

Arizona Public Service

Marketing and Trading

15234 Mohammad "Moe" S. Khatami, Sr. Energy Trader

May 2009

KILOWAT

200 240v 3w

Overview of APS

QUICK FACTS:

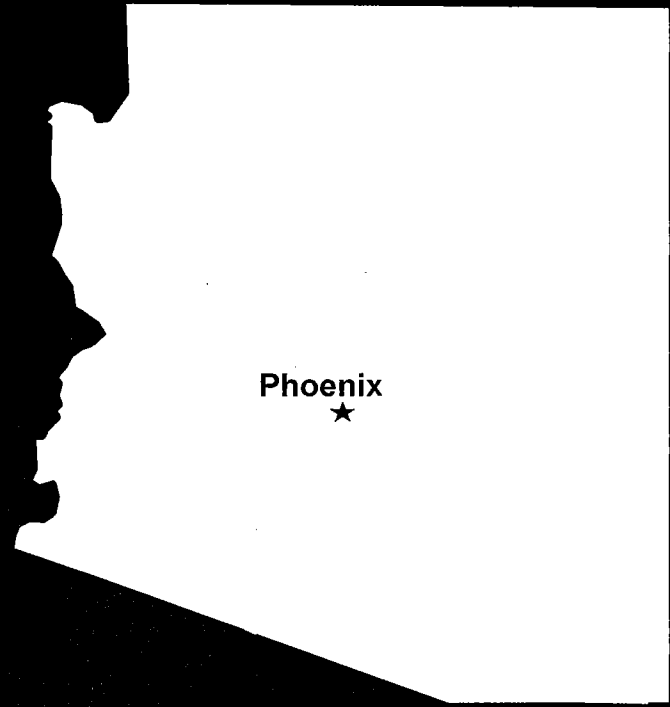
APS was incorporated April 29, 1886,
as Phoenix Illuminating Gas and
Electric Co.

APS serves more than a million people
and 70 wholesale customers.

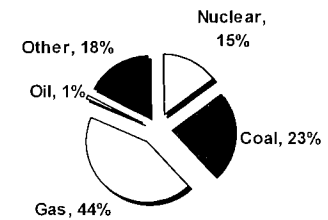
APS provides service as a utility
in Arizona, California, Nevada,
and New Mexico.

APS is a member of the Western
States Electric Association.

APS is a member of the Arizona
Electric Power Pool.



Native Resource Energy Mix

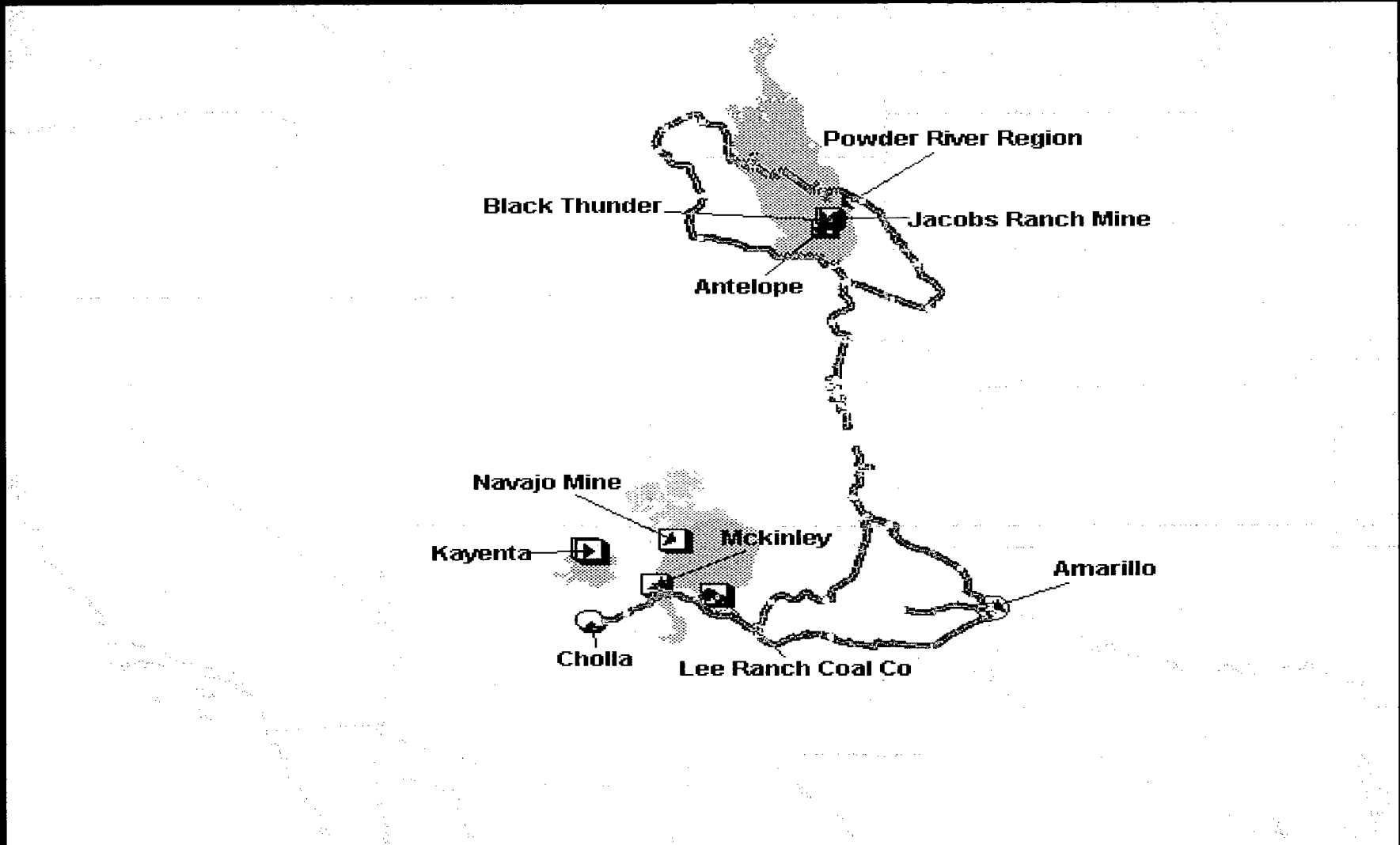


APS Marketing and Trading

- **Prime Responsibilities:-**

- **1) Optimize APS's System Resources to provide lowest cost reliable power for our customers. This is accomplished through the management of the Fuel and Purchased Power Budget (Coal / Natural Gas / Energy Purchases).**
 - Coal contracts are negotiated with several suppliers and are based on current markets with pre-set escalation factors. These contracts are typically set or negotiated for 10-15 years.
 - Natural Gas Hedging Program; volumes are derived from a least cost economic production model that looks at total system resources, long-range load forecast, along with forward look of energy markets. This Hedge Program was put in place 5 years ago to mitigate market risk and price volatility.
- **2) Optimize excess resources by participating in the off-system wholesale energy markets.**
 - Term markets, one month up to 10-years
 - Next-day market
 - Real-time market
- **3) Wholesale power markets products:-**
 - On-Peak blocks; 16 hours/day, 6-days/week
 - Super-peak blocks (hours 1800-2300), 6-days/week
 - Heat-rate options, based on a given HR multiplied by floating gas price

