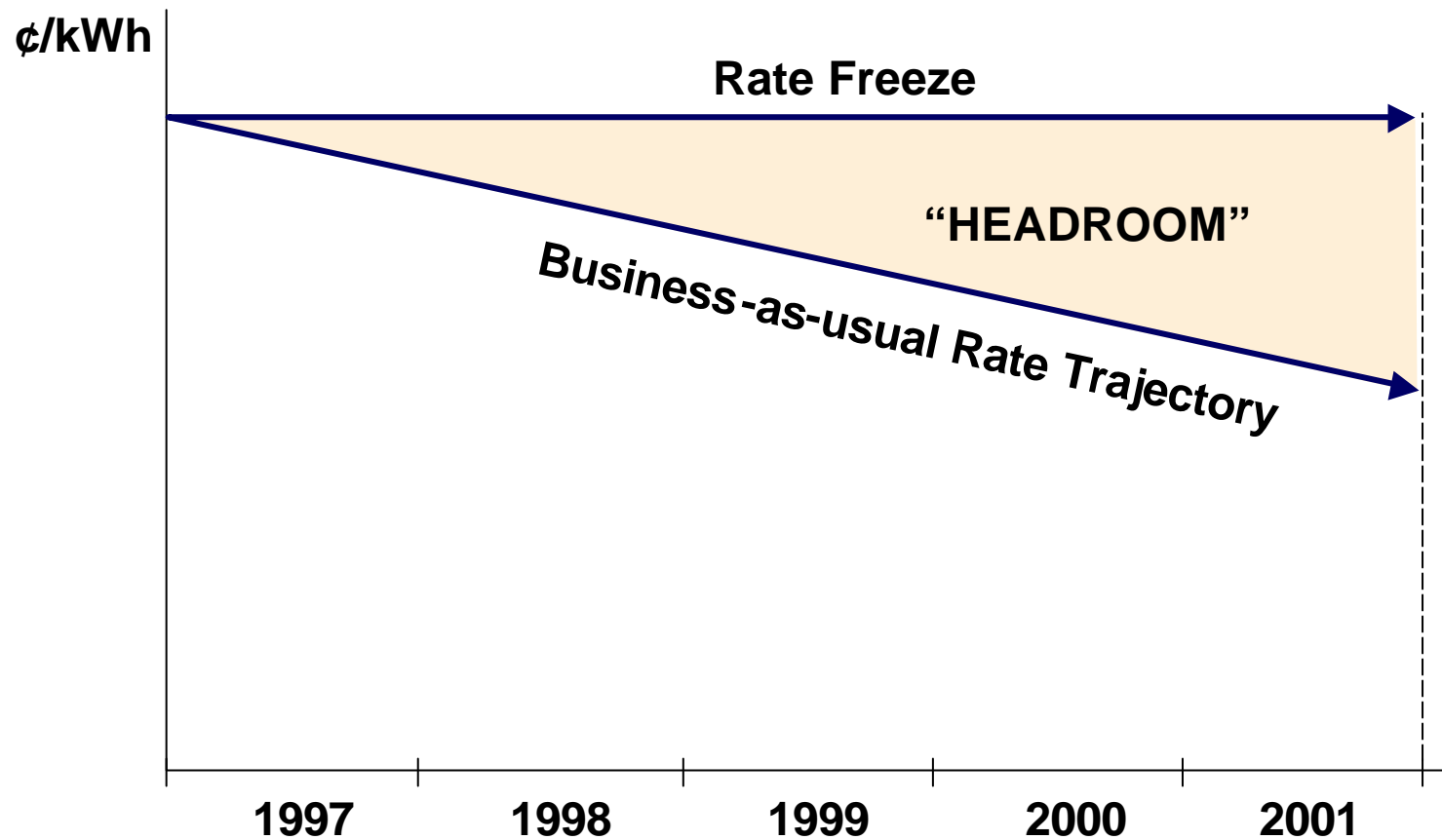




The New California Structure

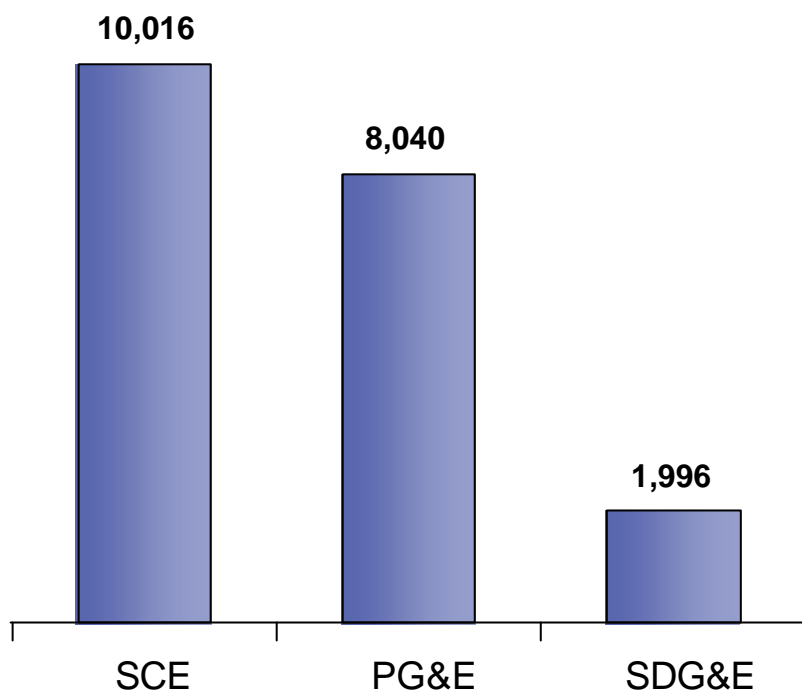


Rate Freeze Creates “Headroom” for Transition Cost Recovery





California Generation Divestiture



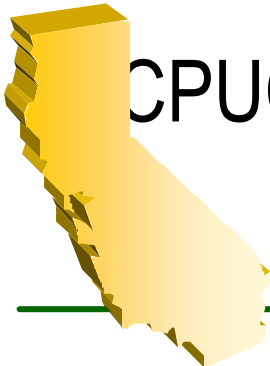
■ 20,212 MW Divested so far

■ New owners:

AES	4,076
Calpine	1,224
DukeEnergy	3,751
Dynegy	3,447
Port of San Diego	713
Reliant	3,776
Southern	3,065
Thermo Ecotek	280

■ Sales proceeds used to reduce customer stranded cost obligation

■ Market valuation of remaining non-nuclear generation (over 6,000 MWs) required by year-end 2001



CPUC Initially Insisted that Utilities Buy Everything Through the PX and ISO Spot Markets?

- Wanted transparent pricing to assure against self-dealing
- Did not want utilities incurring long-term obligations and potentially stranded costs in their role as default provider
- Wanted to encourage independent retailers
 - Customers wanting price hedges should seek them from ESPs



Key Restructuring Rules Created Over-Exposure To Spot Market

- CPUC's requirement that utilities buy all power through Power Exchange and ISO
 - Generation divestiture without buy-back contracts
 - Retail rate freeze
- Over-exposure to the spot market

