Why Is Electric Competition Proving So Expensive?

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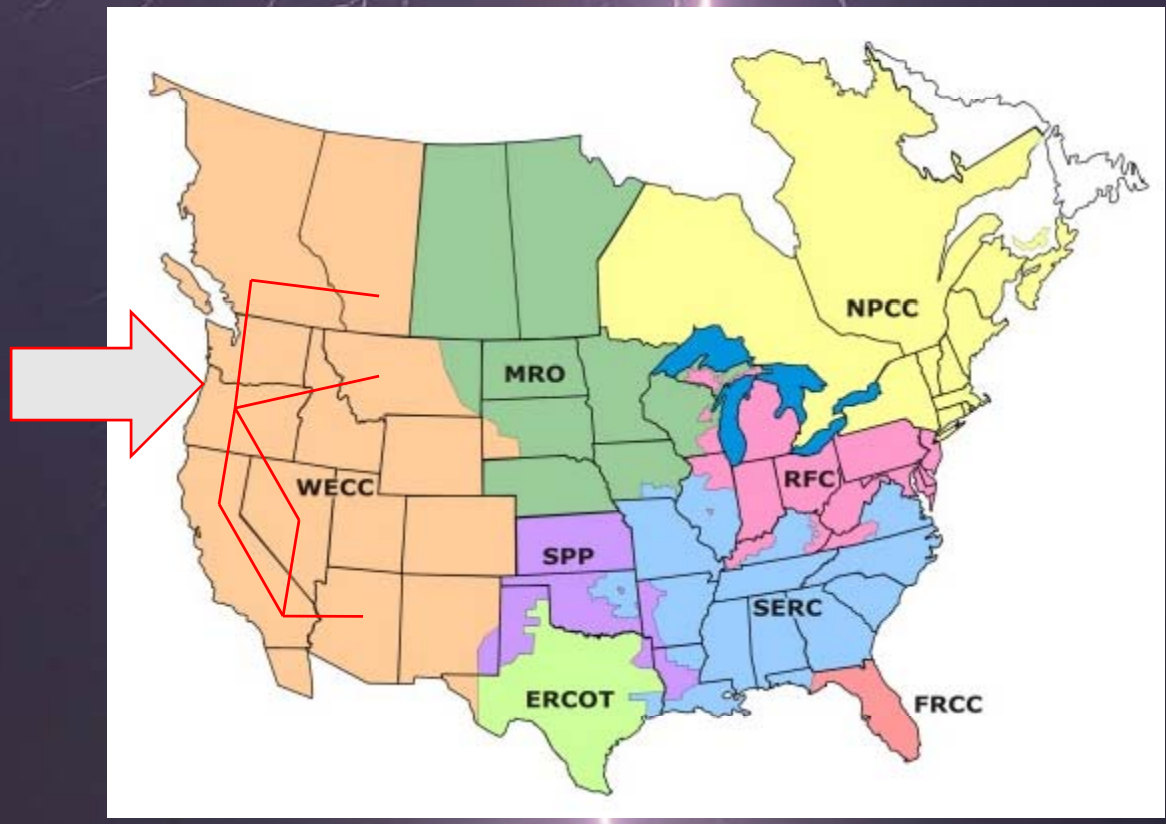
May 23, 2007


Things to come . . .
• Where are we?
• How did we get here?
• The onset of competition in wholesale markets
• California rejects the WSPP and embraces the English model
• How have we done since?
• Why are things working so poorly?

Where are we?

- We are the hub of the western half of the WECC
- Our location is not random – we are the child of Franklin Delano Roosevelt and J.D. Ross
- We enjoy the most open market in the U.S. and Canada

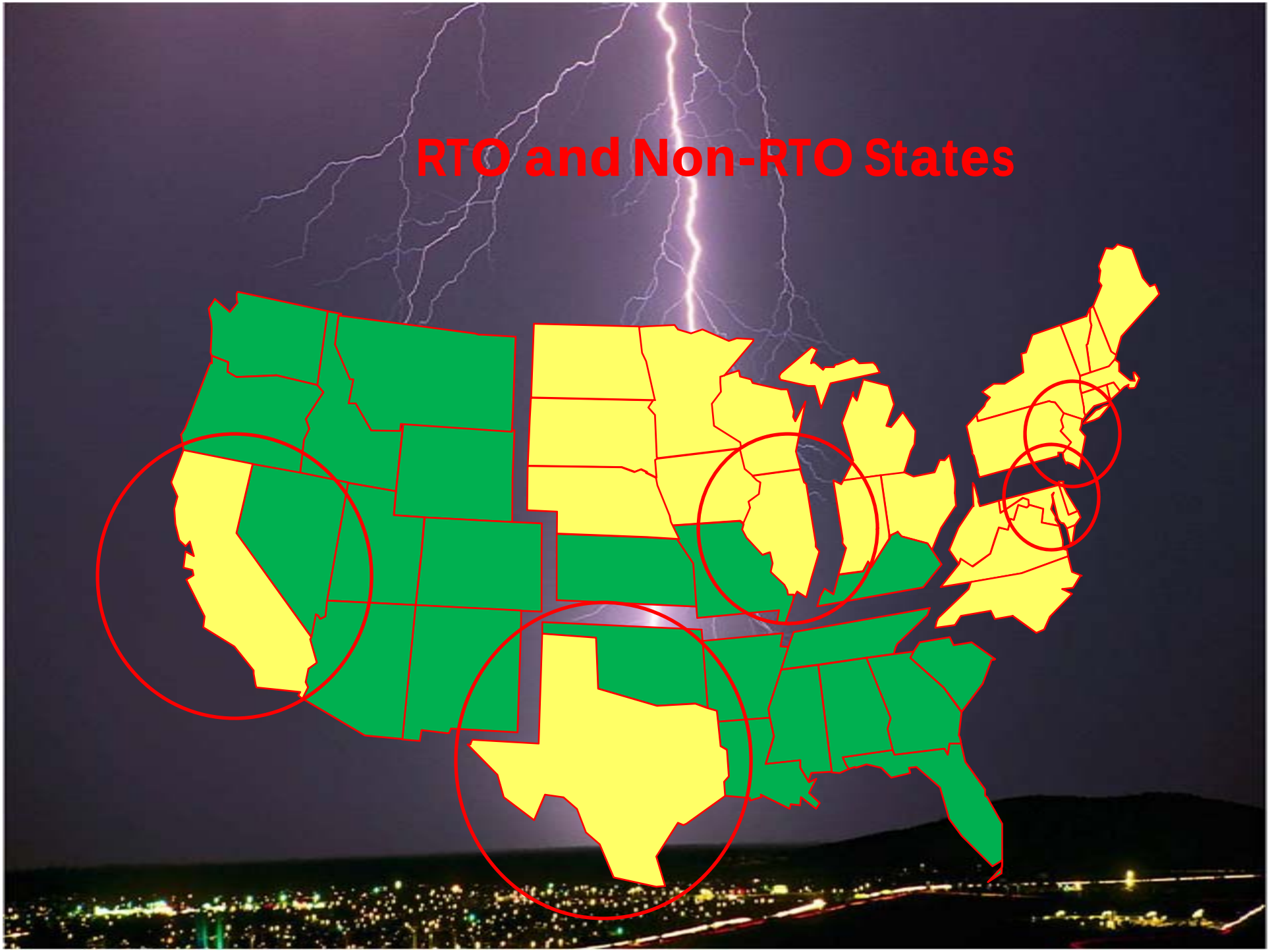
You are here:



Terminology

- RTO – Regional Transmission Organization – also known as an Independent System Operator or ISO.
- Heat Rate: Rate of transformation from natural gas to electricity. Usually reported in the number of btu required to make a kilowatt-hour.
- Administered markets – markets where stylized market rules are administered by a central authority