Cholla Coal Sources: Post McKinley Mine



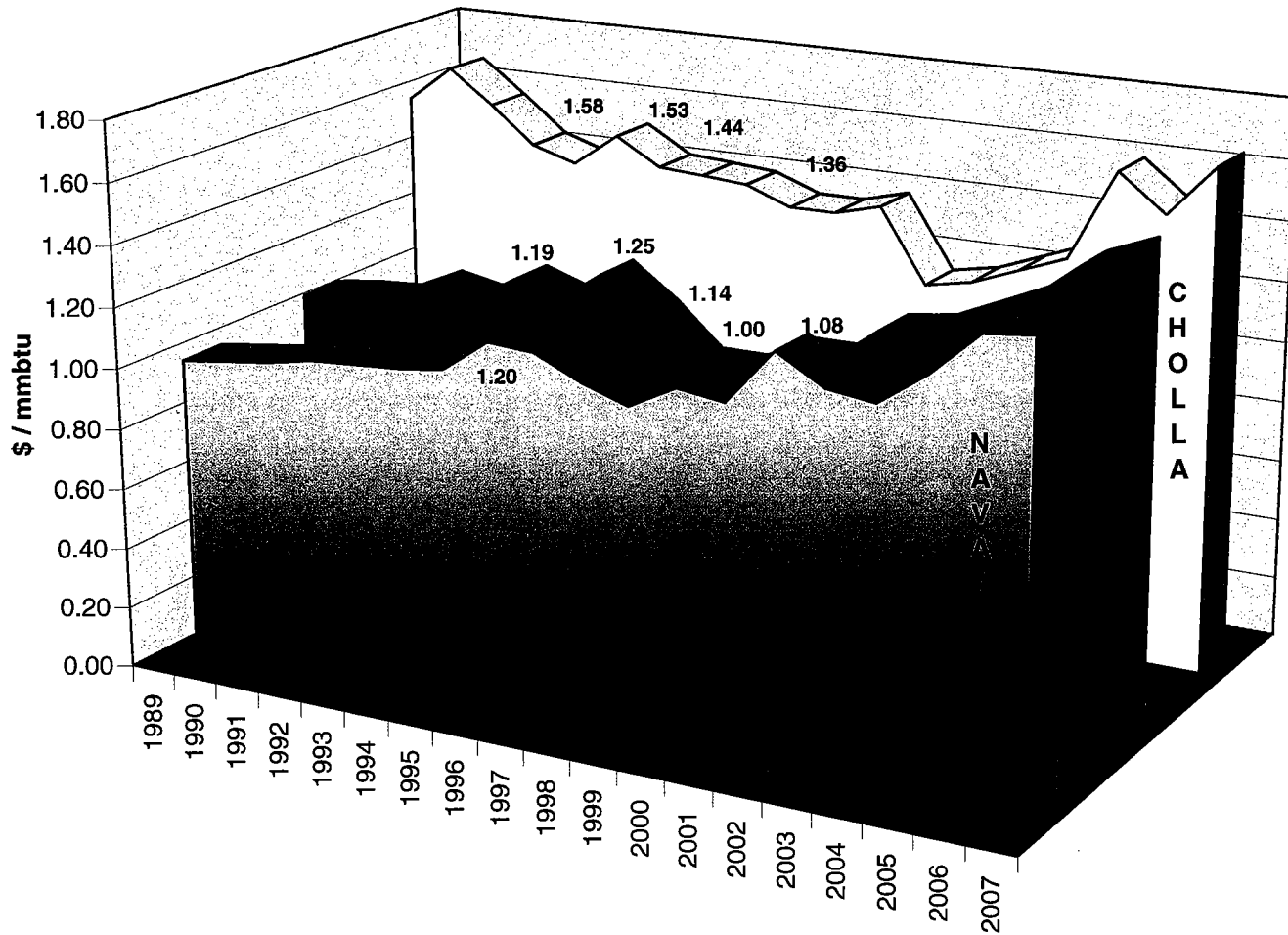
Cholla

Annual Deliveries & Burns in Tons

	Actual	Projected
	<u>2007</u>	<u>2008</u>
McKinley	3,532,136	3,438,609
Lee Ranch	826,378	1,000,000
Spring Creek	85,914	75,000
<u>Colowyo</u>	<u>48,458</u>	<u>47,000</u>
Total Deliveries	4,492,886	4,560,608
Coal Burns	4,327,055	4,093,115

