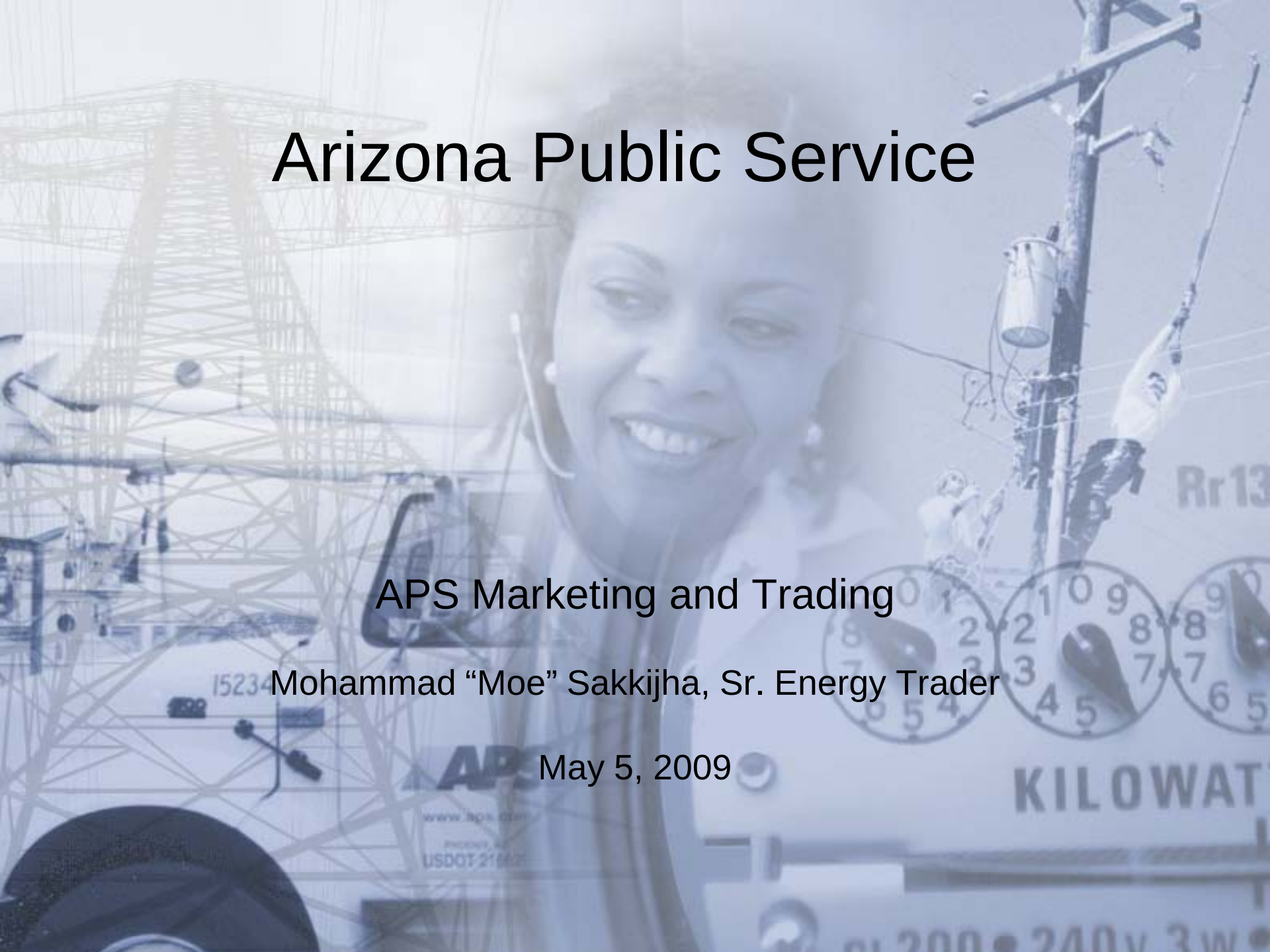
Arizona Public Service



APS Marketing and Trading

Mohammad “Moe” Sakkijha, Sr. Energy Trader

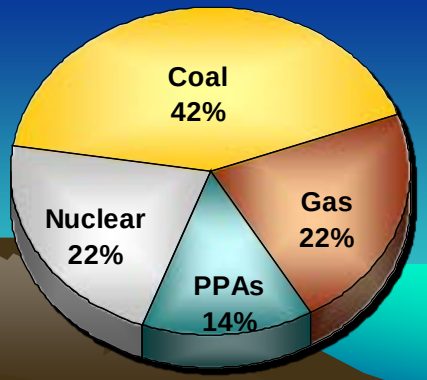
May 5, 2009

Overview of APS

QUICK FACTS:

- APS was incorporated April 29, 1886, as Phoenix Illuminating Gas and Electric Co.
- APS serves more than a million retail and 73 wholesale customers.
- APS customer growth is 4 times the U.S. average.
- APS has about 7,500 employees.
- APS serves all or portions of 11 of Arizona's 15 counties — 4th largest operating company service area in the U.S.
- APS has more than 5,000 miles of transmission lines, 26,000 miles of distribution lines and more than 14,000 miles of underground cable.

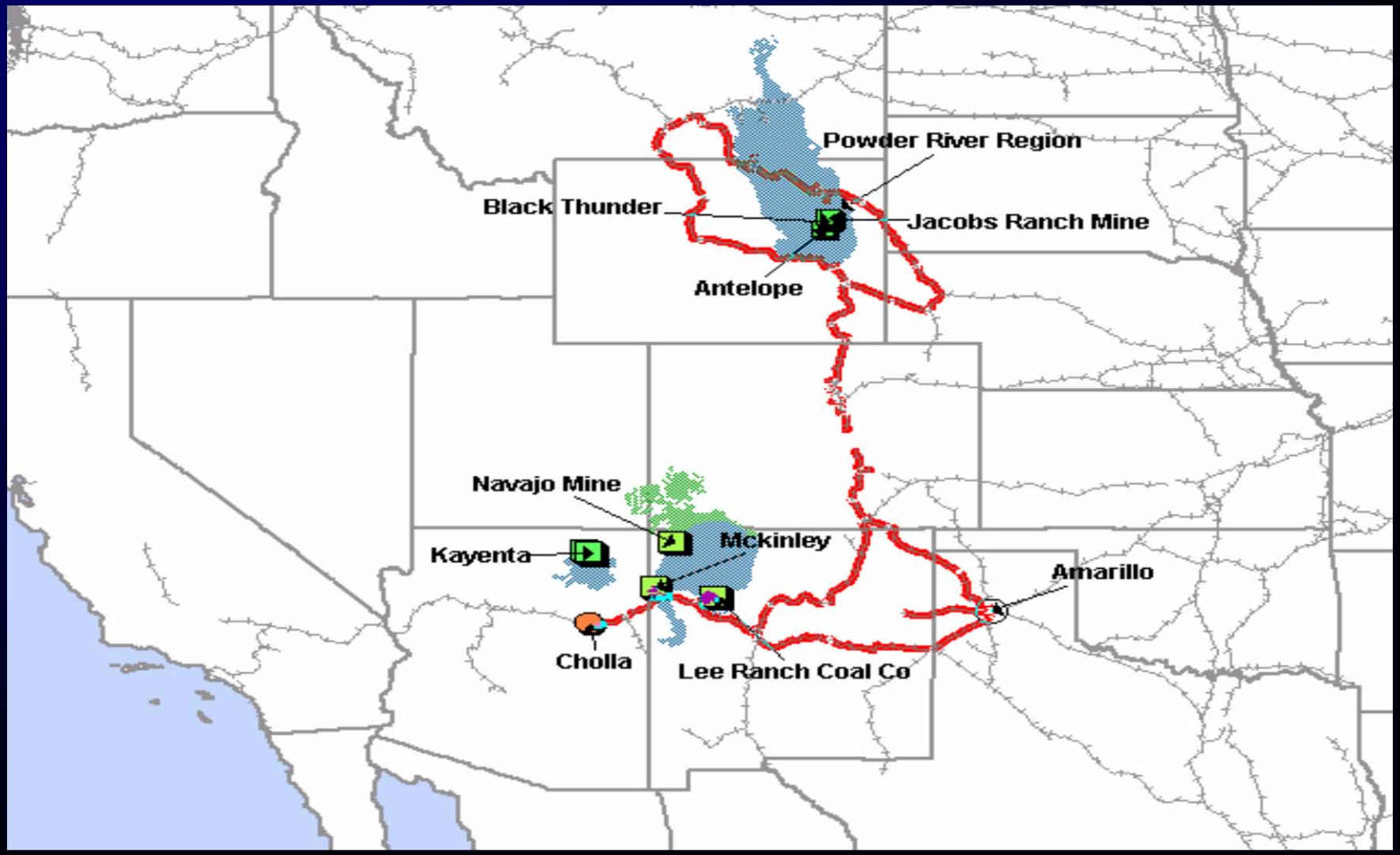
APS' 2009 Native Load Energy Mix



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.
    - Off-Peak blocks; 8 hours/day, 6-days/week plus Sunday.
    - Super-peak hours (hours 1300-2000), 6-days/week.
    - Heat-rate options, based on a given HR multiplied by floating gas price.