RTO and Non-RTO States



Recent Events

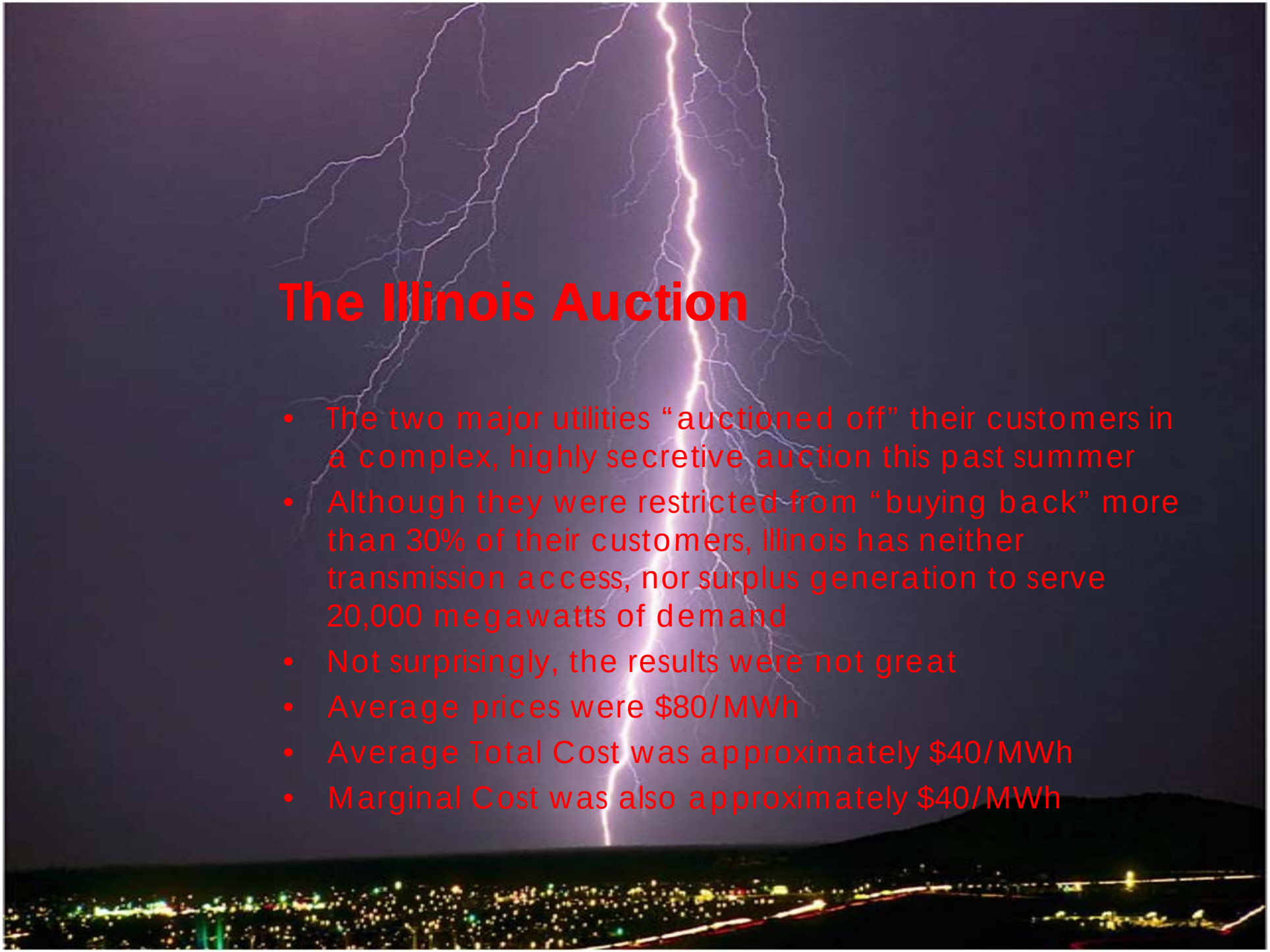
- Texas price increases outstrip fuel costs – high levels of concentration and pivotal bidder behavior
- Default bidder auctions in Illinois (40% over non-auction prices)
- Default bidder auctions in New Jersey and Maryland (20% over non-auction prices)

Competition Where?

- BPA proposed selling its short term supplies on the open market
- PGE implemented these supplies as economic development supplies to local industry
- A robust wholesale market soon spanned the west coast
- Major industries gained the right to access the market under a family of subterfuges
- By the late 1990s most major Pacific Northwest industry enjoyed market pricing in some fashion
- Thermal plant availability increased from 80% to 92%