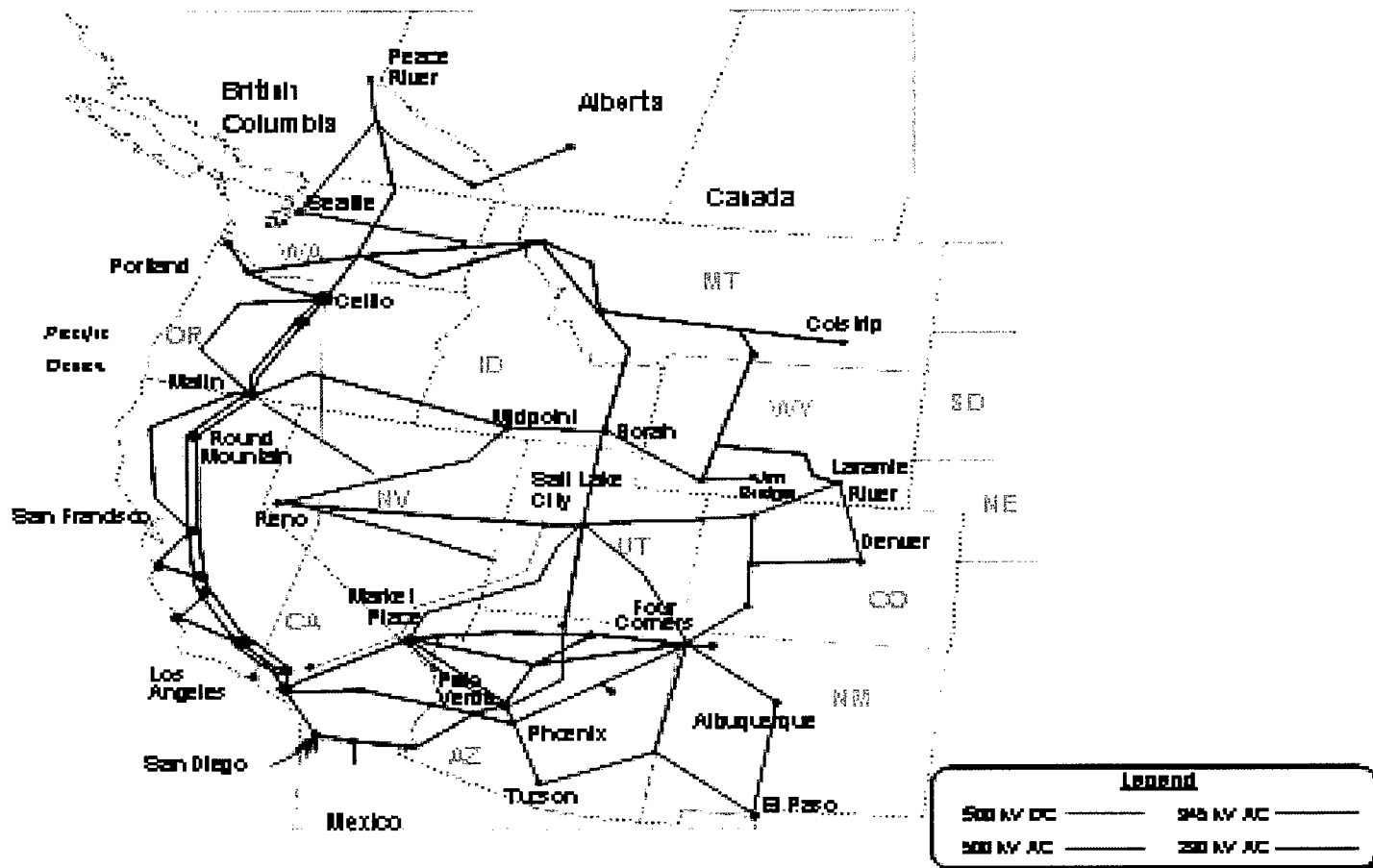
Coal Fuel Price Summary - \$/MMBTU

Annual Average Coal Prices

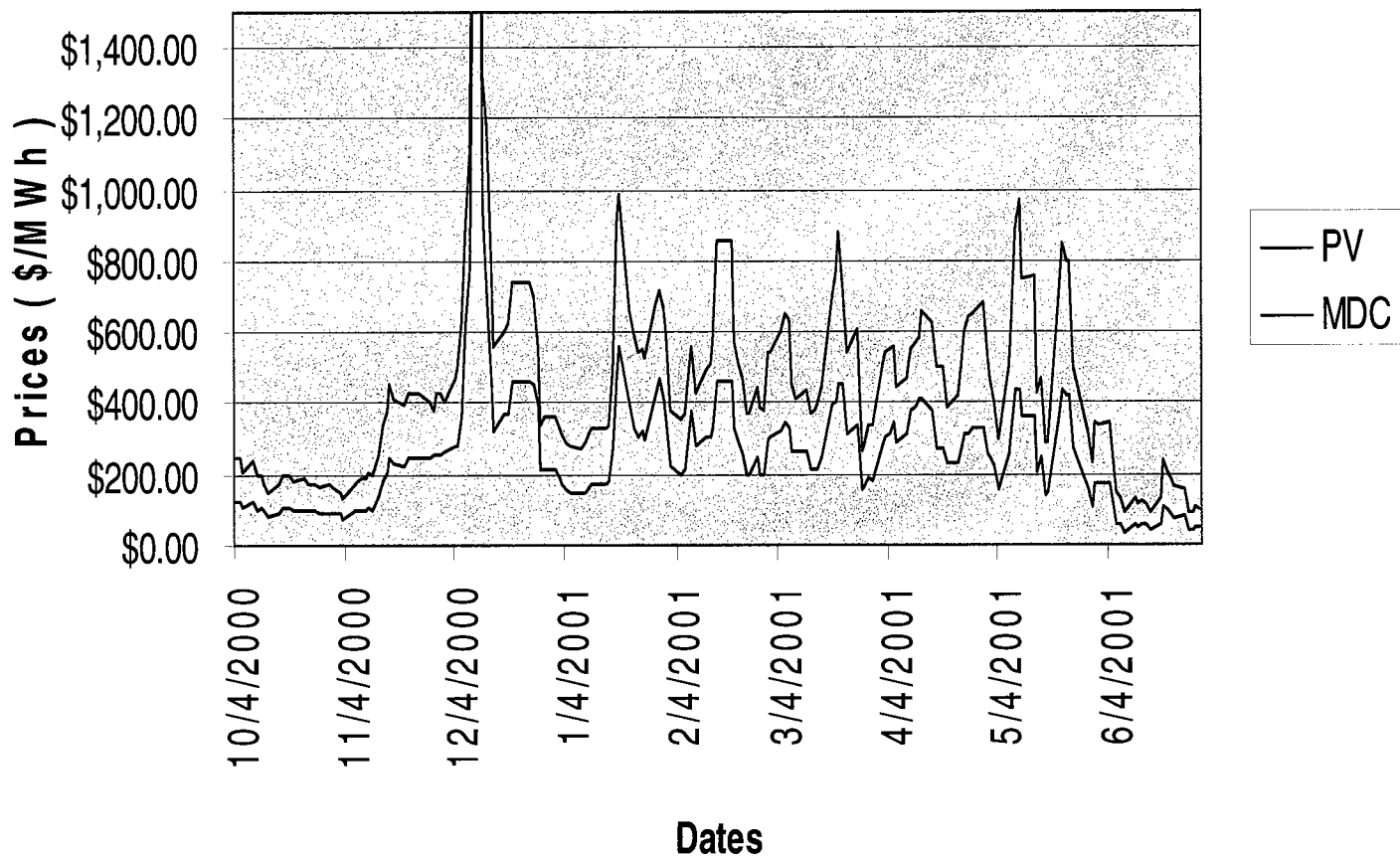


	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
NAVAJO	0.98	1.00	1.02	1.05	1.06	1.07	1.09	1.20	1.19	1.12	1.07	1.15	1.13	1.31	1.22	1.20	1.31	1.45	1.47
F CORNERS	1.03	1.05	1.06	1.13	1.10	1.19	1.14	1.25	1.14	1.00	1.00	1.08	1.08	1.20	1.22	1.29	1.36	1.49	1.55
CHOLLA	1.57	1.69	1.58	1.46	1.41	1.53	1.44	1.43	1.42	1.36	1.36	1.40	1.16	1.19	1.25	1.31	1.61	1.49	1.66