Cholla Coal Sources: Post McKinley Mine

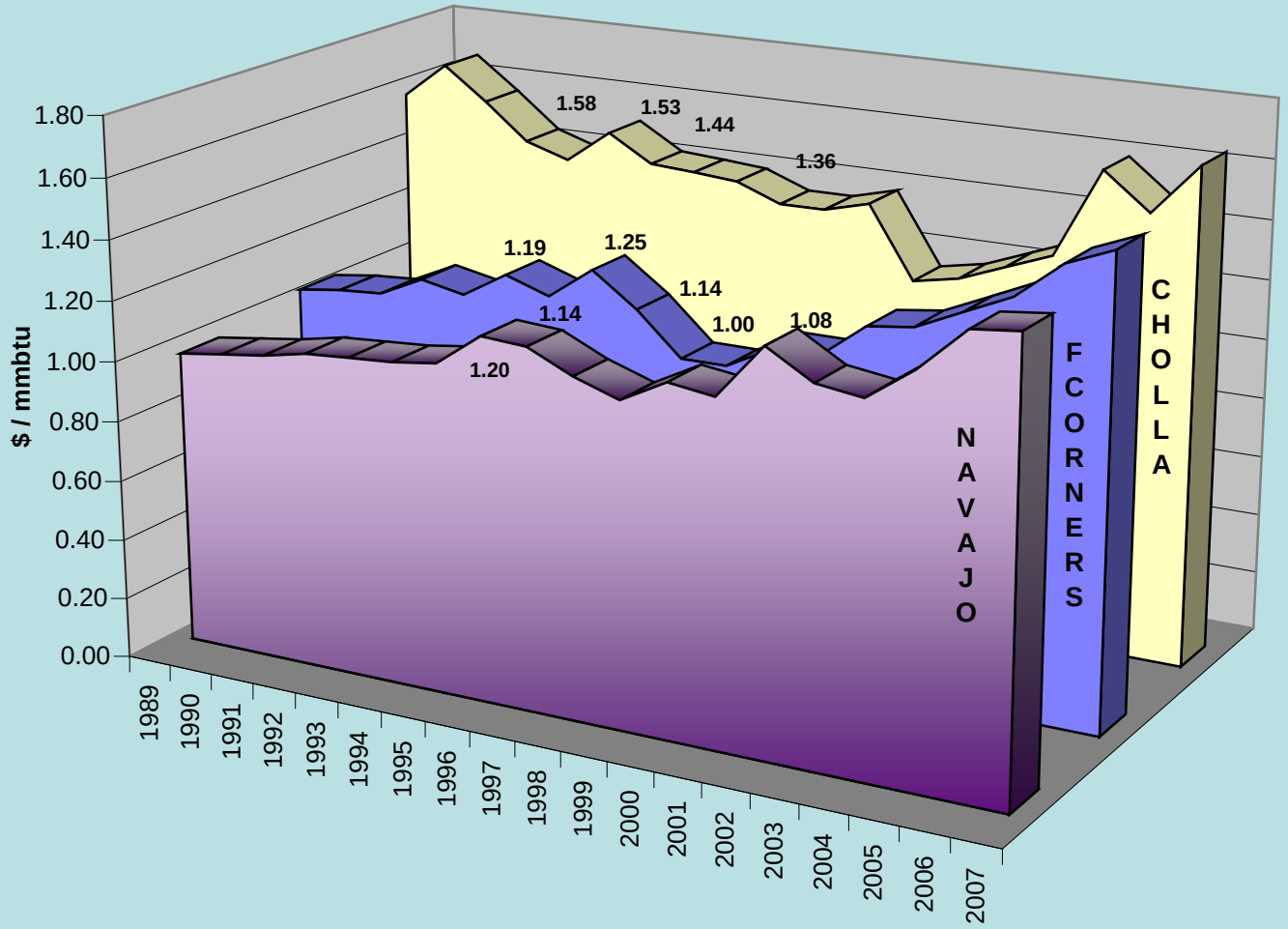


Cholla
Annual Deliveries & Burns in Tons

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

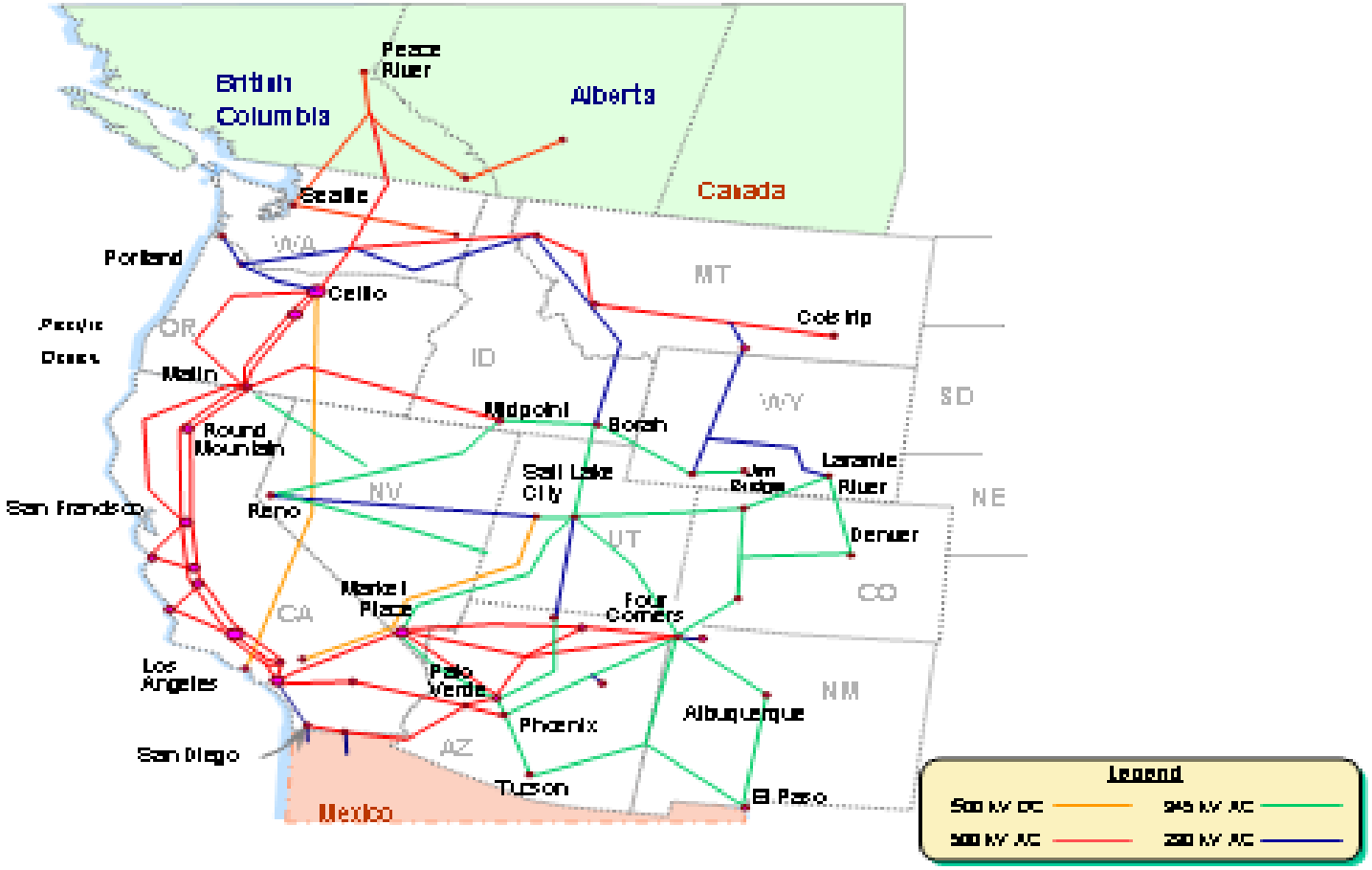