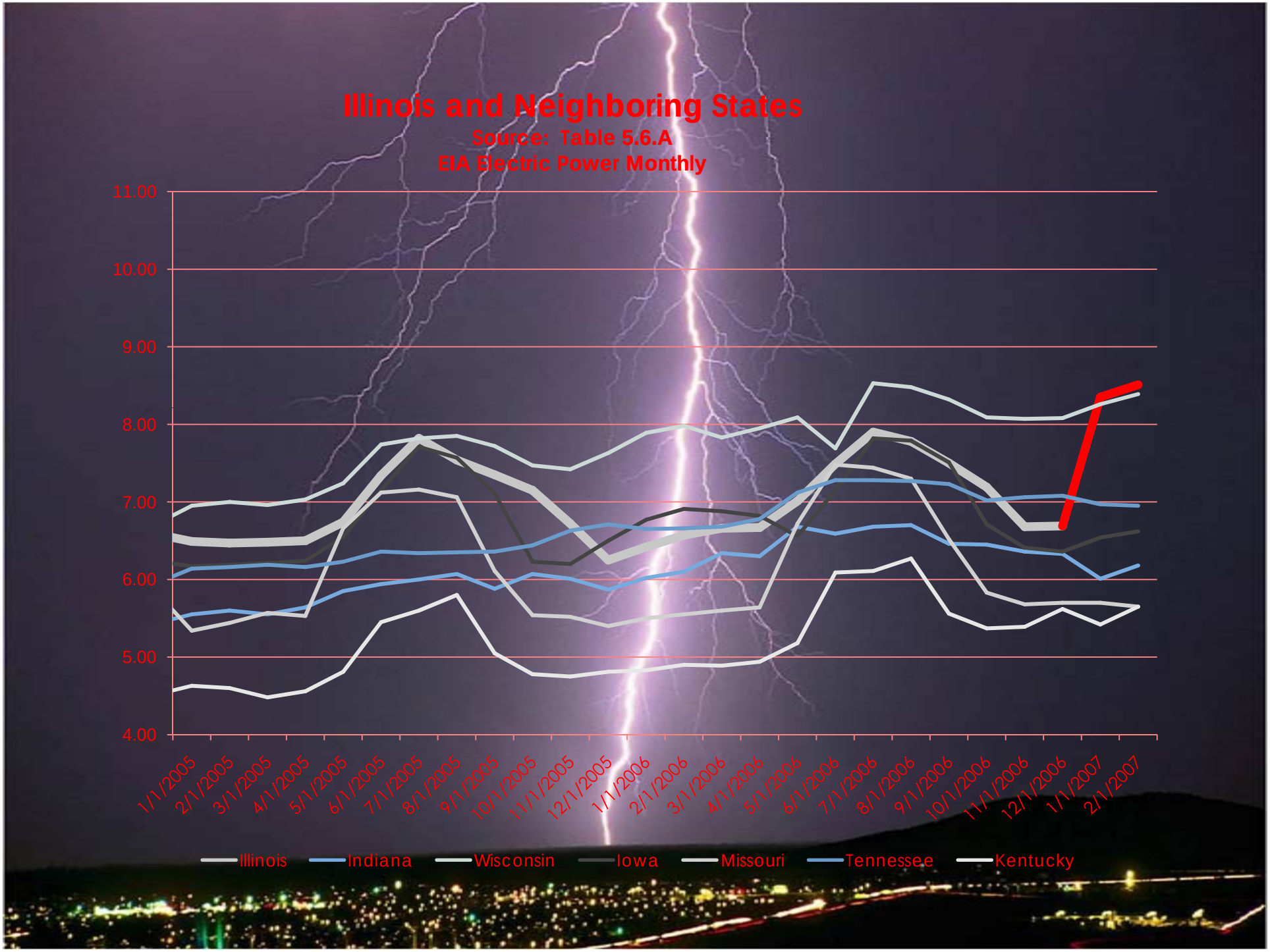
California Rejects Free Markets

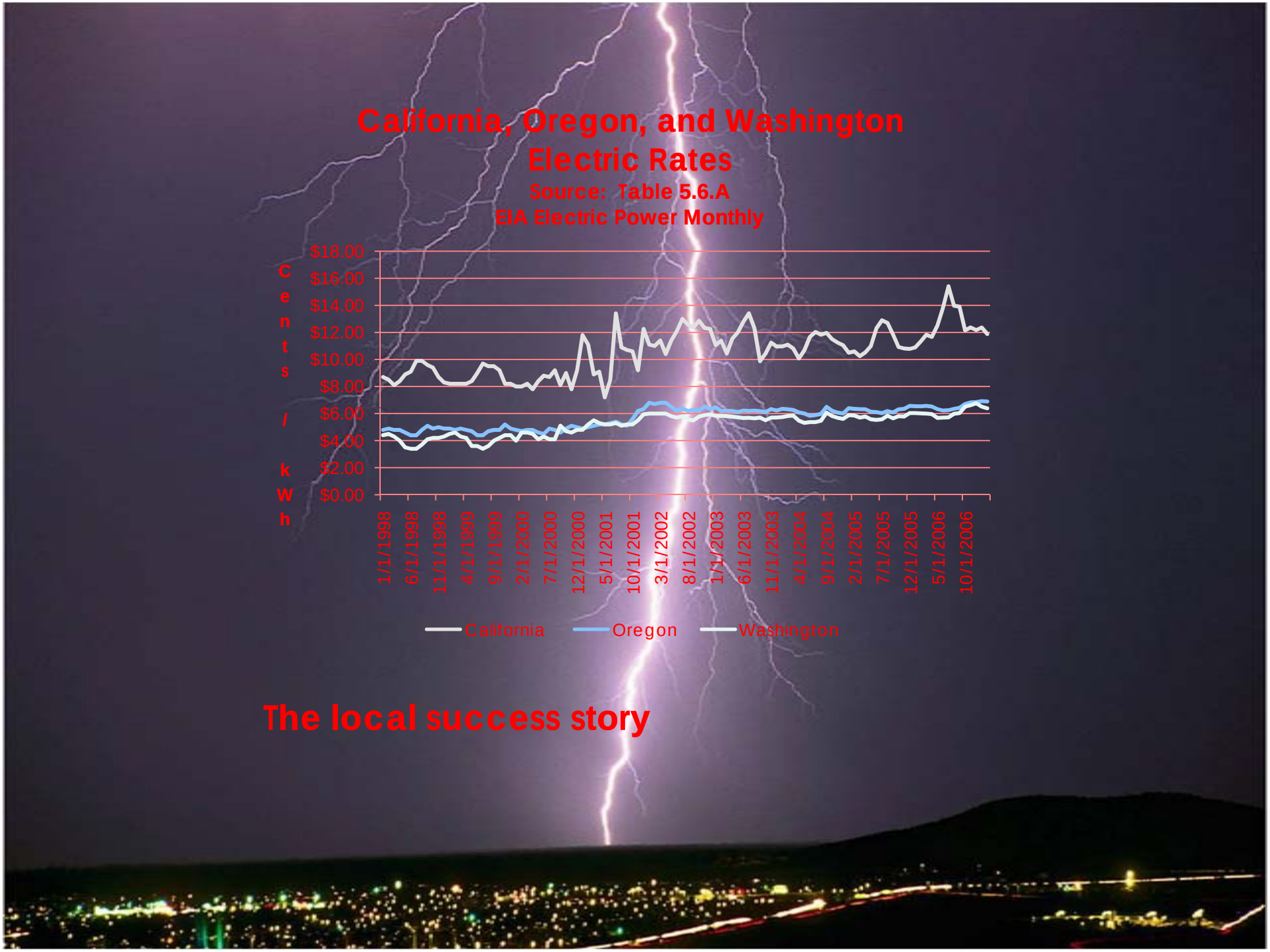
- After a prolonged review in the mid-1990s, California authorities reject open markets in favor of the administered British approach
- Let a hundred regulators intervene, make a hundred markets opaque
- California's markets were, in the words of the convicted felon, Tim Belden, "prone to gaming"
- California's model has been adopted by half of the U.S. and Canada