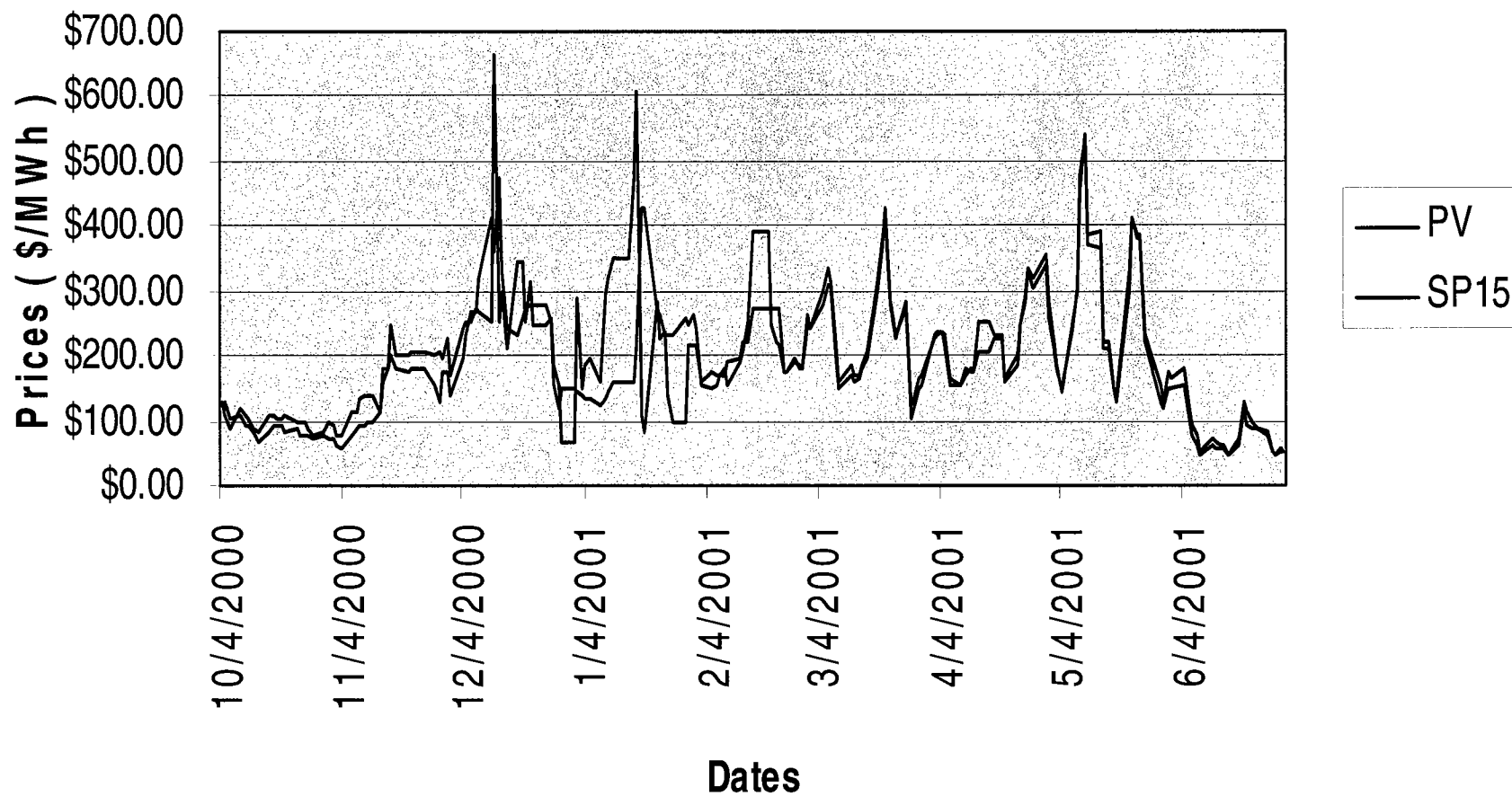
Western Transmission Grid



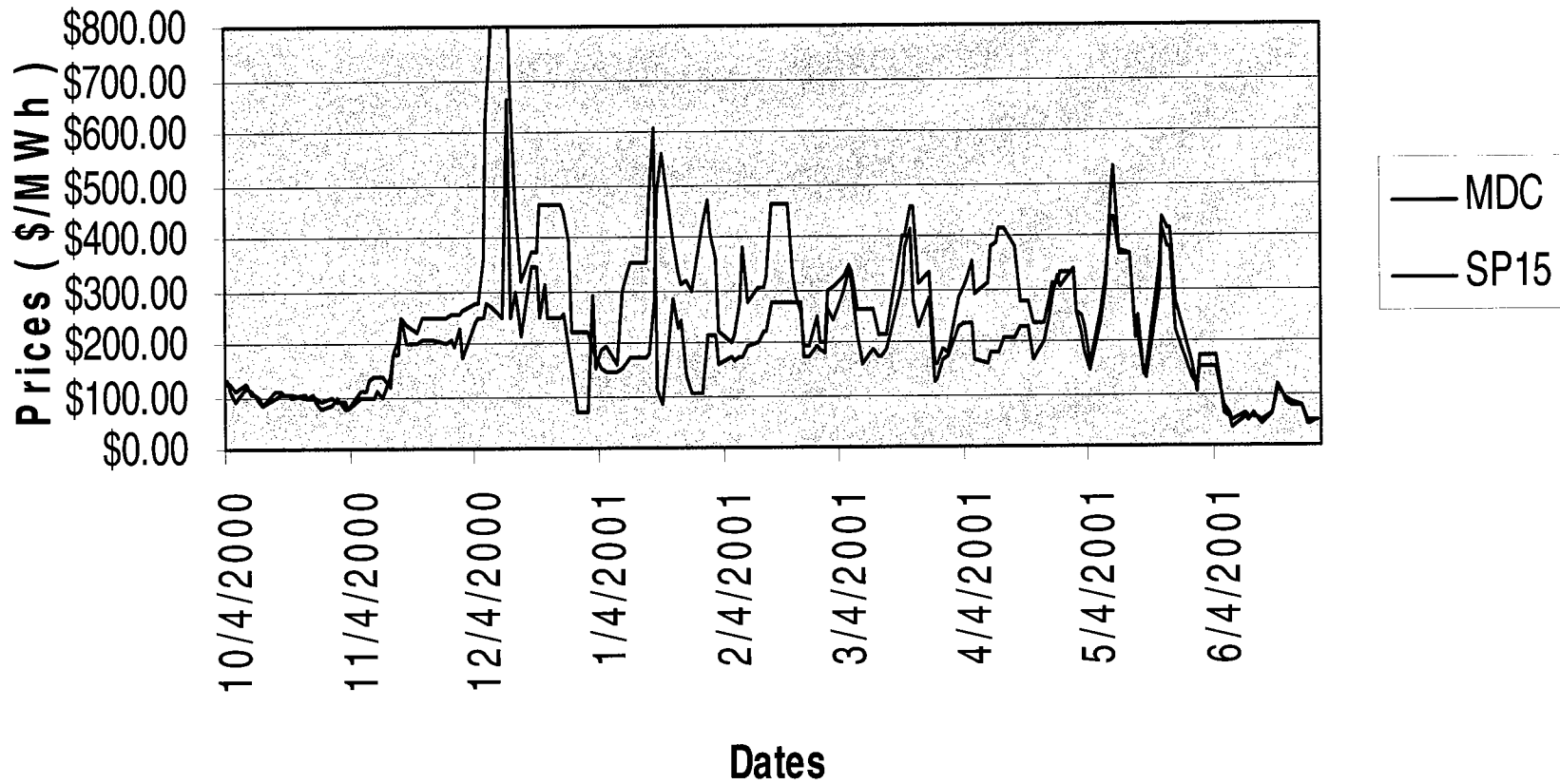
Palo Verde / MIDC Power Prices During the Energy Crisis 2000-2001