Coal Fuel Price Summary - $/MMBTU

Annual Average Coal Prices

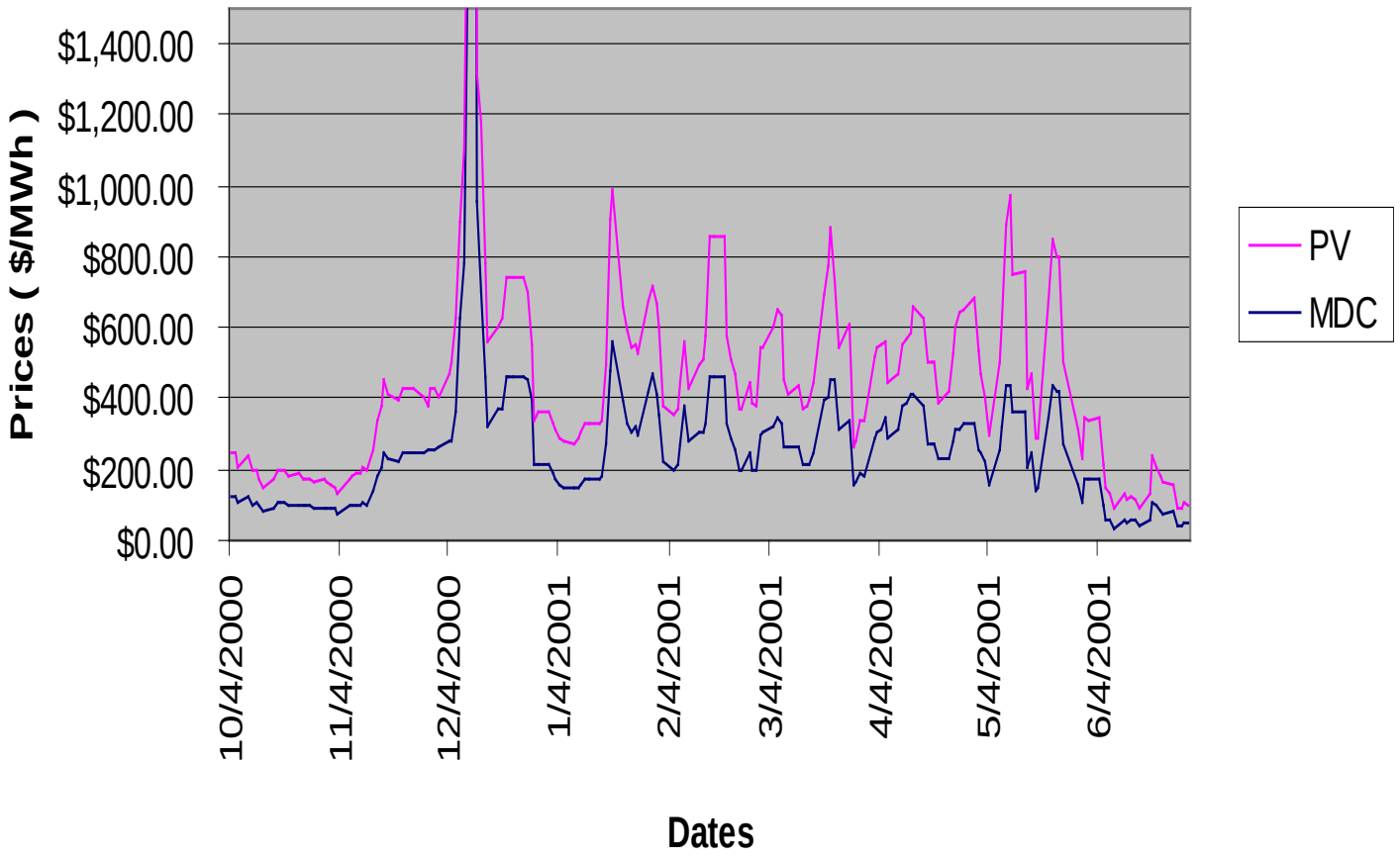


	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
NAVAJO	0.98	1.00	1.02	1.05	1.06	1.07	1.09	1.20	1.19	1.12	1.07	1.15	1.13	1.31	1.22	1.20	1.31	1.45	1.47
F CORNERS	1.03	1.05	1.06	1.13	1.10	1.19	1.14	1.25	1.14	1.00	1.00	1.08	1.08	1.20	1.22	1.29	1.36	1.49	1.55
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