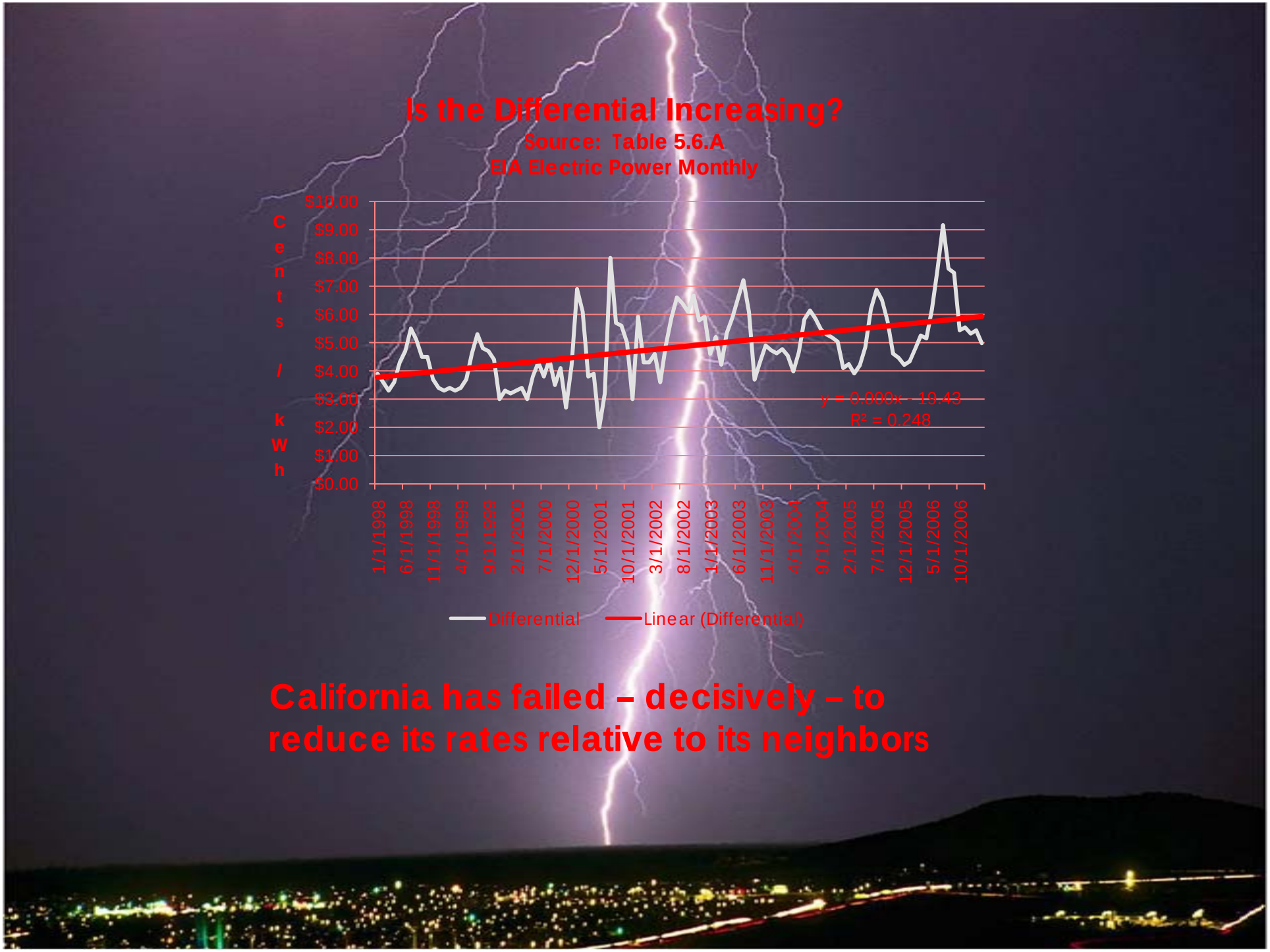


The Illinois Auction

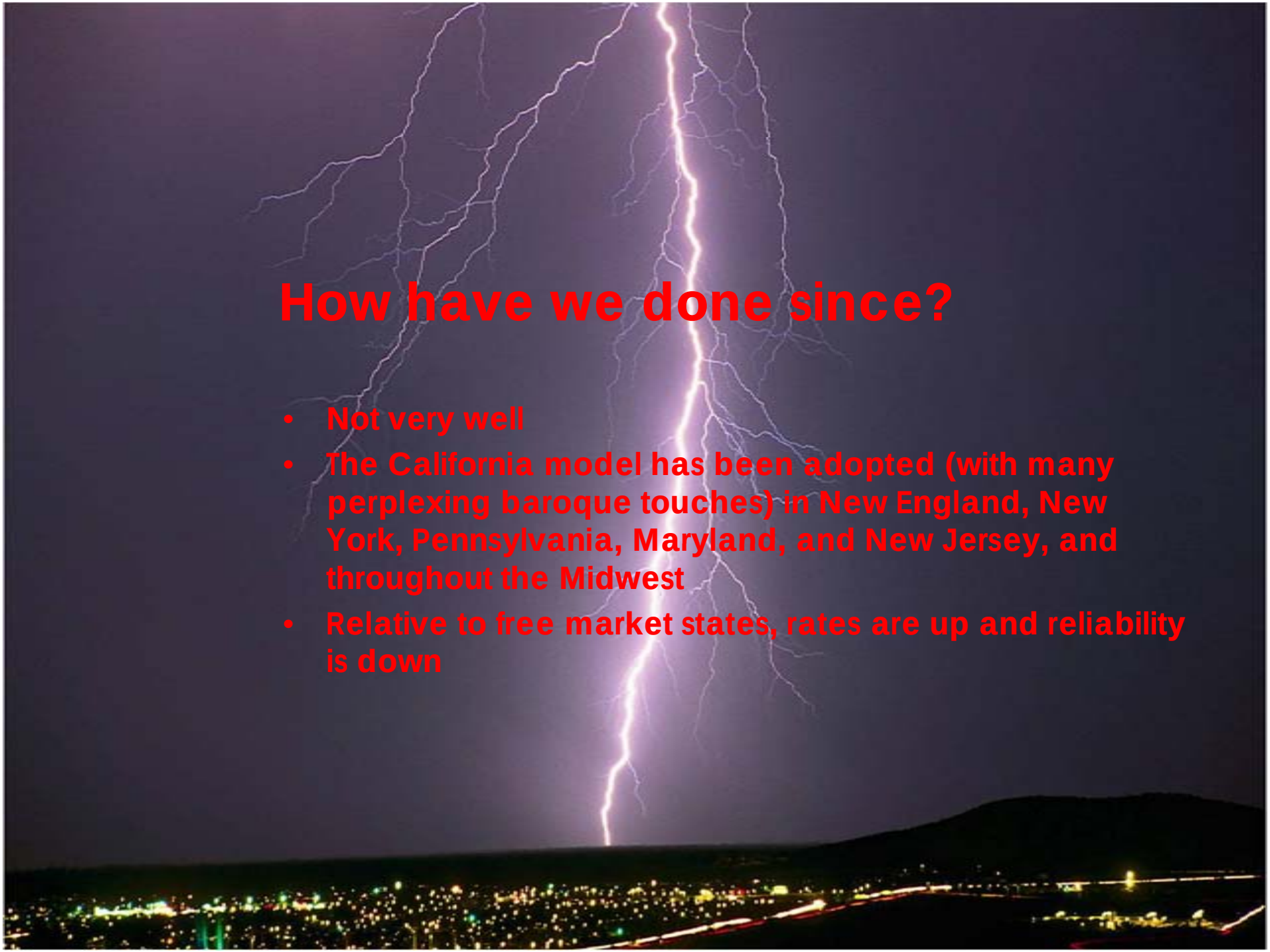
- The two major utilities "auctioned off" their customers in a complex, highly secretive auction this past summer
- Although they were restricted from "buying back" more than 30% of their customers, Illinois has neither transmission access, nor surplus generation to serve 20,000 megawatts of demand
- Not surprisingly, the results were not great
- Average prices were $80/MWh
- Average Total Cost was approximately $40/MWh
- Marginal Cost was also approximately $40/MWh


Illinois and Neighboring States
Source: Table 5.6.A
EIA Electric Power Monthly
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
1/1/2005
2/1/2005
3/1/2005
4/1/2005
5/1/2005
6/1/2005
7/1/2005
8/1/2005
9/1/2005
10/1/2005
11/1/2005
12/1/2005
1/1/2006
2/1/2006
3/1/2006
4/1/2006
5/1/2006
6/1/2006
7/1/2006
8/1/2006
9/1/2006
10/1/2006
11/1/2006
12/1/2006
1/1/2007
2/1/2007
Illinois
Indiana
Wisconsin
Iowa
Missouri
Tennessee
Kentucky


California, Oregon, and Washington
Electric Rates
Source: Table 5.6.A
EIA Electric Power Monthly
Cents / kWh
$18.00
$16.00
$14.00
$12.00
$10.00
$8.00
$6.00
$4.00
$2.00
$0.00
1/1/1998
6/1/1998
11/1/1998
4/1/1999
9/1/1999
2/1/2000
7/1/2000
12/1/2000
5/1/2001
10/1/2001
3/1/2002
8/1/2002
1/1/2003
6/1/2003
11/1/2003
4/1/2004
9/1/2004
2/1/2005
7/1/2005
12/1/2005
5/1/2006
10/1/2006
California
Oregon
Washington
The local success story

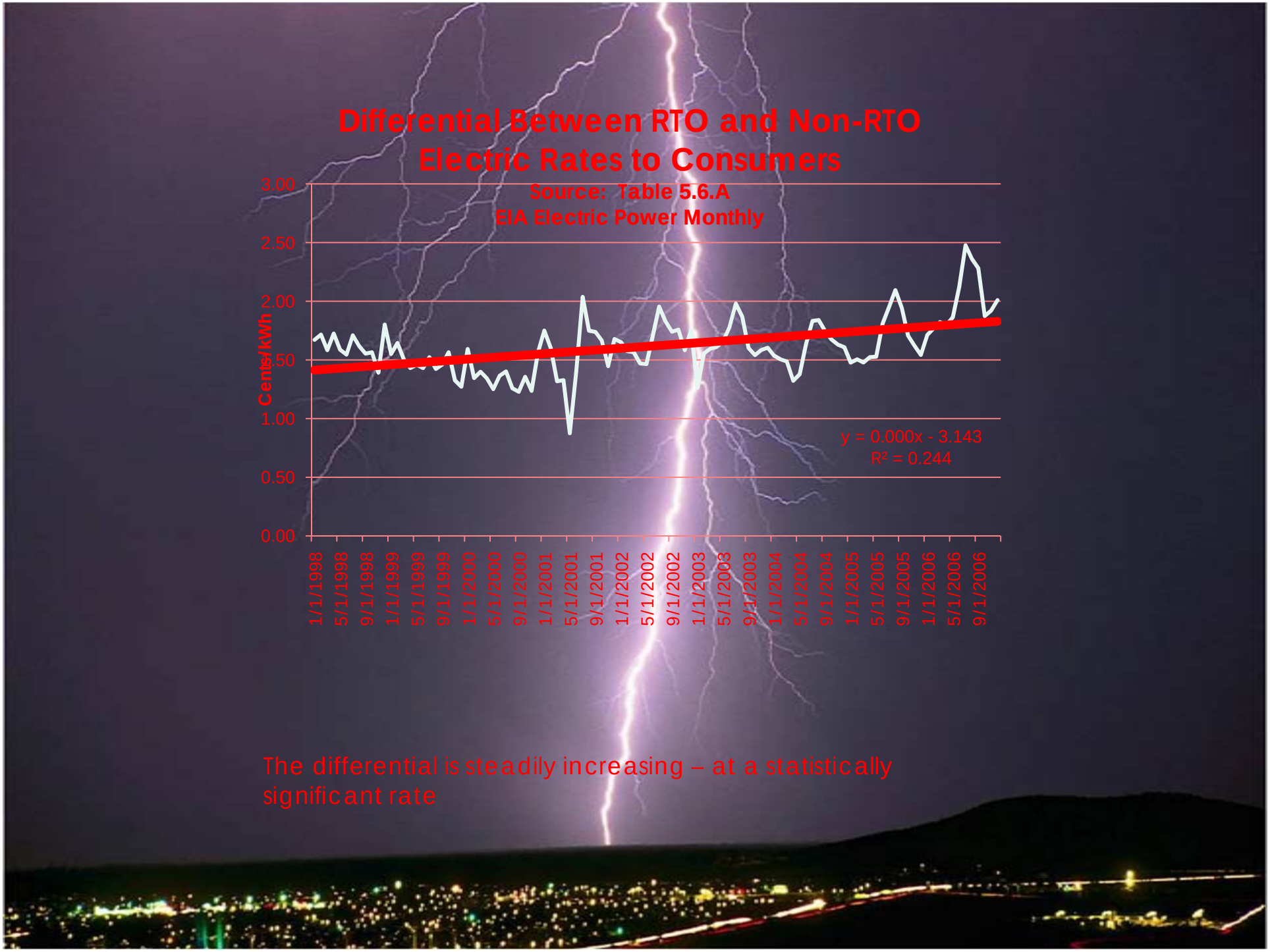


California has failed – decisively – to reduce its rates relative to its neighbors



How have we done since?