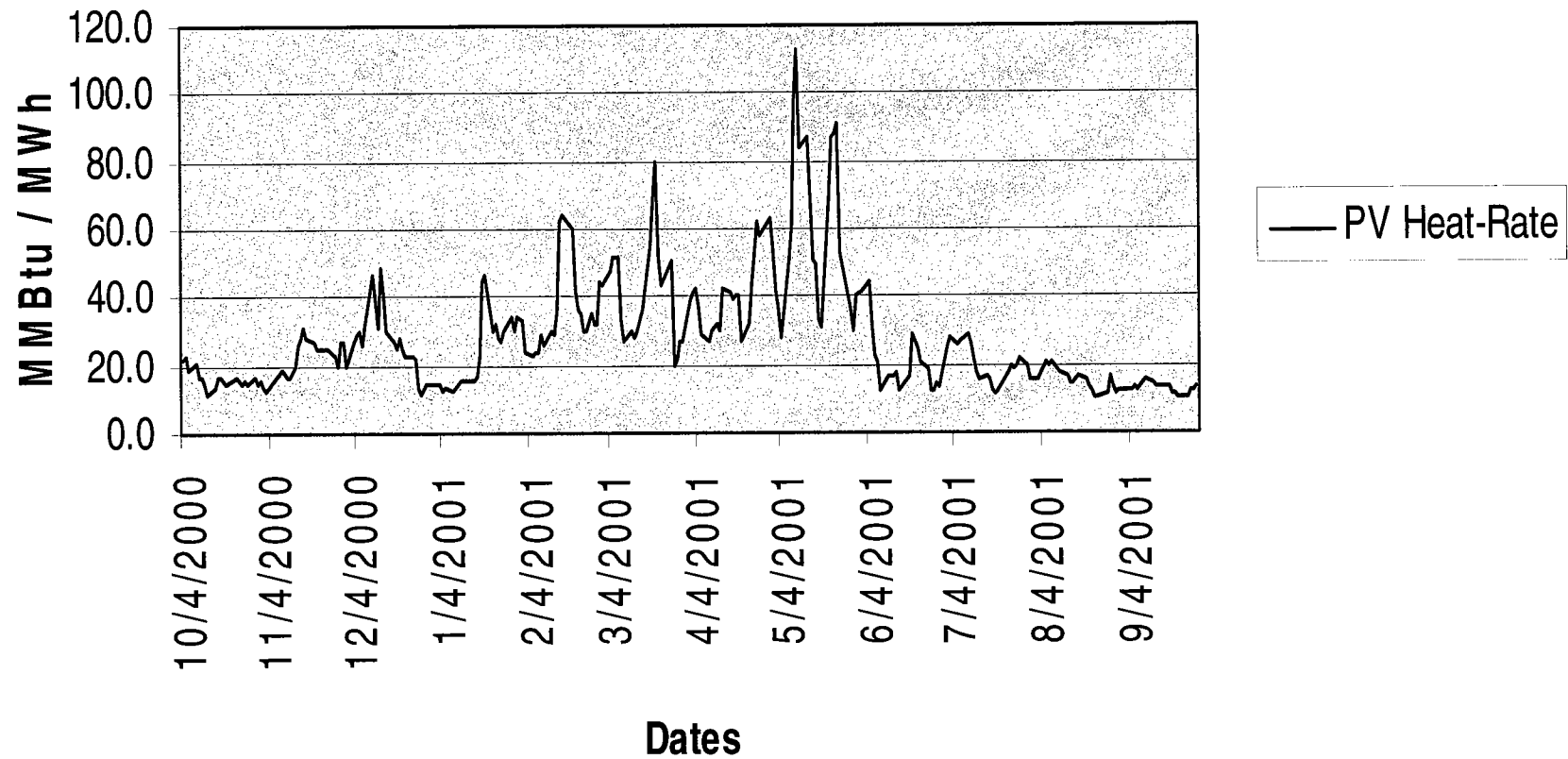
Palo Verde / SP15 Power Prices During the Energy Crisis