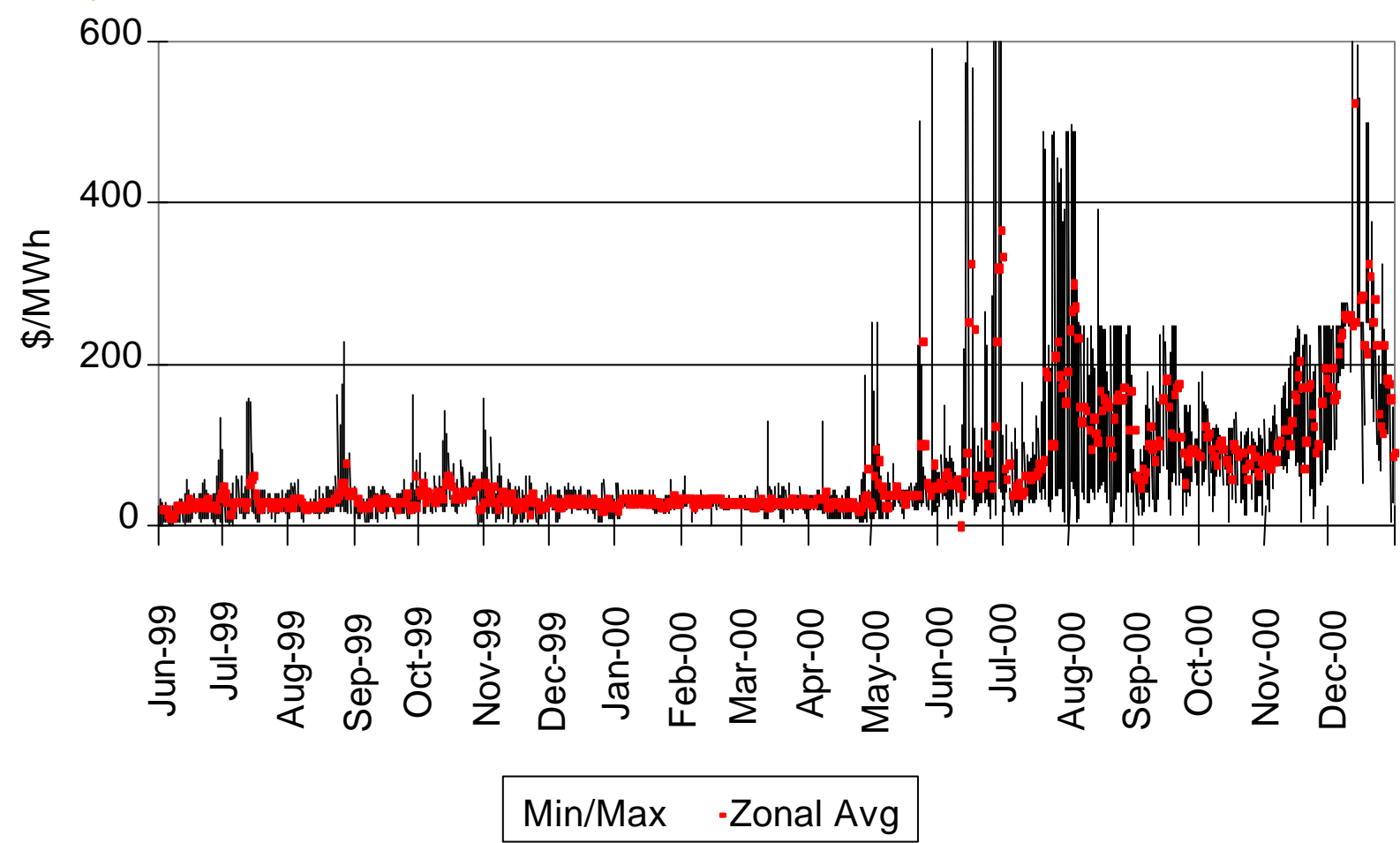


California's Electricity Market Crisis





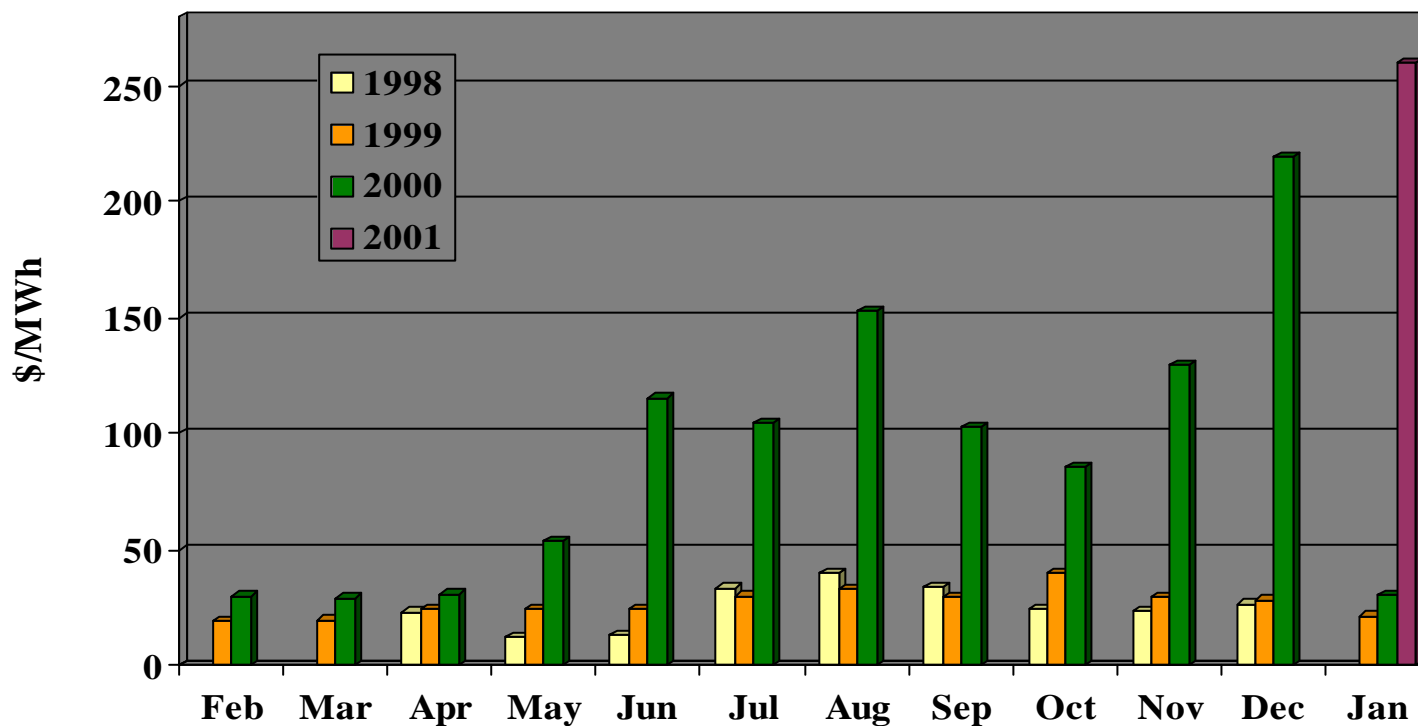
California Day-Ahead Electricity Prices (PX - Southern Zone)