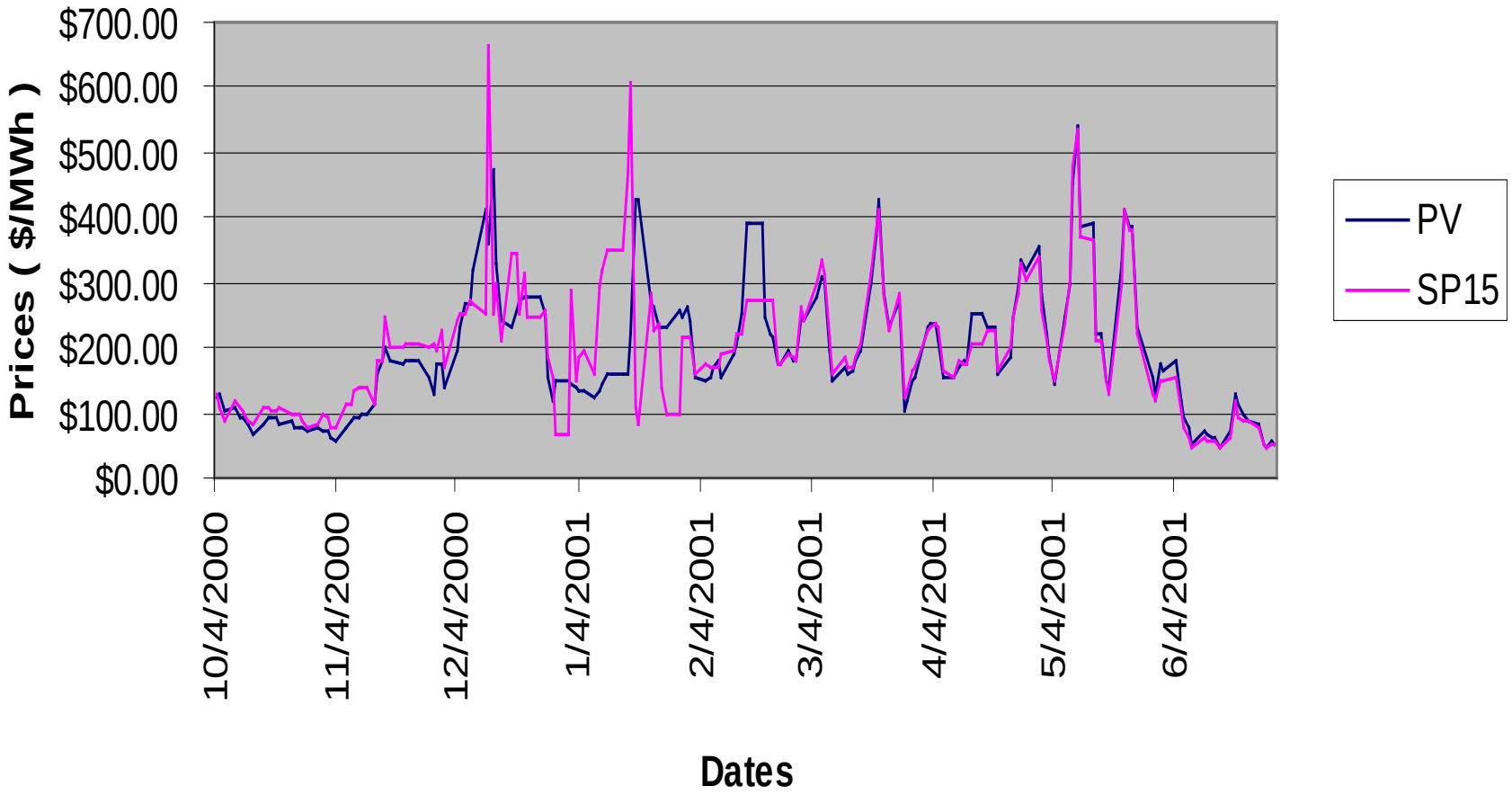
Western Transmission Grid