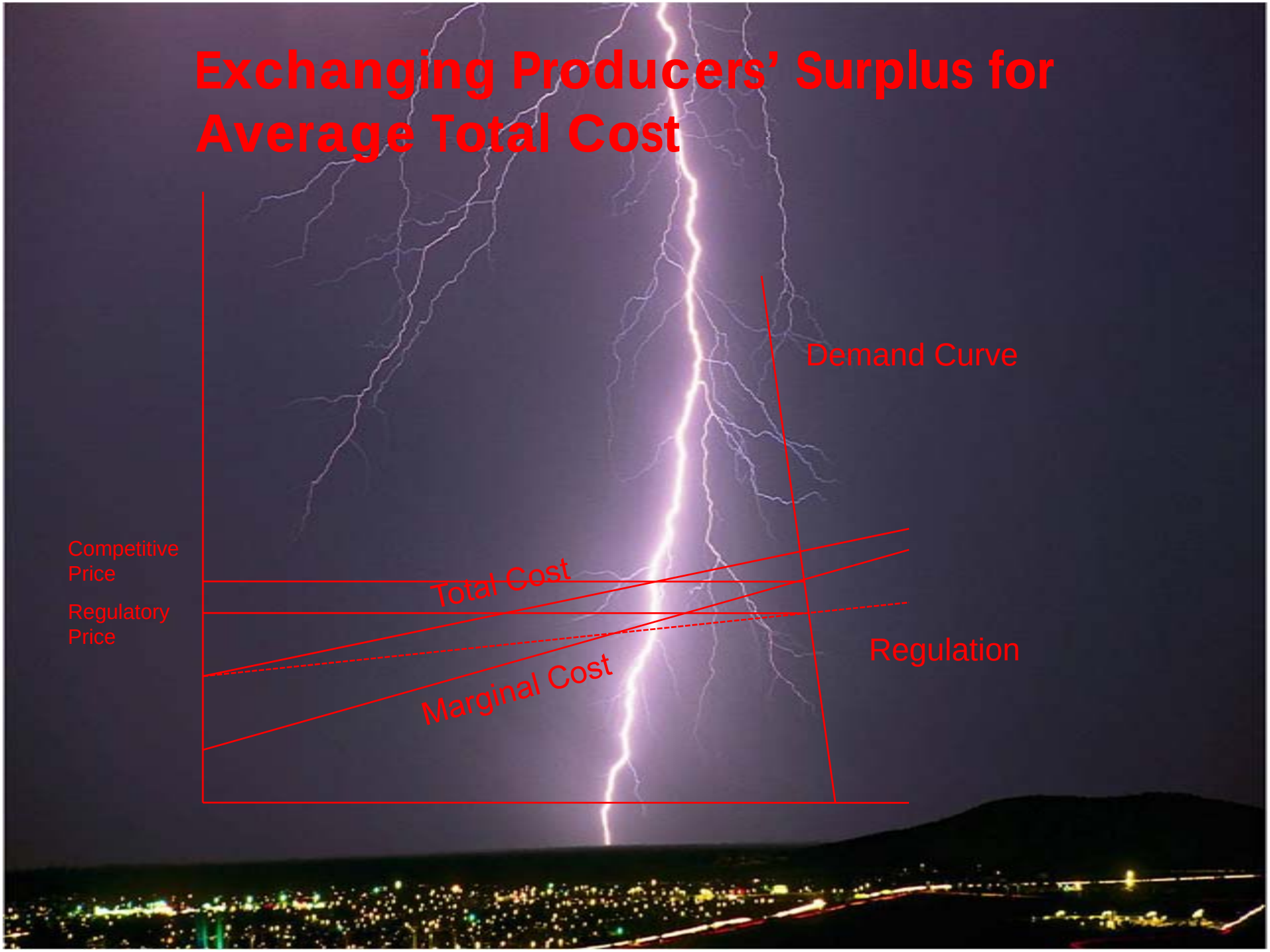
- Not very well
- The California model has been adopted (with many perplexing baroque touches) in New England, New York, Pennsylvania, Maryland, and New Jersey, and throughout the Midwest
- Relative to free market states, rates are up and reliability is down

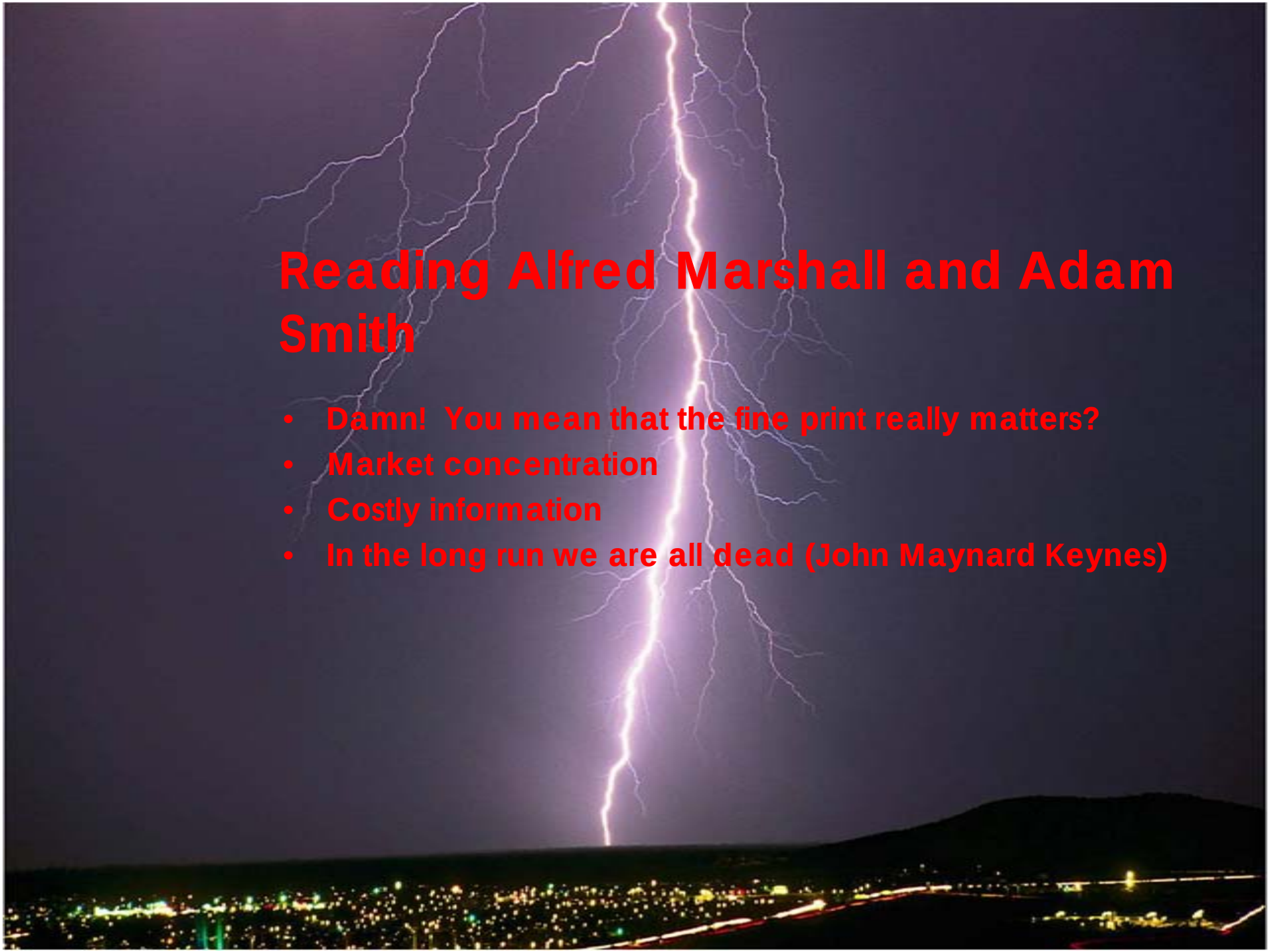


The differential is steadily increasing – at a statistically significant rate


Why?
• Reading Alfred Marshall and Adam Smith
• Fuel Costs
• Producer's Surplus
• Electric Reliability