California Market Prices Have Skyrocketed in 2000

Comparison of Average Cal PX SP15 Monthly* Prices



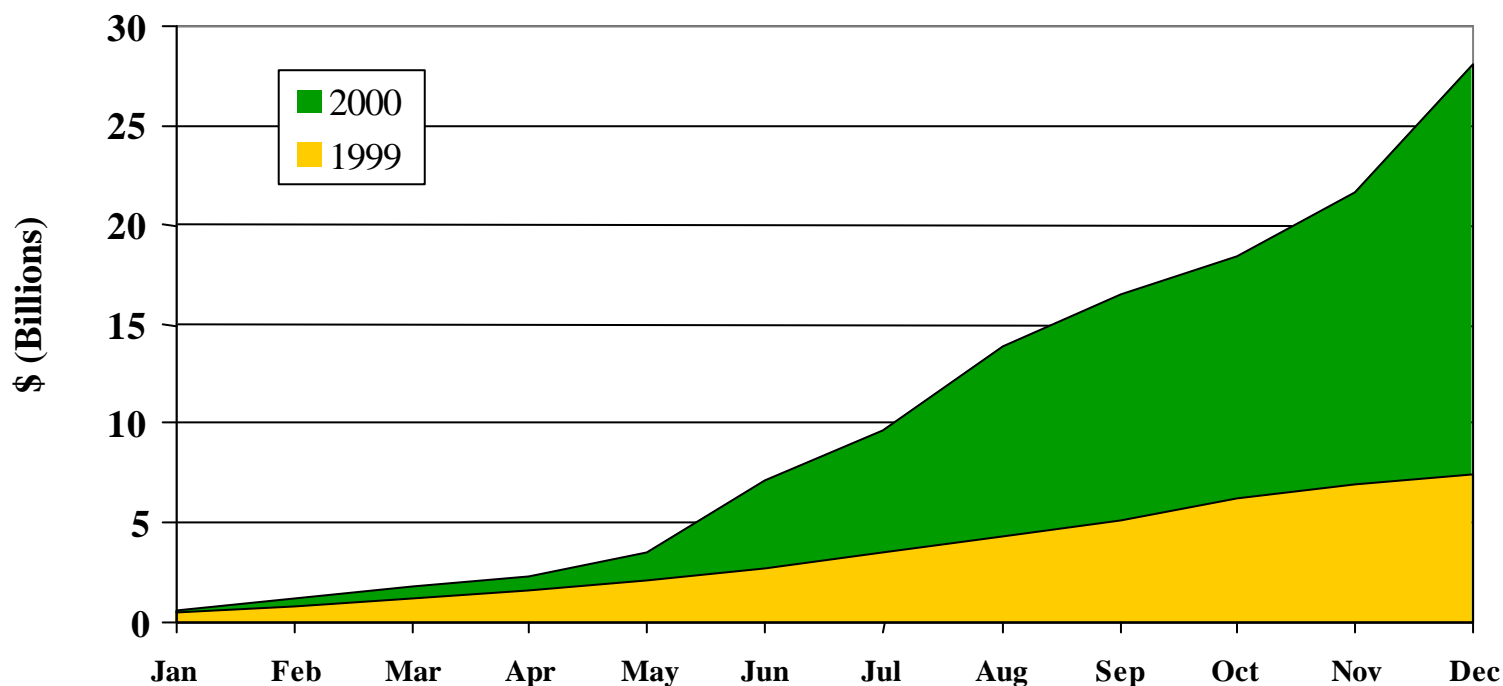
■ Actual prices for last six months of 2000 averaged more than **four times** 1998 and 1999 prices

*Simple average of all hourly prices within the month



Cumulative Cost of California Electricity

1999 and 2000 Cost of Electricity



- Estimated annual cumulative cost to serve all load in the CA ISO's control area
 - Cost includes energy and ancillary services

Source: ISO Board material, January, 2001



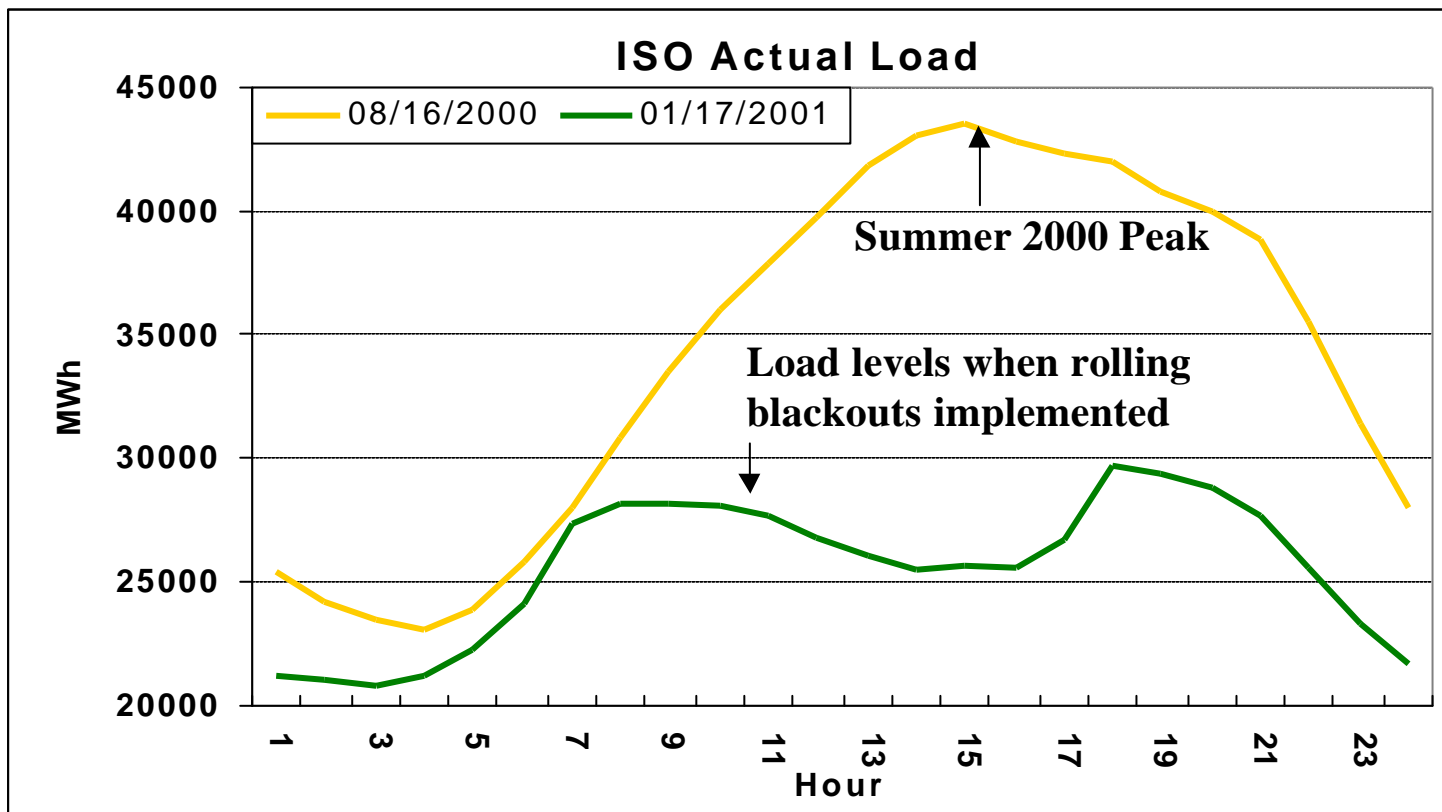
ISO Emergency Operations

	Occurrences			
	Summer 1999	Summer 2000	Nov/Dec 2000	Jan/Feb 2001
■ Stage 1 Emergency	3	32	11	40
» Operating reserve below 7%				
■ Stage 2 Emergency	1	17	9	40
» Operating reserves below 5%				
» Interruption of voluntary customers				
■ Stage 3 Emergency	0	0	1	38
» Operating reserves below 1.5%				
» Possible involuntary interruptions (rolling blackouts)				
■ Involuntary Rolling Blackouts	0	0	0	2

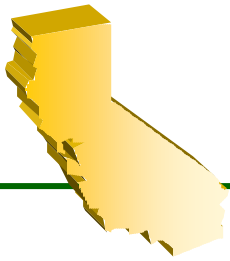
– Rolling blackouts were initiated on 1/17, 1/18