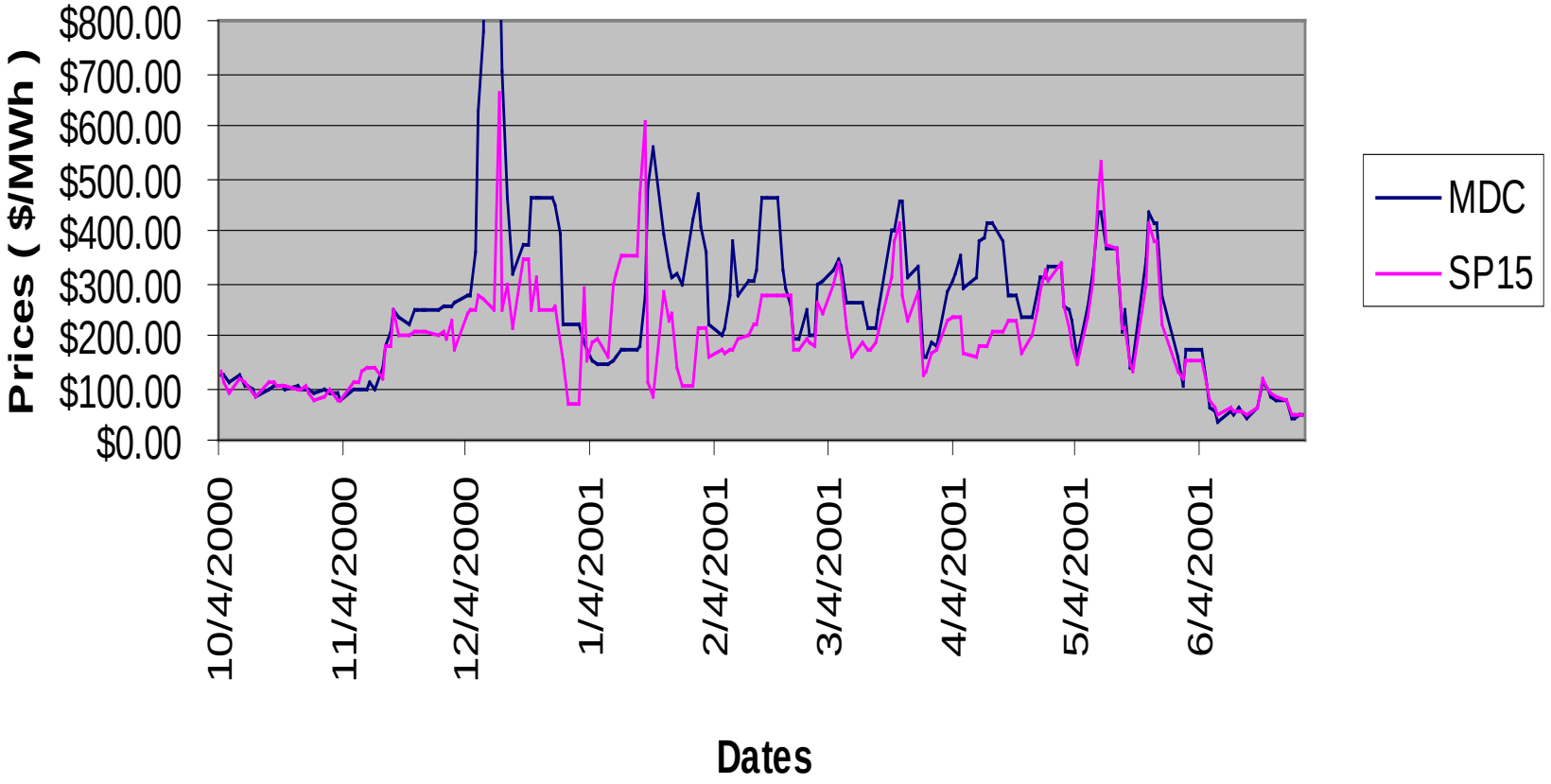
Palo Verde / MIDC Power Prices During the Energy Crisis 2000-2001