SP15 / MIDC Power Prices During the Energy Crisis 2000-2001

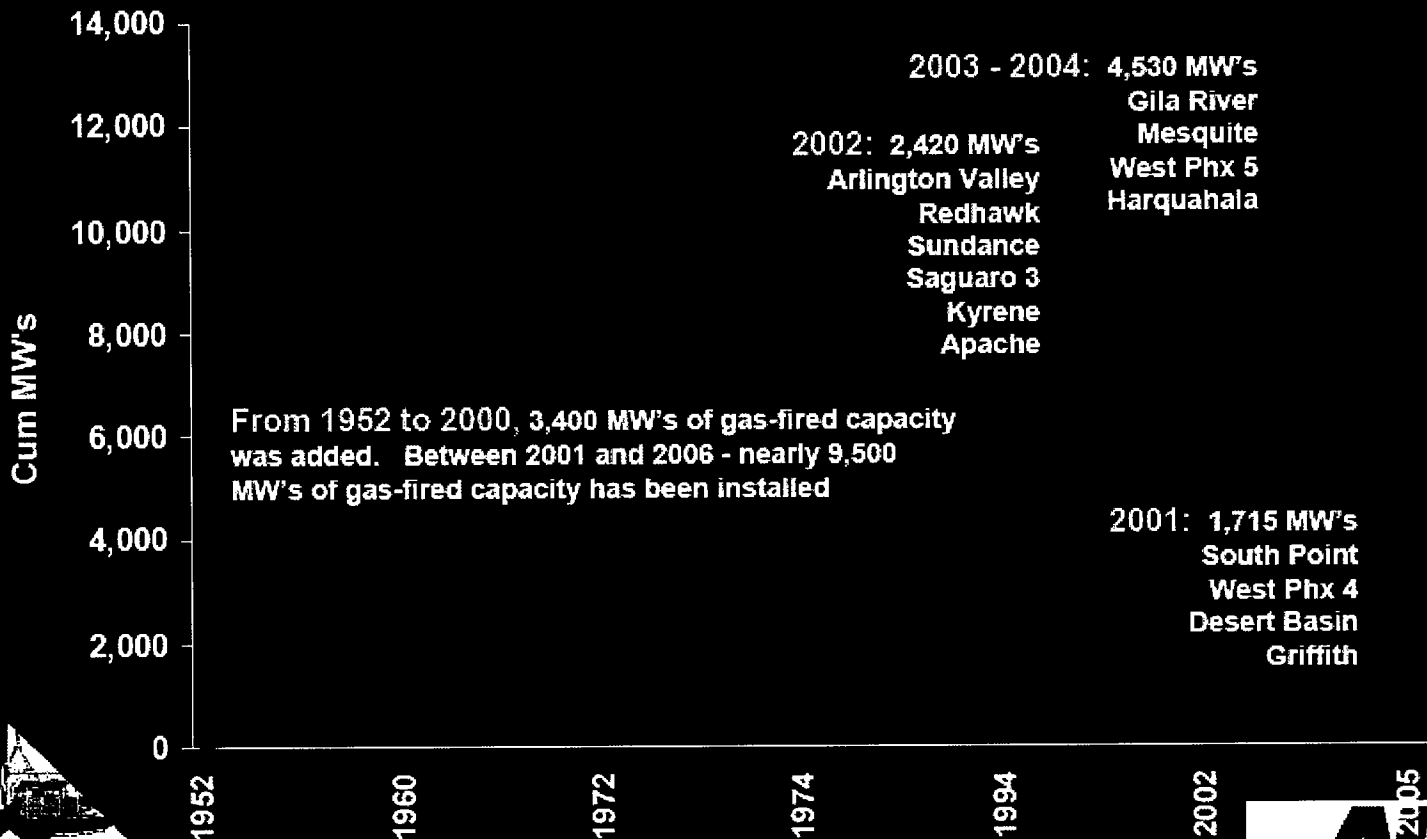


Palo Verde Effective Market Heat-Rate During the Energy Crisis; 2000-2001



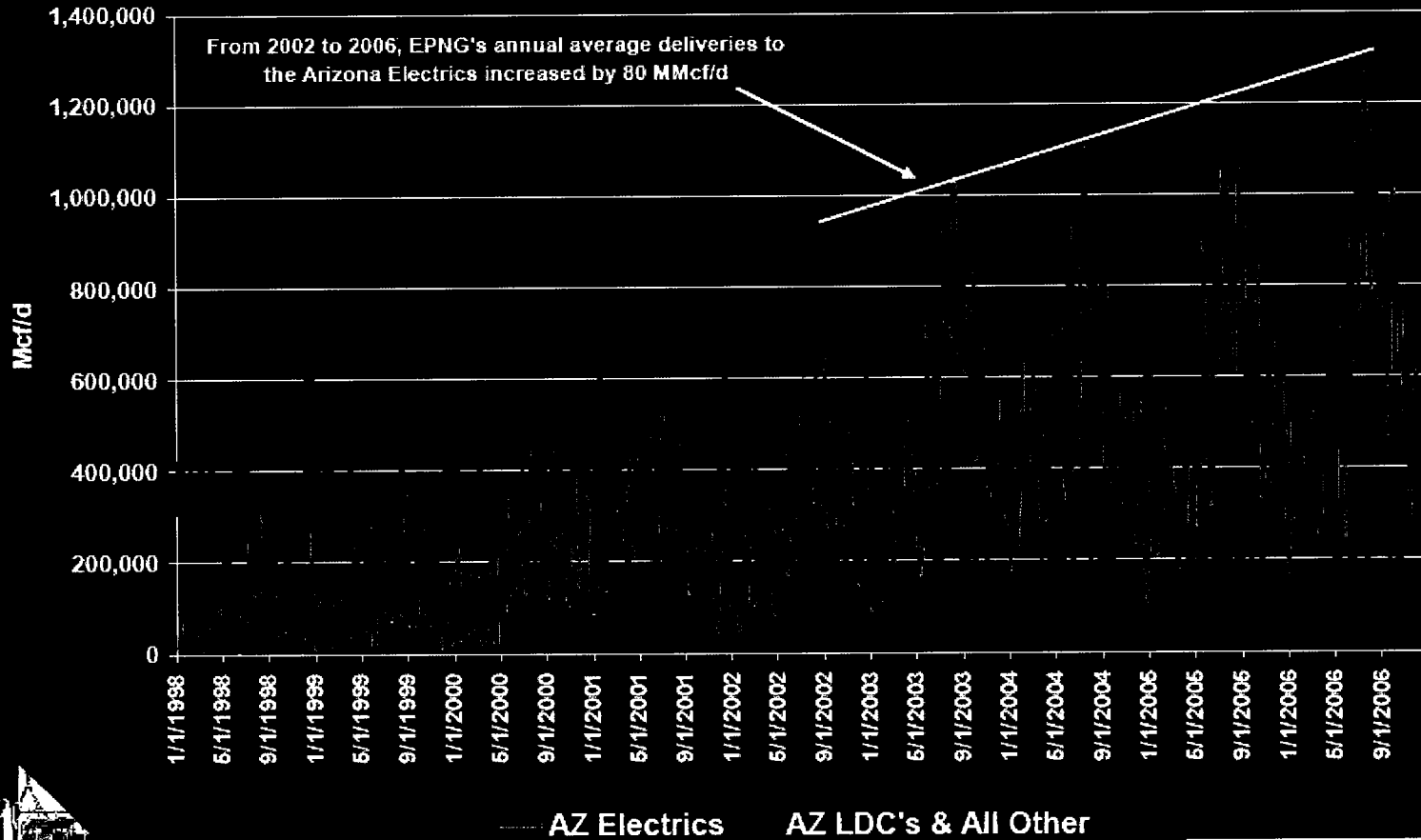
Natural Gas Fueled Electric Generation Capacity in Arizona

2005 - 2006: 837 MW's
Santan



EPNG Daily Deliveries to Arizona

January 1998 thru December 2006



2009 Load/Resource Balance for Native Load

Month	Summer 15%					Non-Summer 12%																												
	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09										
Required Reserve Margin	12%	12%	12%	12%	12%	12%	12%	15%	15%	15%	15%	15%	12%	12%	12%	12%	12%	15%	15%	15%	15%	15%	12%	12%	12%	12%								
Peak Load ⁽²⁾	4,326	3,872	3,660	3,929	4,214	4,862	5,798	6,487	7,252	7,254	6,582	5,748	5,257	4,133	4,107	4,317	4,326	3,872	3,660	3,929	4,214	4,862	5,798	6,487	7,252	7,254	6,582	5,748	5,257	4,133	4,107	4,317		
Reserves ⁽¹⁾	557	502	419	452	487	565	620	877	992	992	891	838	611	534	530	555	557	502	419	452	487	565	620	877	992	992	891	838	611	534	530	555		
Total Requirement	4,883	4,374	4,080	4,381	4,700	5,427	6,417	7,364	8,244	8,246	7,473	6,586	5,867	4,667	4,637	4,872	4,883	4,374	4,080	4,381	4,700	5,427	6,417	7,364	8,244	8,246	7,473	6,586	5,867	4,667	4,637	4,872		
GENERATION																																		
Nuc/Coal	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897		
Combined Cycle	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862		
Gas 10000 <=> 13000	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	
Gas > 13000	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	572	
Existing Renewables	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
Seasonal Variation & APS Renew	133	133	133	(5)	(2)	(1)	(1)	(16)	(16)	(16)	(17)	(17)	(3)	(3)	134	134	133	133	133	(5)	(2)	(1)	(1)	(16)	(16)	(16)	(17)	(17)	(3)	(3)	134	134		
Planned Max Capacity on Maintenance	(737)	(964)	(1,268)	(1,377)	(1,430)	(1,425)	(896)	-	-	-	-	-	(551)	(1,004)	(1,380)	(382)	(737)	(964)	(1,268)	(1,377)	(1,430)	(1,425)	(896)	-	-	-	-	(551)	(1,004)	(1,380)	(382)	(737)		
Total Generation	5,582	5,355	5,051	4,804	4,754	4,760	5,289	6,170	6,170	6,170	6,170	6,170	5,632	5,180	4,940	5,938	5,582	5,355	5,051	4,804	4,754	4,760	5,289	6,170	6,170	6,170	6,170	5,632	5,180	4,940	5,938			
LONG-TERM CONTRACTS																																		
SRP Territorial	172	172	172	172	172	172	172	176	176	176	176	176	176	176	176	176	172	172	172	172	172	172	172	172	176	176	176	176	176	176	176	176		
SRP Contingent	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	
Pac Exchange	(480)	(480)					480	480	480	480	480	480		(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	(480)	
RELIABILITY/RFP OTHER																																		
Gila River Power	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
Morgan & PNM							150	150	650	650	650	650	425	150	150																			
Renewable Res, ComV & Other Renew	41	41	41						56	56	56	58	58	59	59	59	41	41	41															
Yuma, Other Ct's	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	
Mkt Purchases (economic energy reqmt)	105	108	108	75	250	250	250	300	100	100	100	100	200	200	100	100	105	108	108	75	250	250	250	300	100	100	100	100	200	200	100	100		
ED3 Capacity	30	33	33	35	48	70	70	90	90	90	70	70	48	48	33	35	30	33	33	35	48	70	70	90	90	90	70	70	48	48	33	35		
Index Purchases								200	200	200	200	200																						
Long Call Options (capacity requirement)																																		
Short Call Options (capacity optimization)																																		
Market Sales Outrights							(58)	(58)	(108)	(108)	(108)	(108)	(108)	(58)	(58)																			
Total Purchases	526	532	1,012	1,006	1,194	1,320	1,803	2,502	2,302	2,302	2,284	1,579	1,233	753	546	548	526	532	1,012	1,006	1,194	1,320	1,803	2,502	2,302	2,302	2,284	1,579	1,233	753	546	548		
Long/(Short)	1,226	1,513	1,984	1,430	1,248	653	675	1,308	228	226	981	1,163	998	1,266	849	1,614	1,226	1,513	1,984	1,430	1,248	653	675	1,308	228	226	981	1,163	998	1,266	849	1,614		
Implied Reserve Margin	38%	48%	69%	50%	43%	26%	25%	37%	18%	18%	32%	36%	32%	41%	31%	47%	38%	48%	69%	50%	43%	26%	25%	37%	18%	18%	32%	36%	32%	41%	31%	47%		

Note 1: Reserves = [Peak Load + DE - SRP Territorial - Pac Exchange] * Required Reserve Margin (Calculated based on peak hour of the month.)