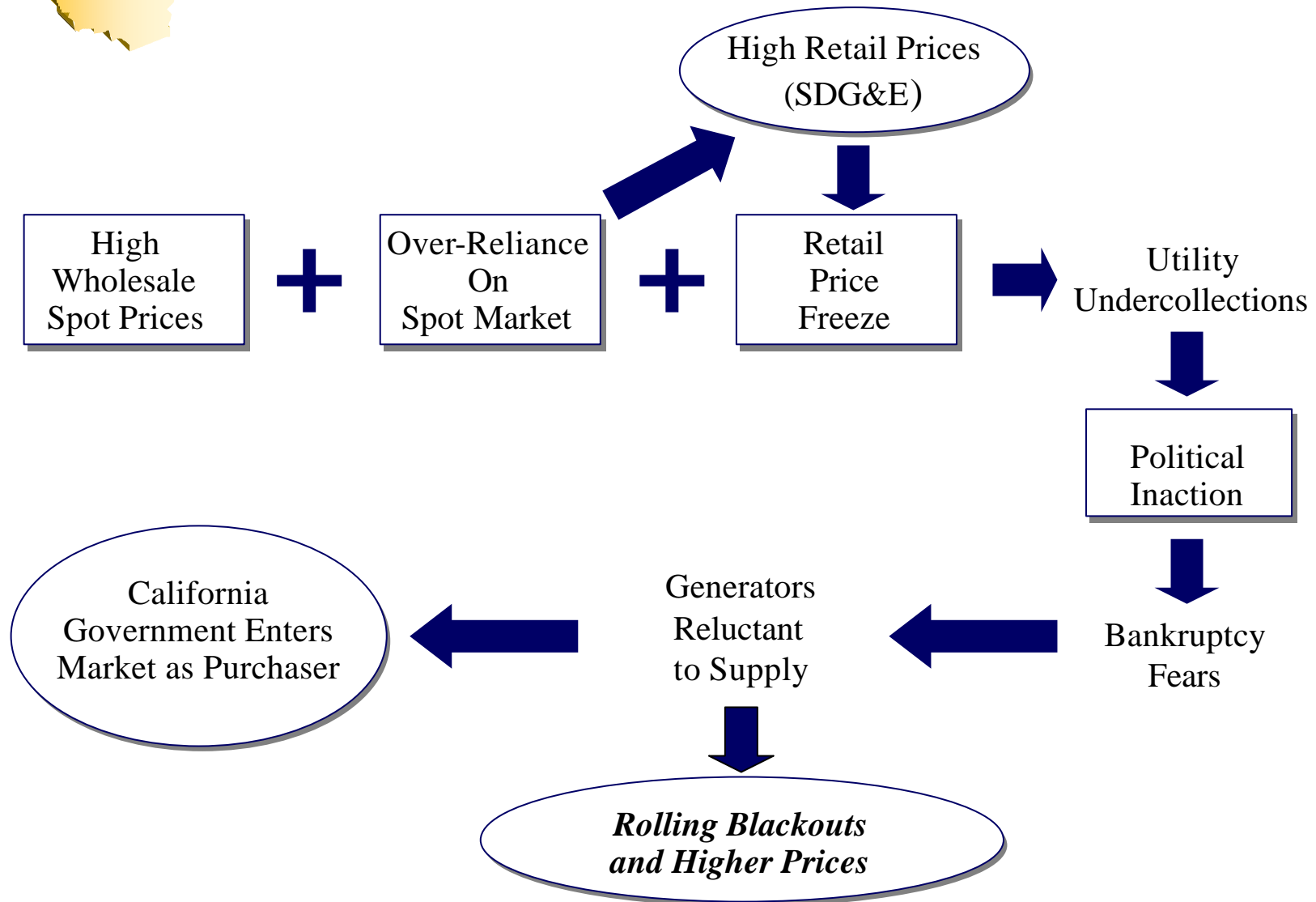
How Can Rolling Blackouts Be Needed in Winter?



- This winter, the ISO initiated rolling blackouts at a demand of only 65% of last summer's peak



Anatomy of a Rolling Disaster



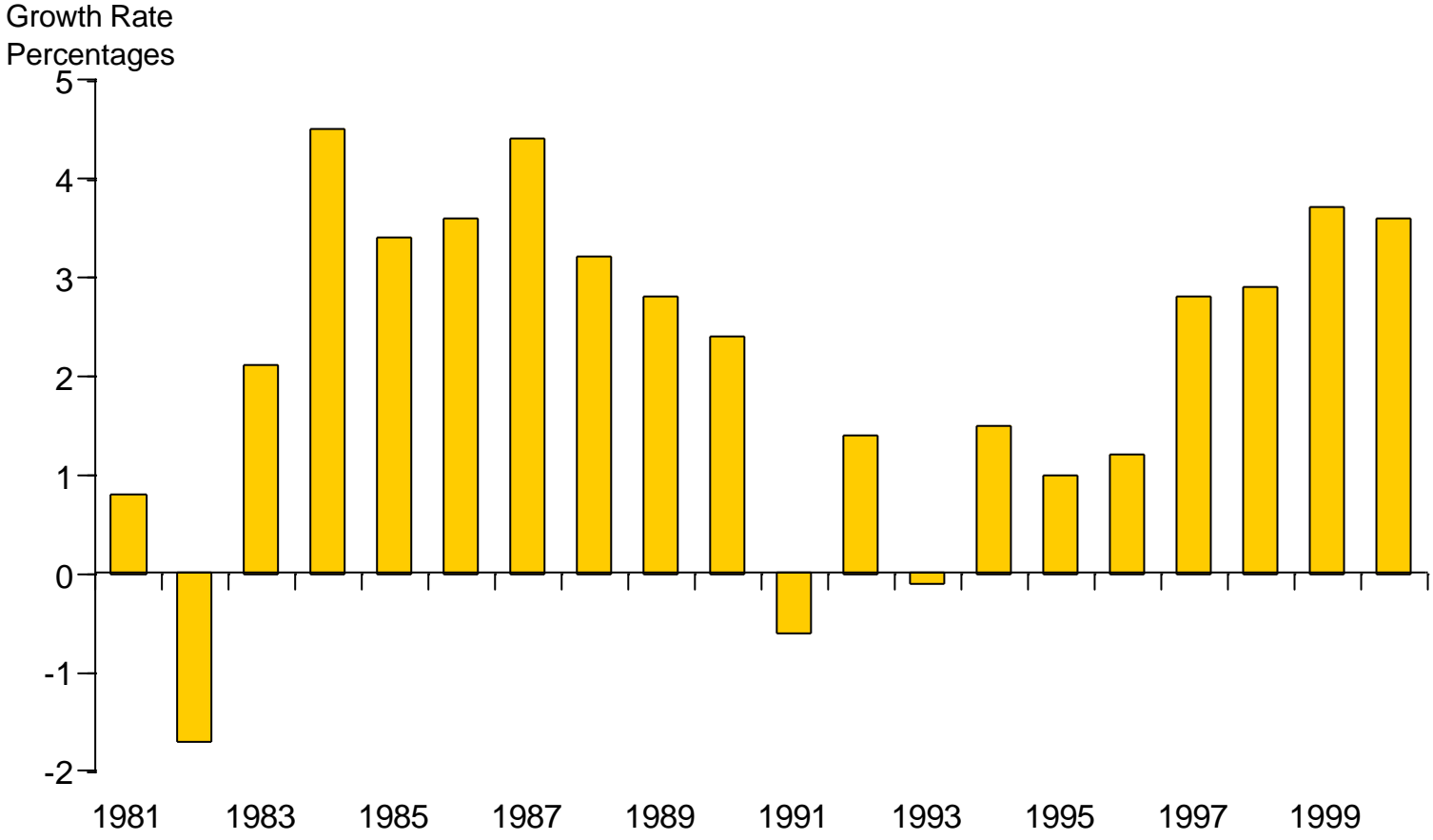


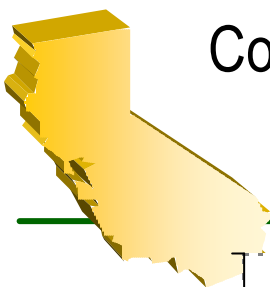
High Wholesale Prices: Market Fundamentals

- High rate of demand growth
- Virtually no new plants sited
- Reduced availability of imports
- Skyrocketing gas prices
 - Pipeline capacity shortages
- Air emissions limitations and high priced emission credits