Exchanging Producers' Surplus for Average Total Cost





Reading Alfred Marshall and Adam Smith

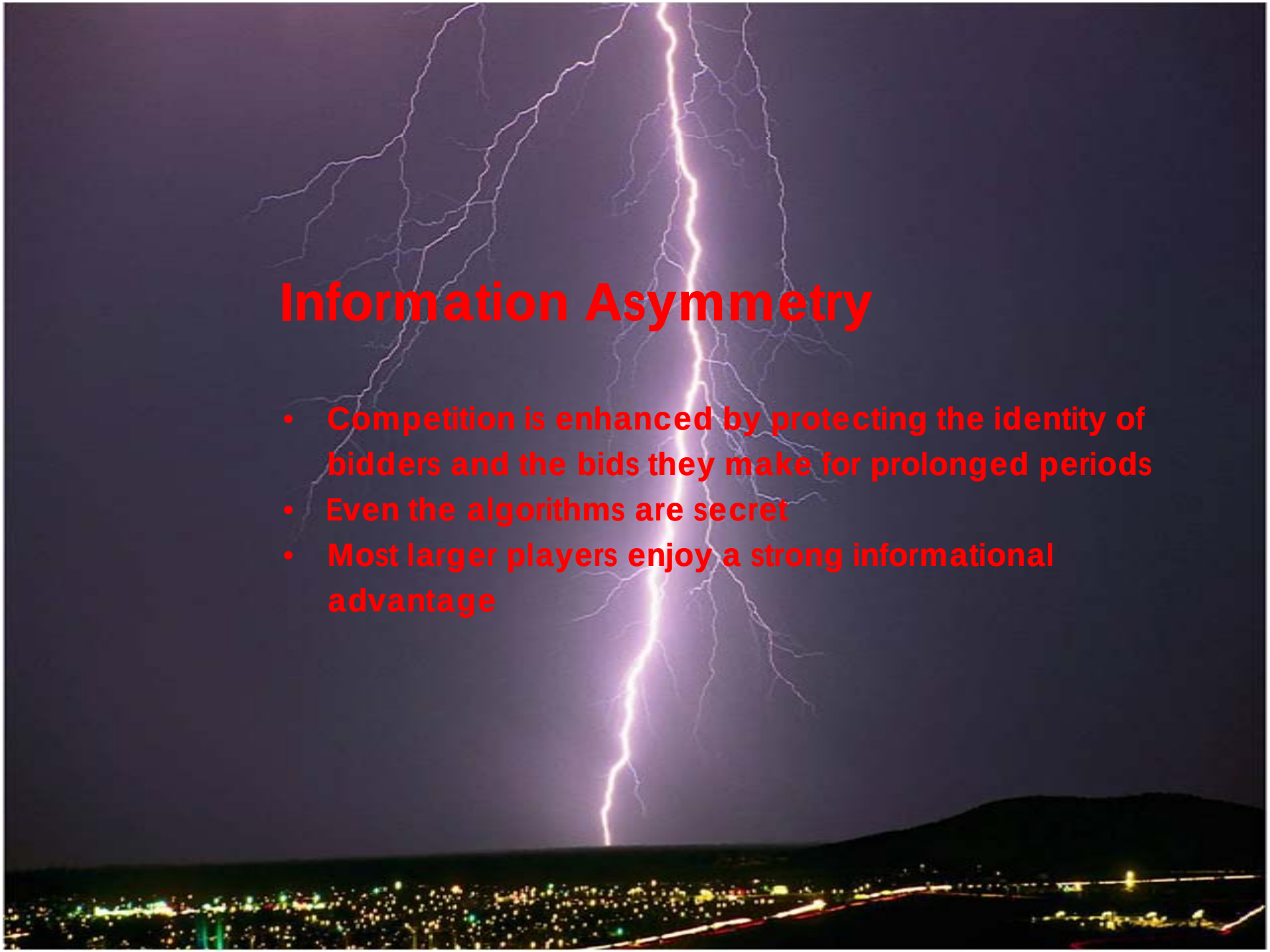
- Damn! You mean that the fine print really matters?
- Market concentration
- Costly information
- In the long run we are all dead (John Maynard Keynes)

Fine Print of Competition

- Freedom of entry and exit
- Numerous buyers and sellers
- No asymmetry of information
- In the long run we are all dead (John Maynard Keynes)

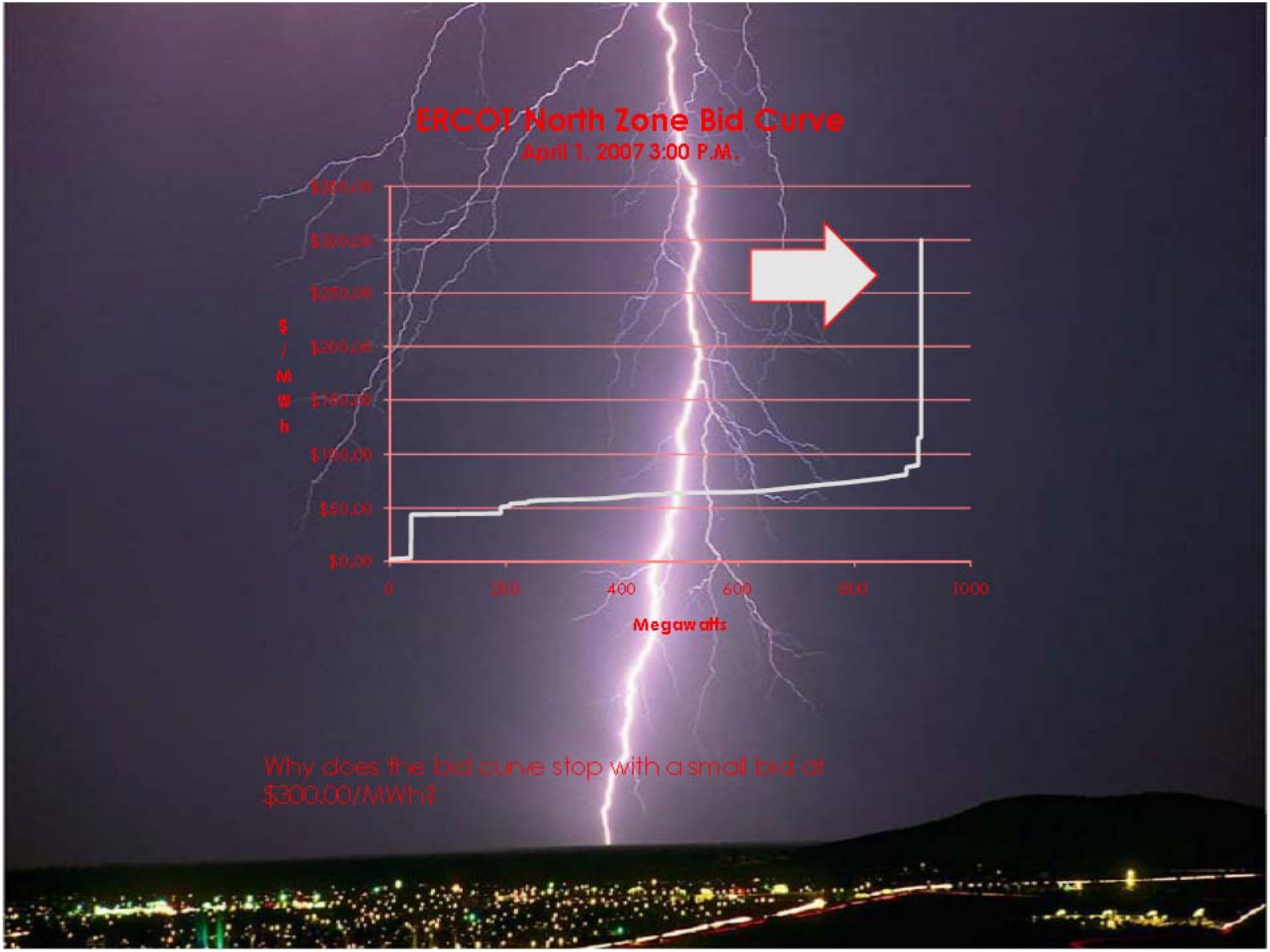
Market Concentration

- By any traditional measure, the RTO markets are highly concentrated.
- In Texas, one supplier holds 60% of the real time market
- By almost any measure, concentration is high and increasing