Note 2: Peak Load Forecast based on Q4 Update with ED3 and COW

Note 3: Maintenance Plan based on 2008 Budget

Note 4: Full output of Sundance generation is modeled despite a 100 MW shortage in firm transmission.



Power Plants/Contracts

- 1147 MW Nuclear
- 1750 MW Coal
- 2400 MW Combined cycle
- 430 MW Steam units
- 1090 MW Peaking units
- 145 MW – Wind, Geothermal, Biogas, Solar
- 1350 MW Long term contracts – Diversity exchange



Current Hedge Plan Specifics

Rolling three years forward

85% of price risk hedged in Year One

50%-60% in Year Two

30%-40% in Year Three

Natural gas basis risk hedged

Compliance independently monitored



System Hedge Strategy Compliance Review
Date of Report: 3/2/2009(based on Bal Report as of 2/17/2009)

	Years 2009 - 2012												
Total Energy	Q2'09	Q3'09	Q4'09	Q1'10	Q2'10	Q3'10	Q4'10	Q1'11	Q2'11	Q3'11	Q4'11	Q1'12	Q2'12
Hedge Percent Requirement ¹	85%	85%	85%	85%	85%	50-60%	50-60%	50-60%	50-60%	30-40%	30-40%	30-40%	30-40%
Current Hedge Percent	83.5%	83.2%	83.2%	84.4%	84.0%	50.4%	53.7%	57.7%	51.9%	34.8%	35.1%	34.9%	34.3%
In Compliance?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

	Years 2009 - 2012												
Natural Gas Basis	Q2'09	Q3'09	Q4'09	Q1'10	Q2'10	Q3'10	Q4'10	Q1'11	Q2'11	Q3'11	Q4'11	Q1'12	Q2'12
Current Hedge Percent ²	99.8%	97.3%	102.8%	100.6%	101.2%	96.6%	96.8%	100.0%	98.2%	100.0%	100.0%	100.0%	100.0%
In Compliance?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

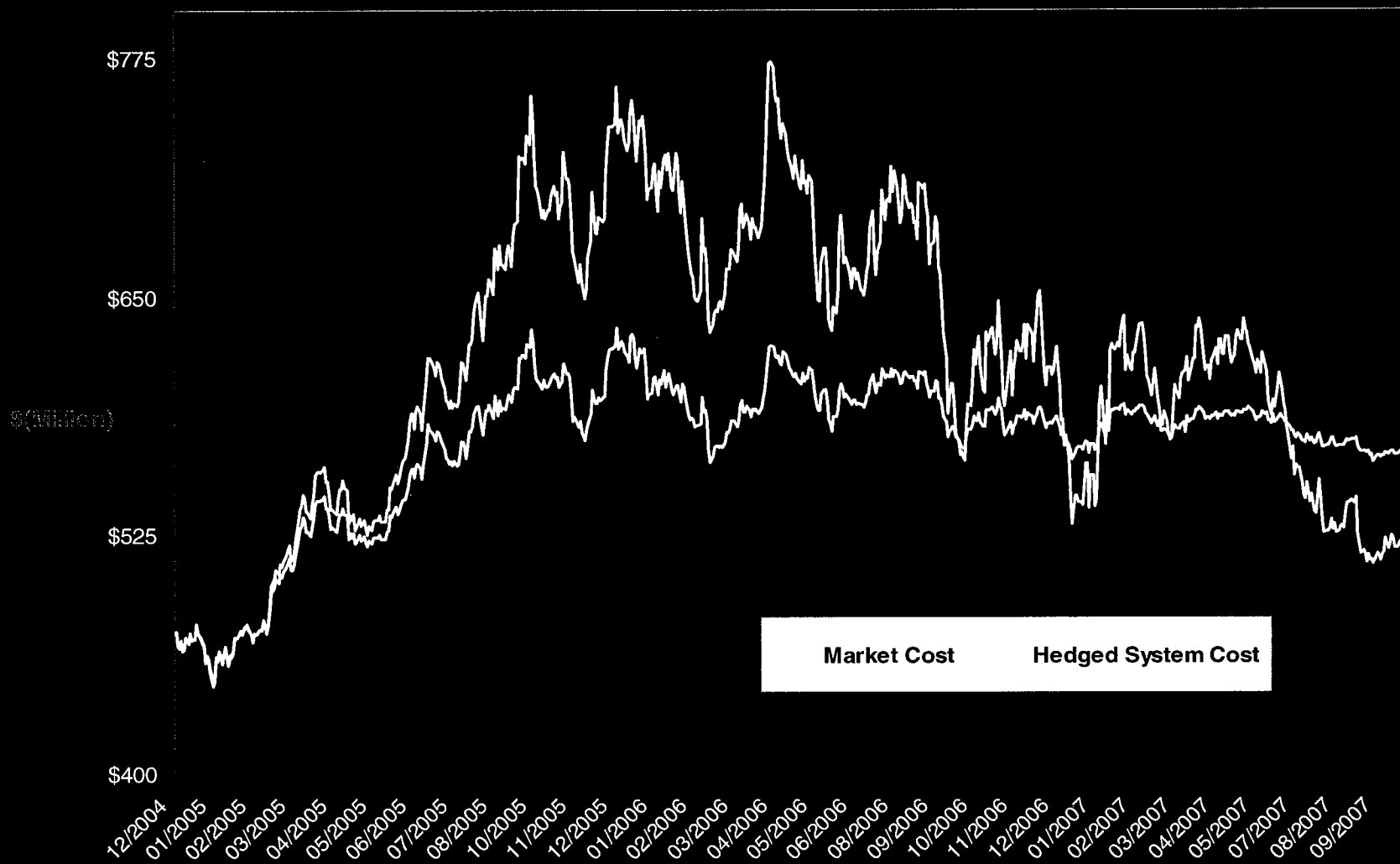
¹ - 85% hedge has a tolerance band of +/- 2 percentage points.

² - Basis hedge percent currently has a tolerance band of +/- 5 percentage points of the natural gas position.
 The natural gas position is part of the total energy hedge.