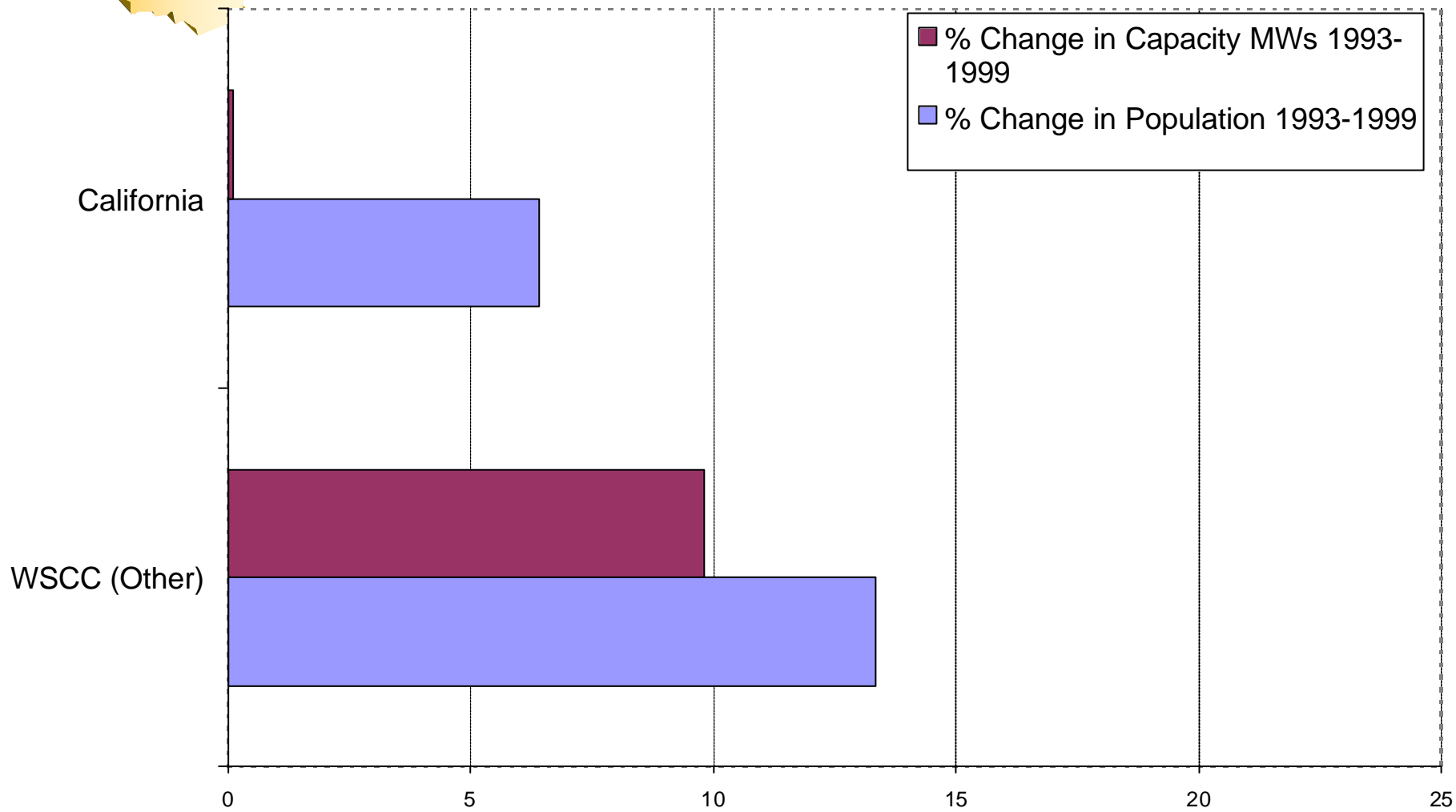


SCE Sales Growth Rates (Weather Adjusted)



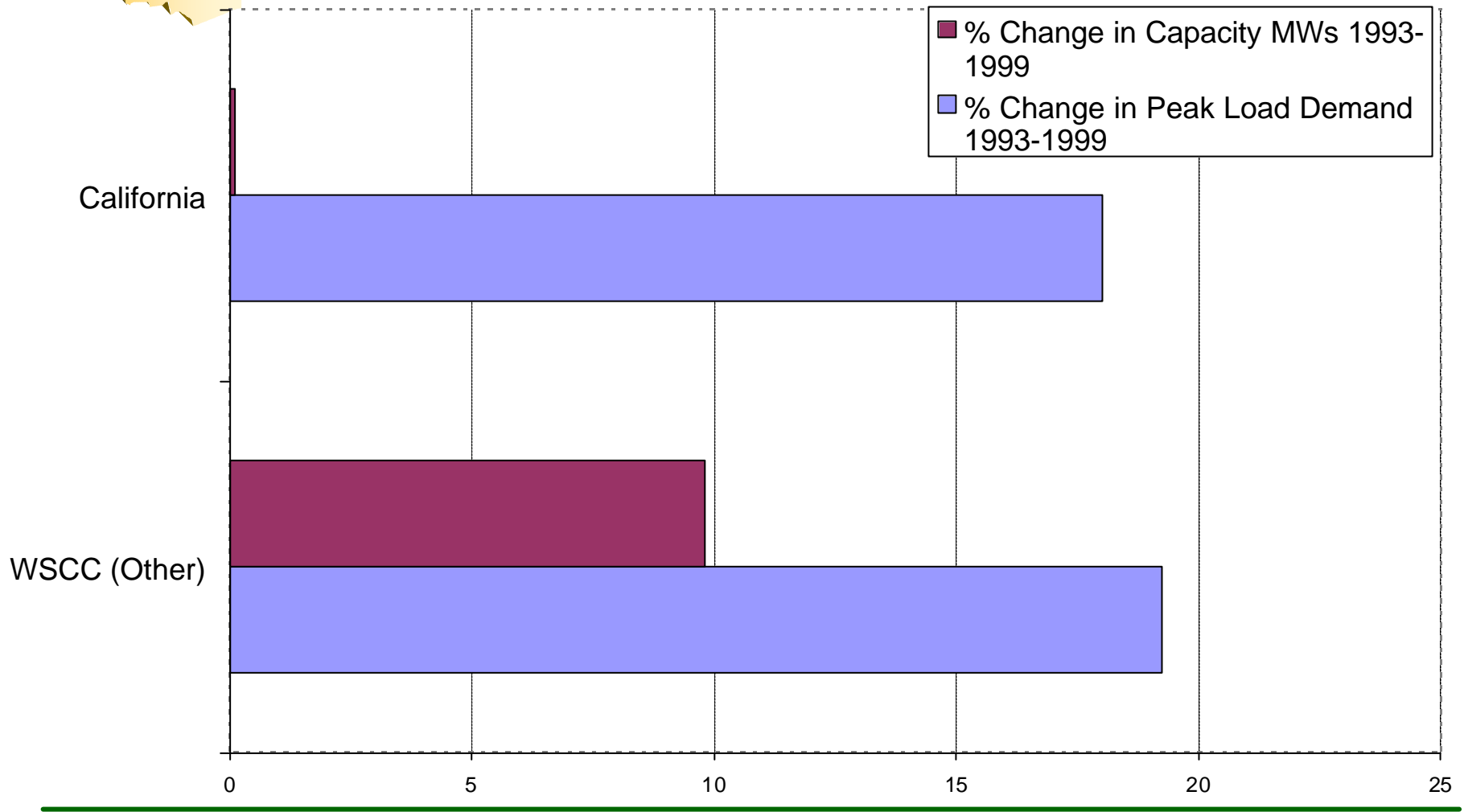


Comparing Growth in Electricity Capacity and Population in California vs. Other WSCC States 1993-1999