Information Asymmetry

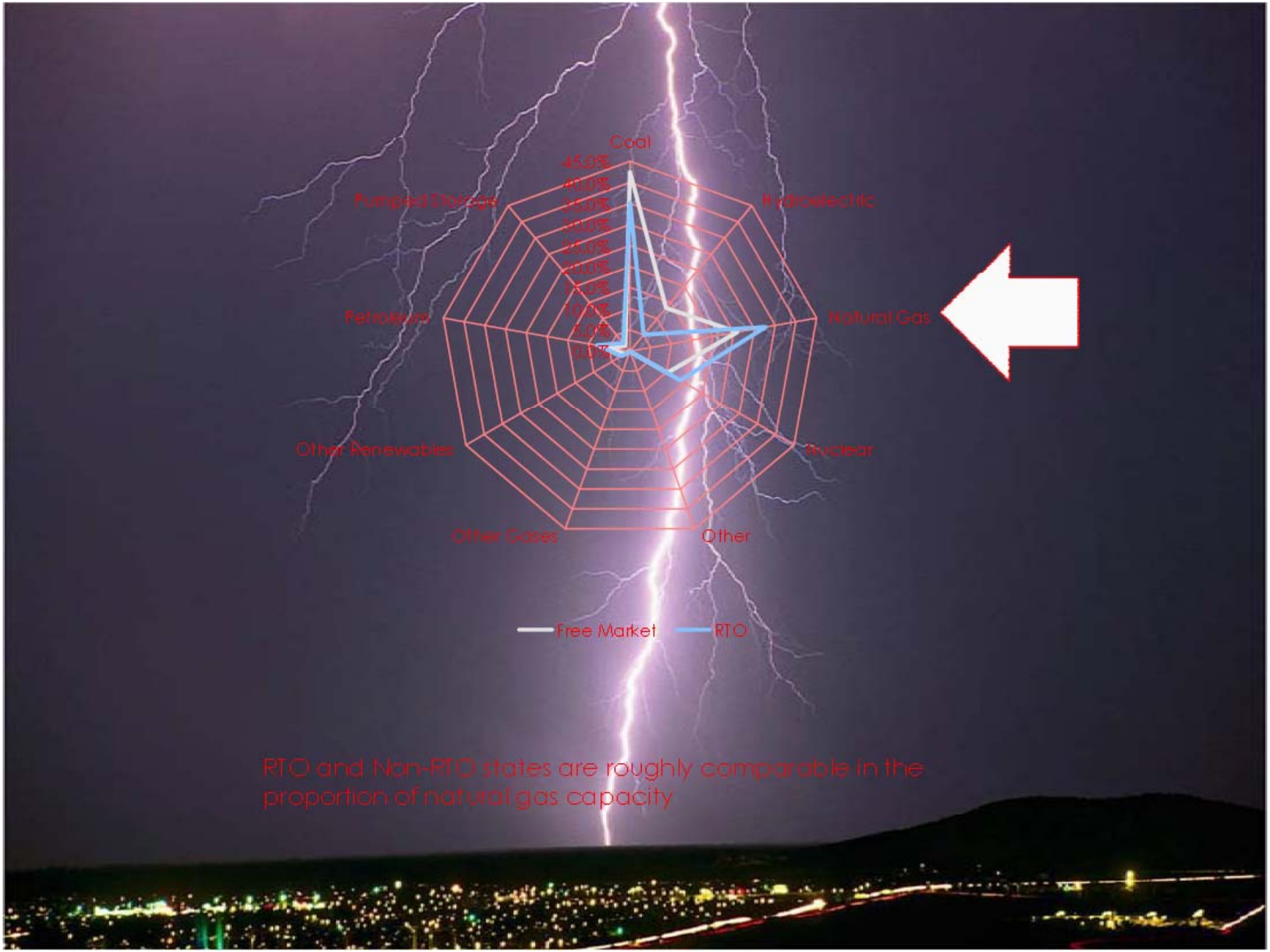
- Competition is enhanced by protecting the identity of bidders and the bids they make for prolonged periods
- Even the algorithms are secret
- Most larger players enjoy a strong informational advantage



Why does the bid curve stop with a small bid at $300.00/MWh?

Fuel Costs

- While coal is the primary U.S. fuel – disgustingly plentiful and inexpensive – natural gas provides 30% of our electric generating capacity
- Natural gas prices correlate closely with oil
- Oil prices have increased markedly over this period



RTO and Non-RTO states are roughly comparable in the proportion of natural gas capacity

Natural Gas Prices As An Explanatory Variable

Cochrane-Orcutt AR(1) regression -- iterated estimates

Source	SS	df	MS
Model	7.08228735	1	7.08228735
Residual	91.8172138	107	.858104801
Total	98.8995011	108	.915736121

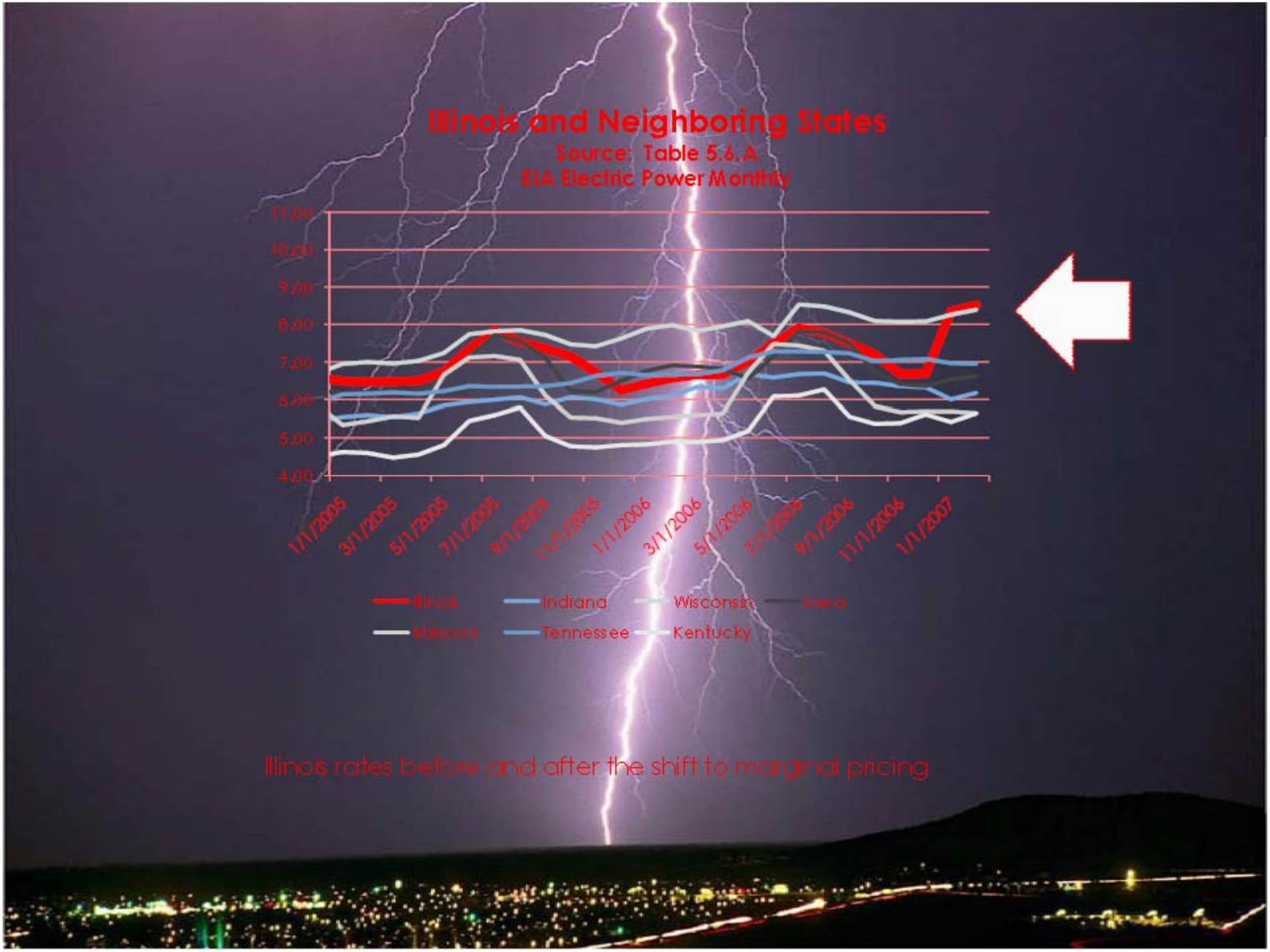
Number of obs	109
F(1, 107)	8.25
Prob > F	0.0049
R-squared	0.0716
Adj R-squared	0.0629
Root MSE	.92634

differential	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
henryhub	-.1974898	.0687429	-2.87	0.005	-.3337646	-.0612149
_cons	5.821075	.3969133	14.67	0.000	5.034241	6.60791
rho	.5557569					