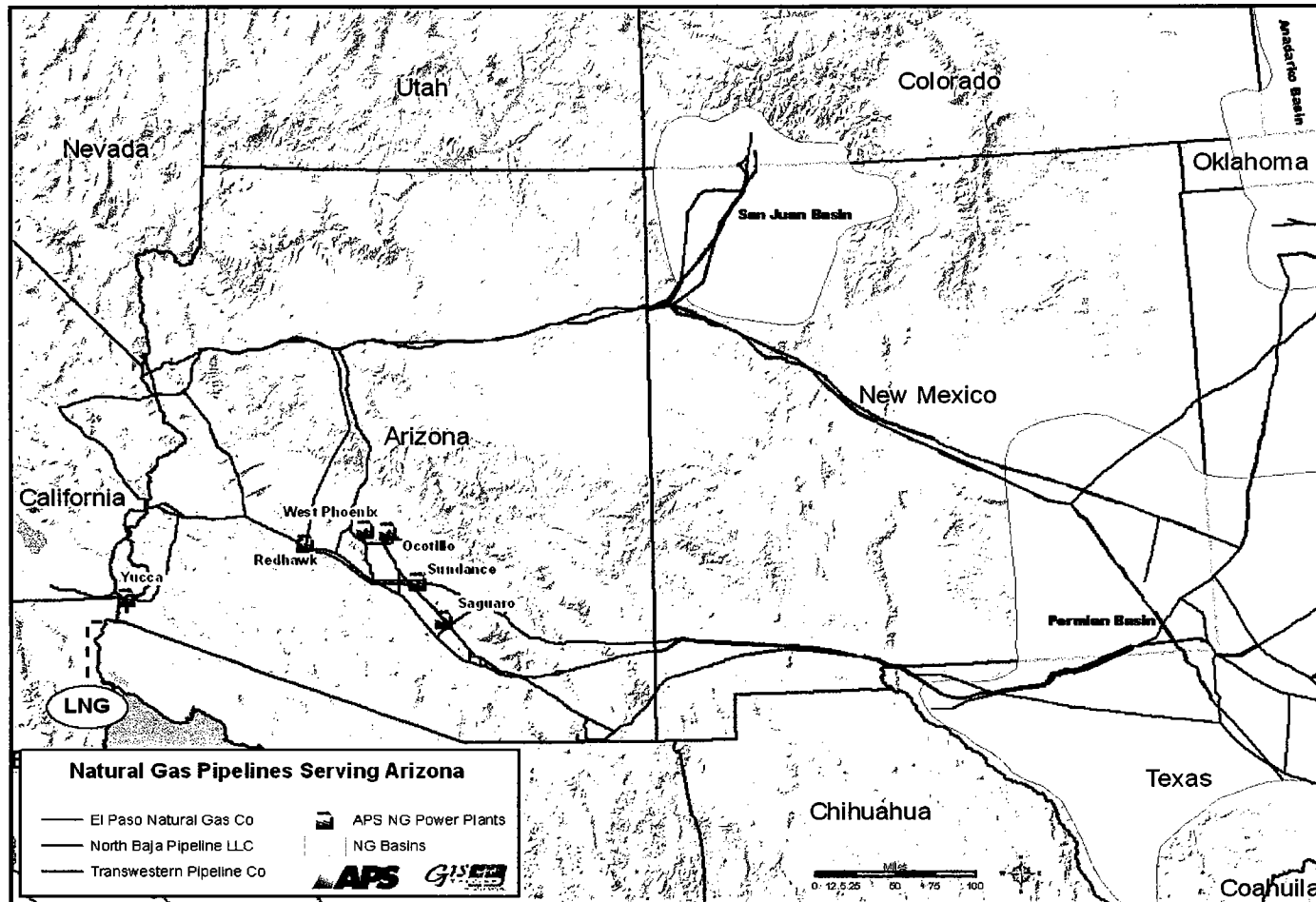


APS System Hedge Report

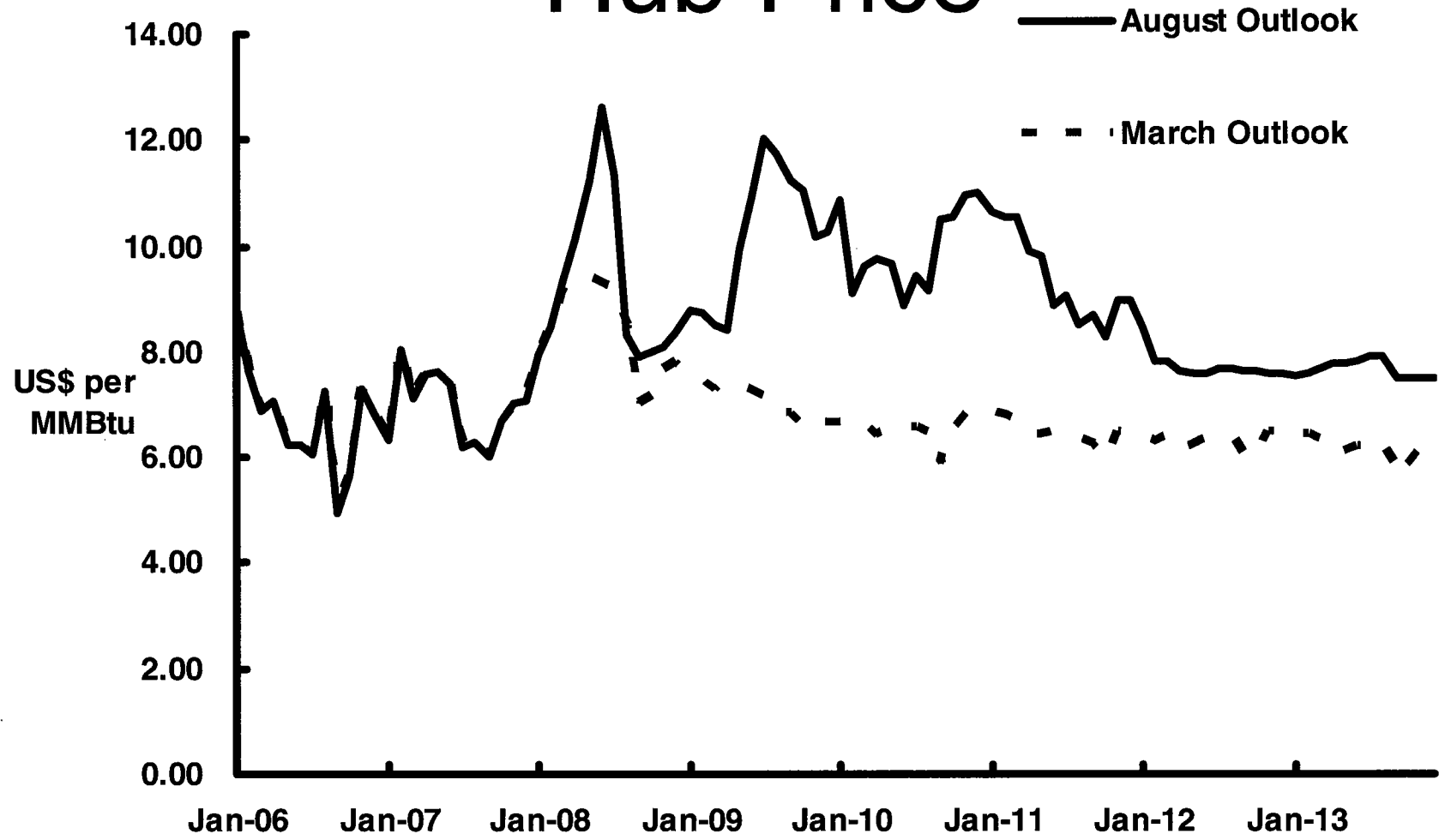
Comparison of Hedge Costs to Market



Natural Gas Pipelines Serving Arizona



Changing Outlook for Henry Hub Price



Source: Cambridge Energy Research Associates.