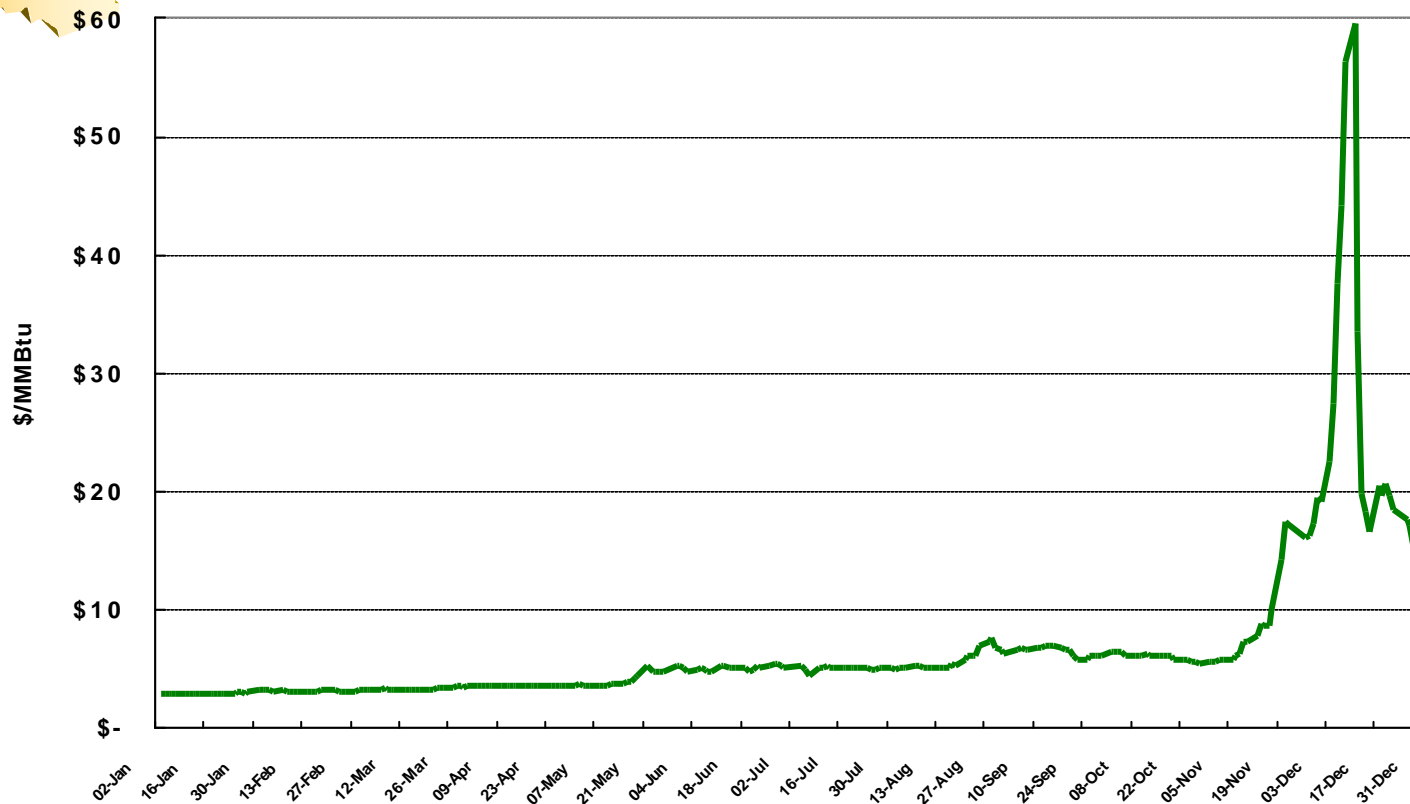


Comparing Growth in Electricity Capacity and Peak Load Demand in California vs. Other WSCC States 1993-1999





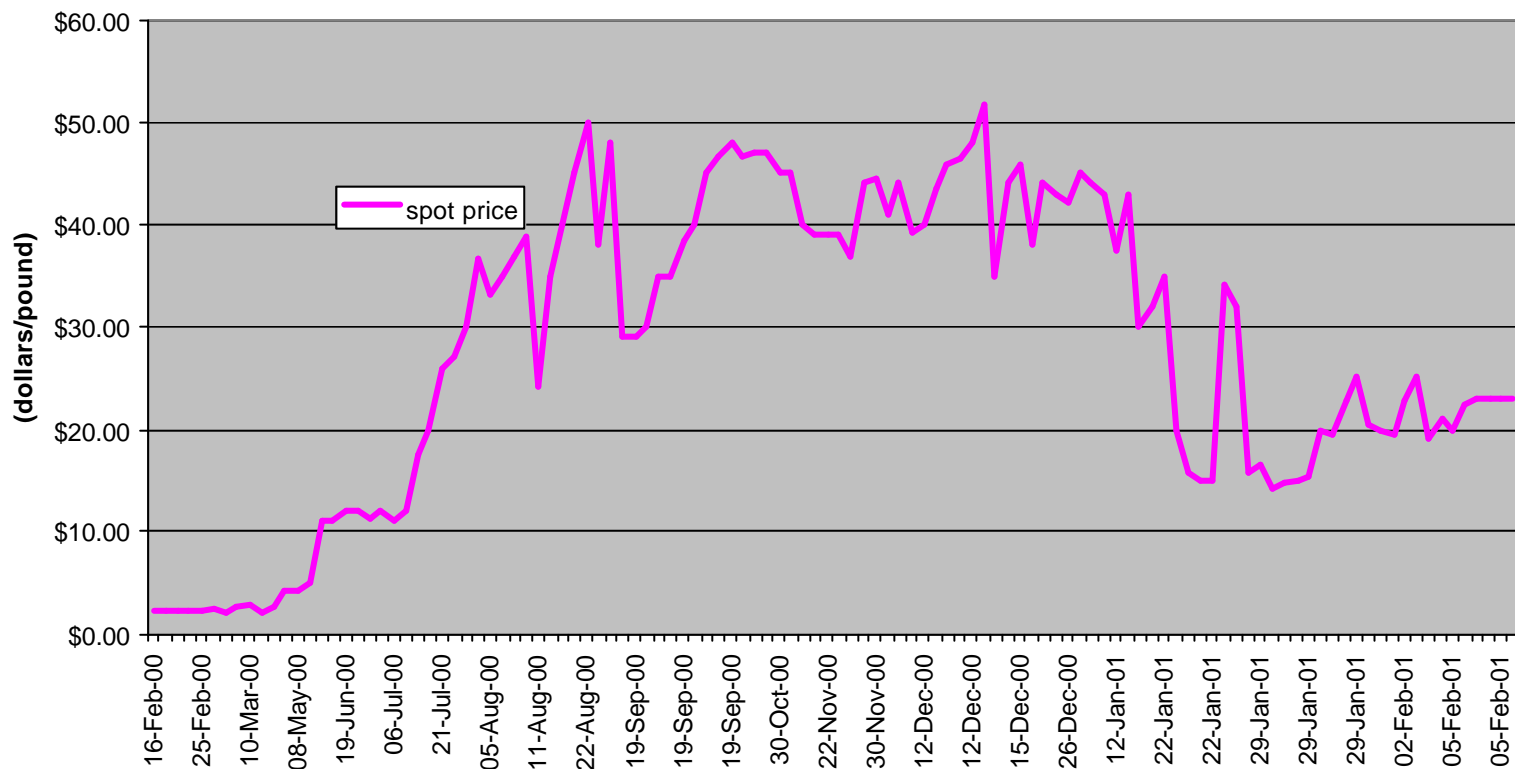
Natural Gas Prices in 2000




- Prices peak at an unheard level of \$60/MMBtu
- Gas prices for the second half of 2000 were more than four times higher than 1998 and 1999 prices



Emissions Credit Prices in Los Angeles Area





High Wholesale Prices: Market Structure, Rules, and Conduct

- Complex ISO/PX market protocols
- Large amount of unhedged power purchases
- Underdeveloped demand-side responsiveness
- Question of market power or shortage-induced high prices