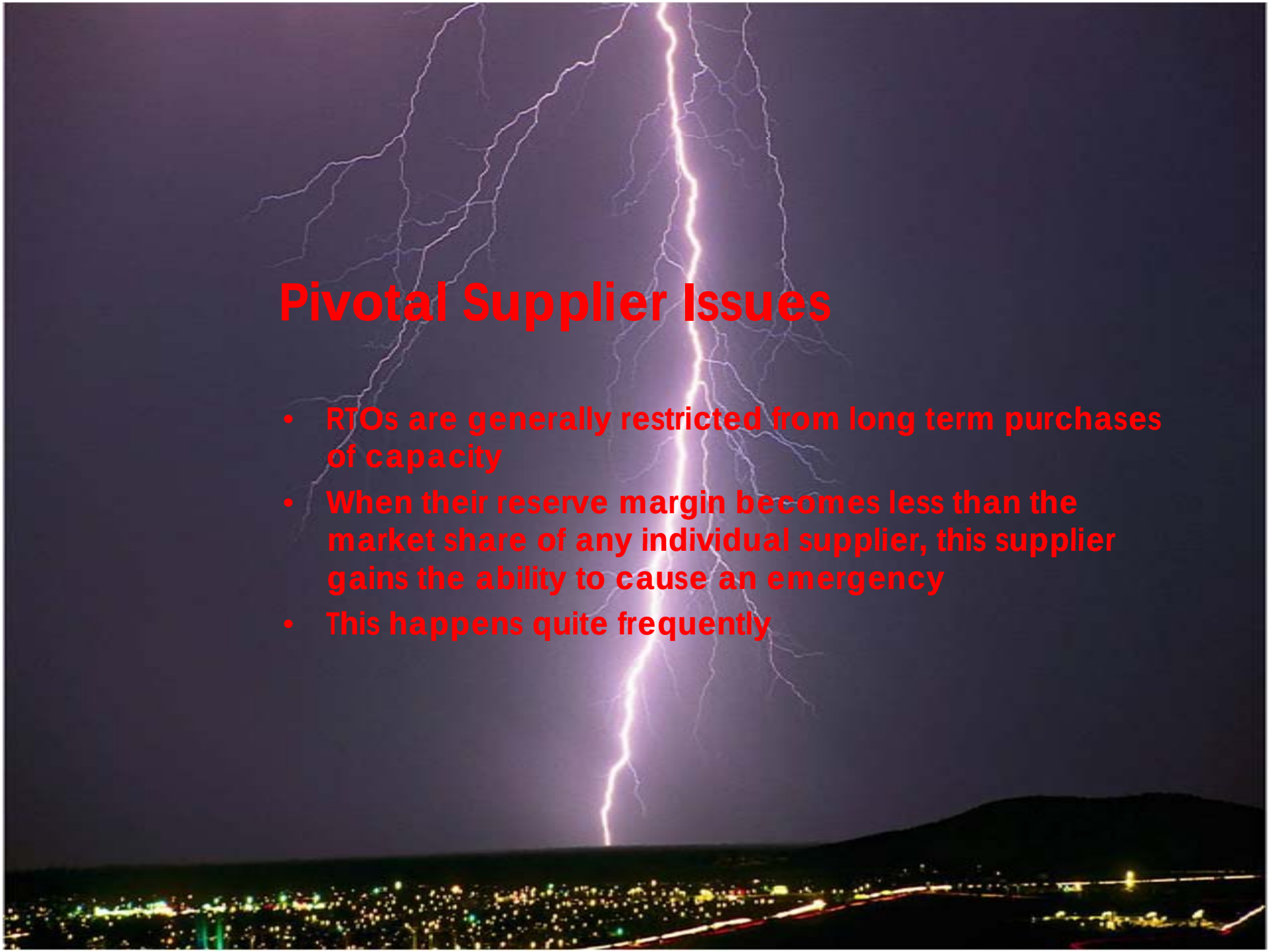
Durbin-Watson statistic (original) 0.912365
Durbin-Watson statistic (transformed) 1.837154

Producers Surplus

- Under traditional regulation, consumers are charged average price
- In RTO states, it is common for consumers to pay the marginal price
- The difference is called “producer’s surplus” and it can be a pretty penny



Illinois rates before and after the shift to marginal pricing



Pivotal Supplier Issues

- RTOs are generally restricted from long term purchases of capacity
- When their reserve margin becomes less than the market share of any individual supplier, this supplier gains the ability to cause an emergency
- This happens quite frequently

22-Jul-06	WECC-CAMX	CISO	PA	out 200 M	1,271,893	Weather - High Temperatures
24-Jul-06	WECC-CAMX	CISO	PA	855 MW	N/A	Weather - High Temperatures
24-Jul-06	WECC-CAMX	CISO	PA	N/A	tible Tariff (I-6) C	Weather - High Temperatures

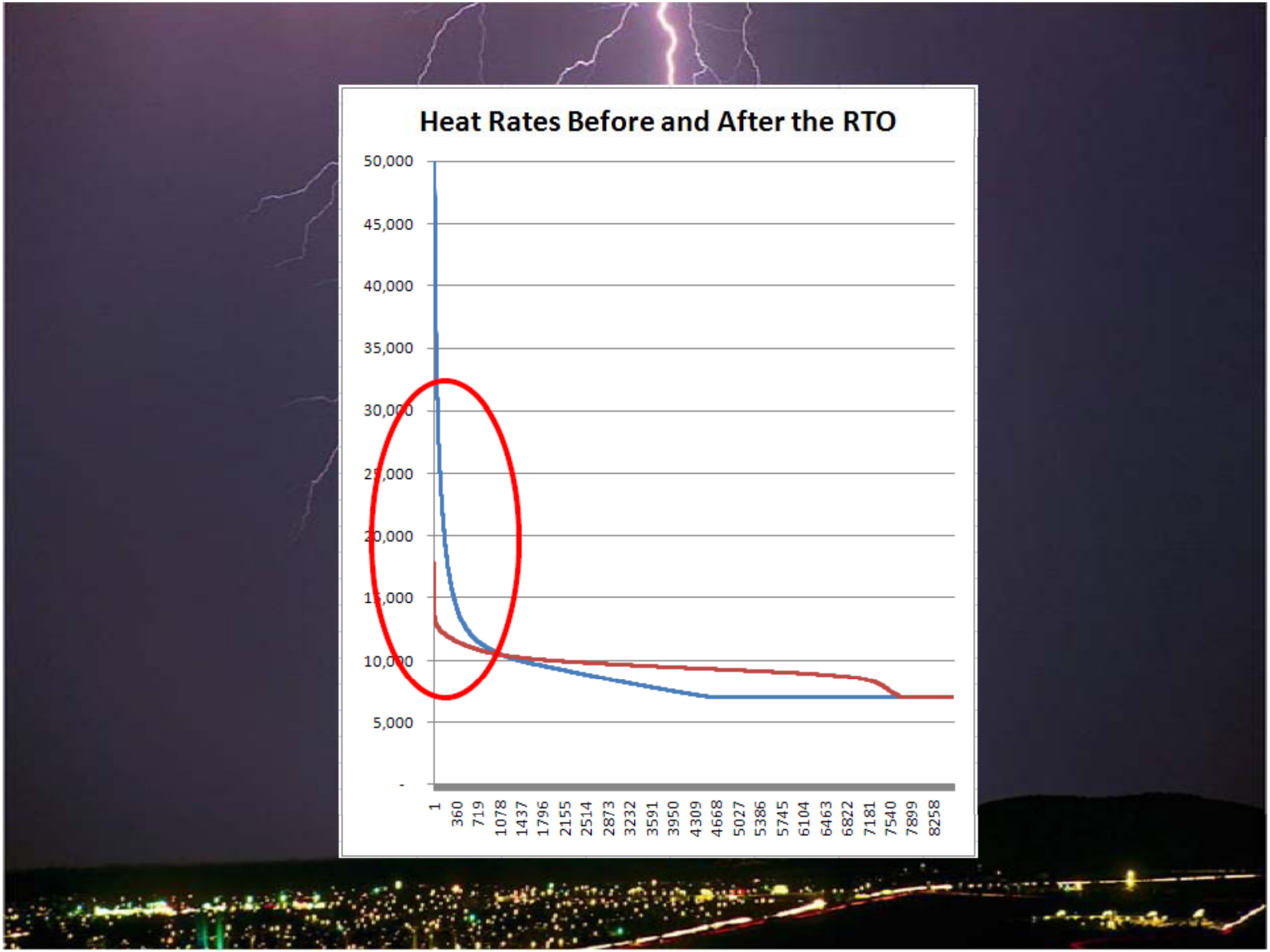
Yesterday's Non-simultaneous Peaks, Reserves, and Generation Limitations at time of Peak

Area	Peak Demand[1]	Actual Reserves[1]		Req. Reserves[1]	Gen. Outages/Limitations
Northwest SC	54,759	8.0%	4,366	3,833[2]	5,616
RM/DSW RC	39,374	10.7%	4,201	2,756	337
Calif./MX RC	65,049	7.6%	4,921	4,372	3,851

[1] Peak demands, Actual and Projected Reserves and Required Reserves are non-simultaneous accumulations of peaks as reported by each area within each Reliability Center.

[2] Required reserves calculated to be 7% of peak demand.

We have adopted a don't ask/don't answer policy on RTO shortages.


Heat Rates Before and After the RTO
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
-
1
360
719
1078
1437
1796
2155
2514
2873
3232
3591
3950
4309
4668
5027
5386
5745
6104
6463
6822
7181
7540
7899
8258

Where do we stand?

- Competition by committee hasn't been a great success story
- We haven't successfully addressed either market power or pivotal supplier issues
- The transfer of producer's surplus is an elephant in the living room in most policy discussions