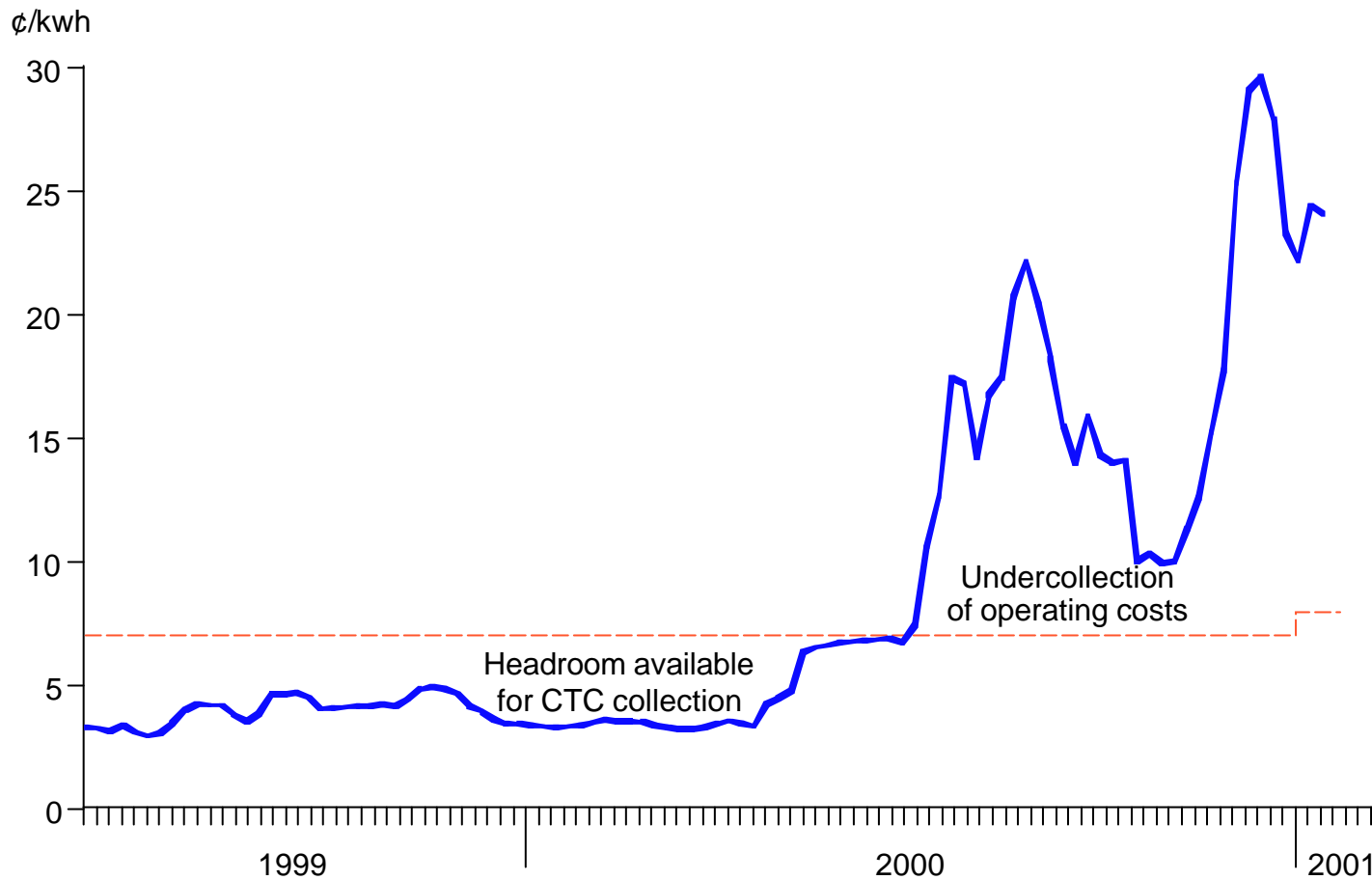
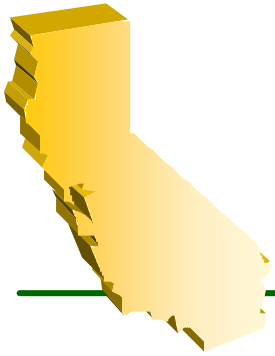


Comparison of Forward Contracting/Hedging in Other Electricity Markets

Regulatory Constraints in Forward Contracting in CAISO Market
Was a Key Source of High Costs in Summer 2000

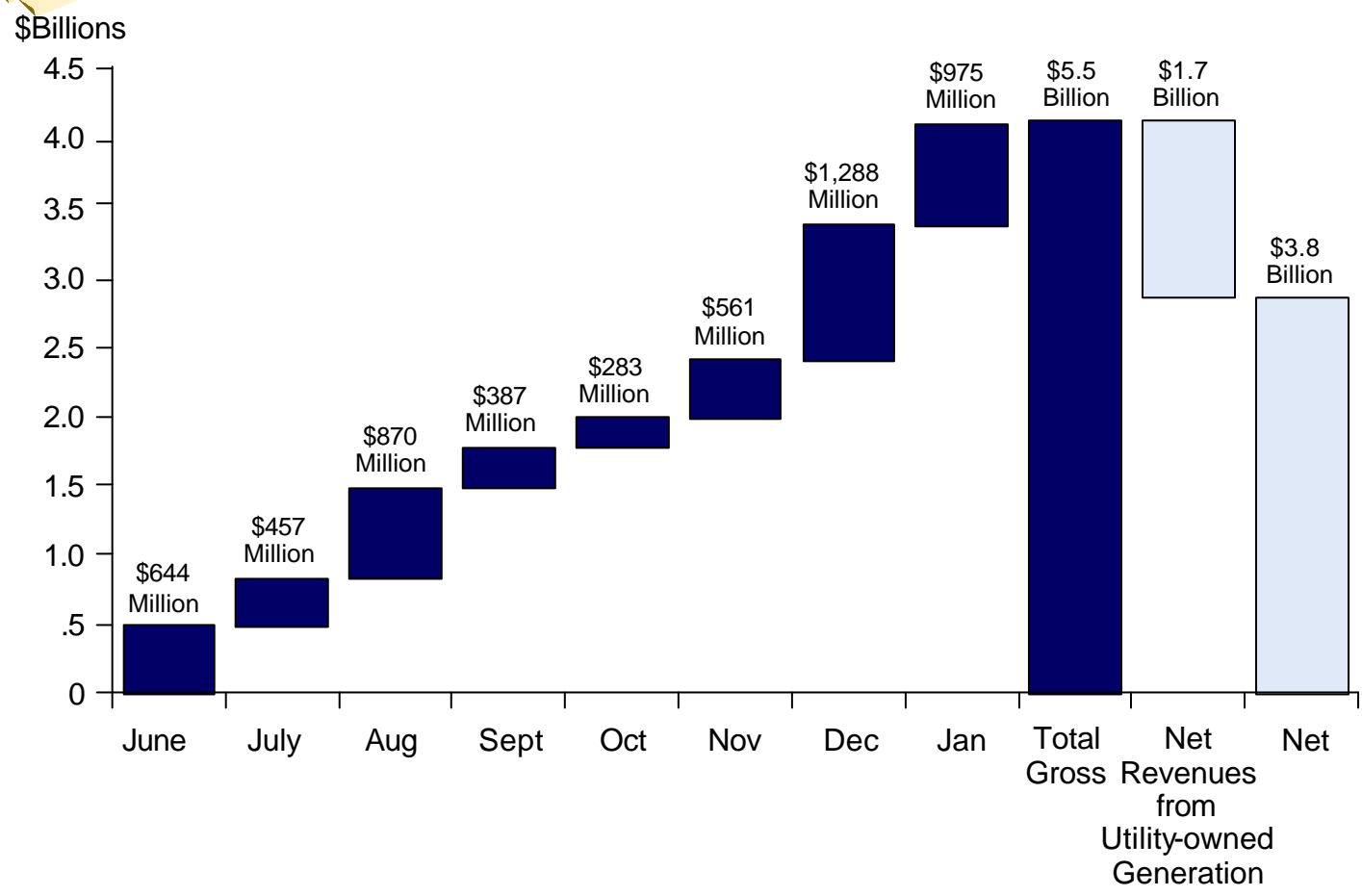
	% Market Hedged (long-term forward contracts, self-owned generation)	Unhedged Spot Market
CAISO	40-50%	50-60%
PJM	85-90%	10-15%
New England	80%	20%
Australia	90%	10%

Utility Undercollections: Wholesale Average Electricity Prices as Flowed Through to SCE Customers in Monthly Billing Cycles





Procurement Undercollections (SCE)





Regulatory and Political Inaction

- FERC's blamed California for creating a flawed structure
- Californian Governor blamed FERC for not setting tighter controls on wholesale prices
- CPUC's inaction in approving long-term contracts and setting reasonableness standards
- CPUC's unwillingness to end the retail rate freeze last Fall



California State Government Enters Power Purchasing Business

- On January 17, Governor Davis authorized the California Department of Water Resources (CDWR) to begin purchasing spot and short-term power to avoid rolling blackouts
 - On February 1, Governor Signed Assembly Bill 1X
 - CDWR directed to purchase entire “net short” requirements of utilities
 - Authorizes up to \$10 billion in revenue bonds for long-term power contracts
 - CDWR authorized to enter into contracts until 1/2/3003
 - CDWR now spending \$40-50 million per day on near-term power purchases; \$3 billion spent so far
 - Governor recently announced the signing of 40 long-term contracts totaling 8900 MWs
-



Governor Davis' Announced Utility Recovery Plan

- State purchase of transmission grid at fair value
 - Amount in excess of book used to pay down utility undercollections
- Utility-owned generation will supply power at cost-based rates for ten years
- State receives conservation easements on utility-owned wilderness lands

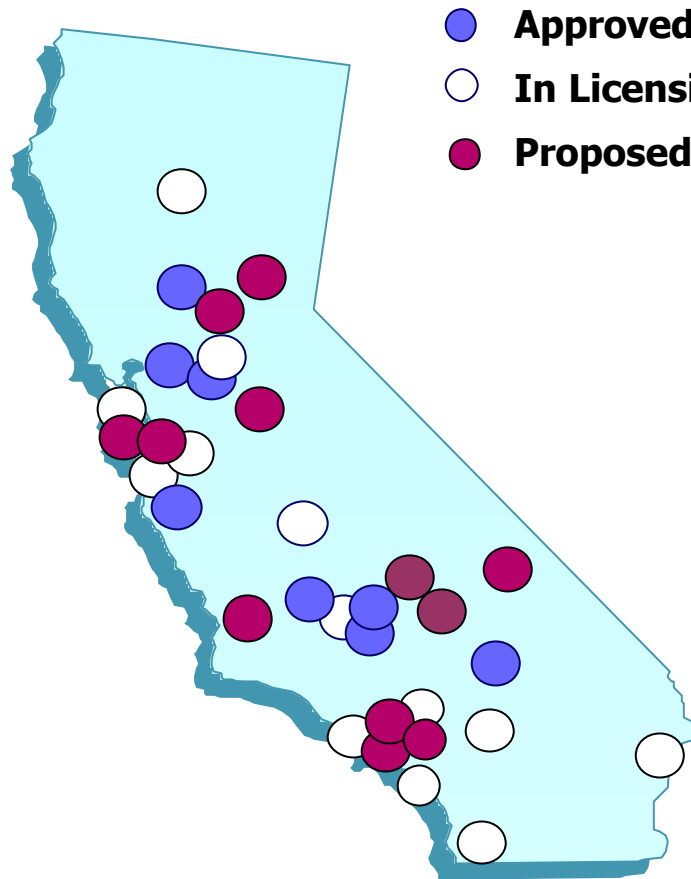


What's Needed in the Near Term?

- Reasonable long-term wholesale contracts
 - FERC enforcement of its “just and reasonable” standard would be helpful
- Reasonable retail price increases
- Assurance of recovery of past and future procurement undercollections
- Very serious statewide (and West-wide) conservation program
 - Governor’s objective is 5,000 MW in Summer 2001
- Continue to foster development of new generation
 - Governor’s objective is 5,000 MW by Summer 2001

Is There Long-Term Relief ? New Generation In California

California 2001-2004



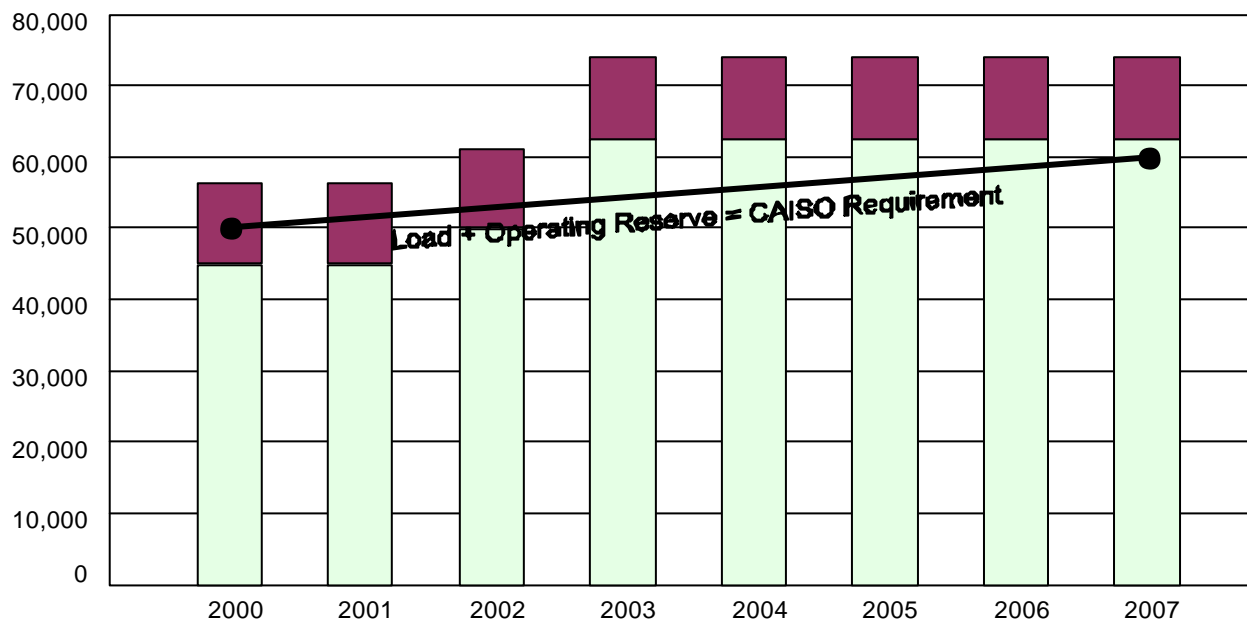
● Approved/Under Construction	6,273 MW
○ In Licensing	7,716 MW
● Proposed	<u>5,780 MW</u>
Total	19,769 MW

Generation Scheduled for Summer 2001

<i>Project</i>	<i>Date</i>	<i>MW</i>
<i>California</i>		
<i>Sutter</i>	<i>8/1</i>	<i>500</i>
<i>Los Medanos</i>	<i>7/1</i>	<i>500</i>
<i>Various</i>	<i>6/1 - 9/1</i>	<i>1,070</i>
<i>California Total</i>		<i>2,070</i>
<i>Southwest</i>	<i>6/1 - 7/1</i>	<i>1,690</i>
<i>Northwest</i>	<i>7/1</i>	<i>500</i>
<i>Summer 2001 Total</i>		<i>4,260</i>



California ISO Load/Resource Forecast



■	Max Import Capacity	11,260	11,260	11,260	11,260	11,260	11,260	11,260	11,260
□	Max Avail. Gen. Capacity	45,565	45,602	50,011	62,861	62,878	62,861	63,190	63,180
	Load Forecast + OR	49,209	50,188	51,463	53,602	54,462	55,306	56,177	57,928

Source: California Independent Operator



Lessons Learned

- Regulatory vision must be internally consistent - Mixture of regulated retail prices and unregulated wholesale prices was an especially inconsistent and dangerous combination in California.
 - Policies need to respond to unforeseen and unintended consequences
 - Absence of clear policy accountability creates a slowness or inability to respond to evolving problems - The “blame game” doesn’t solve problems
 - Uncertainty deters investors - key generation investments in late 1990’s were delayed due to policy uncertainty
 - Market realities cannot be sidestepped - policy design should harness rather than ignore these forces
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