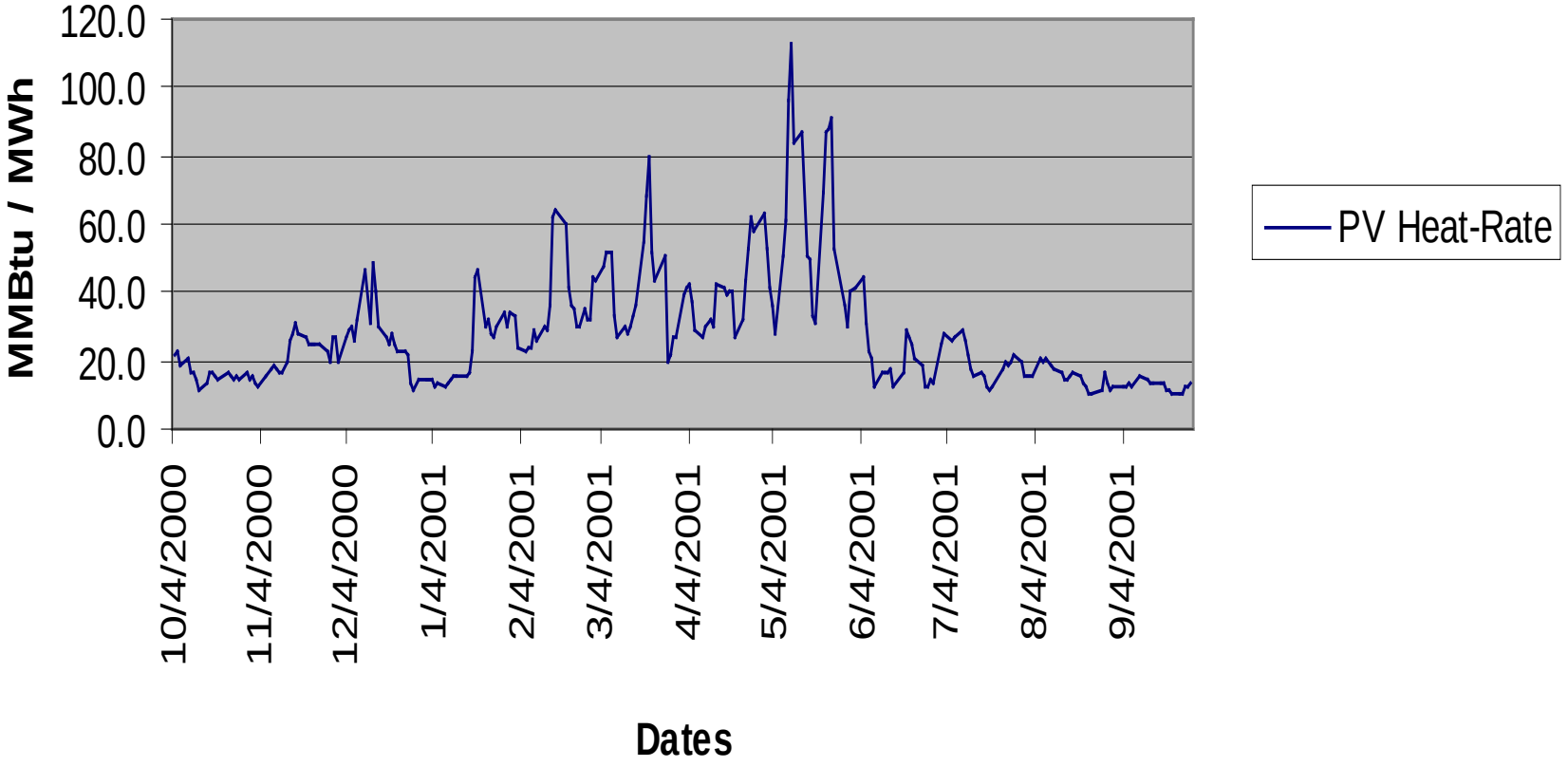
Palo Verde / SP15 Power Prices During the Energy Crisis



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



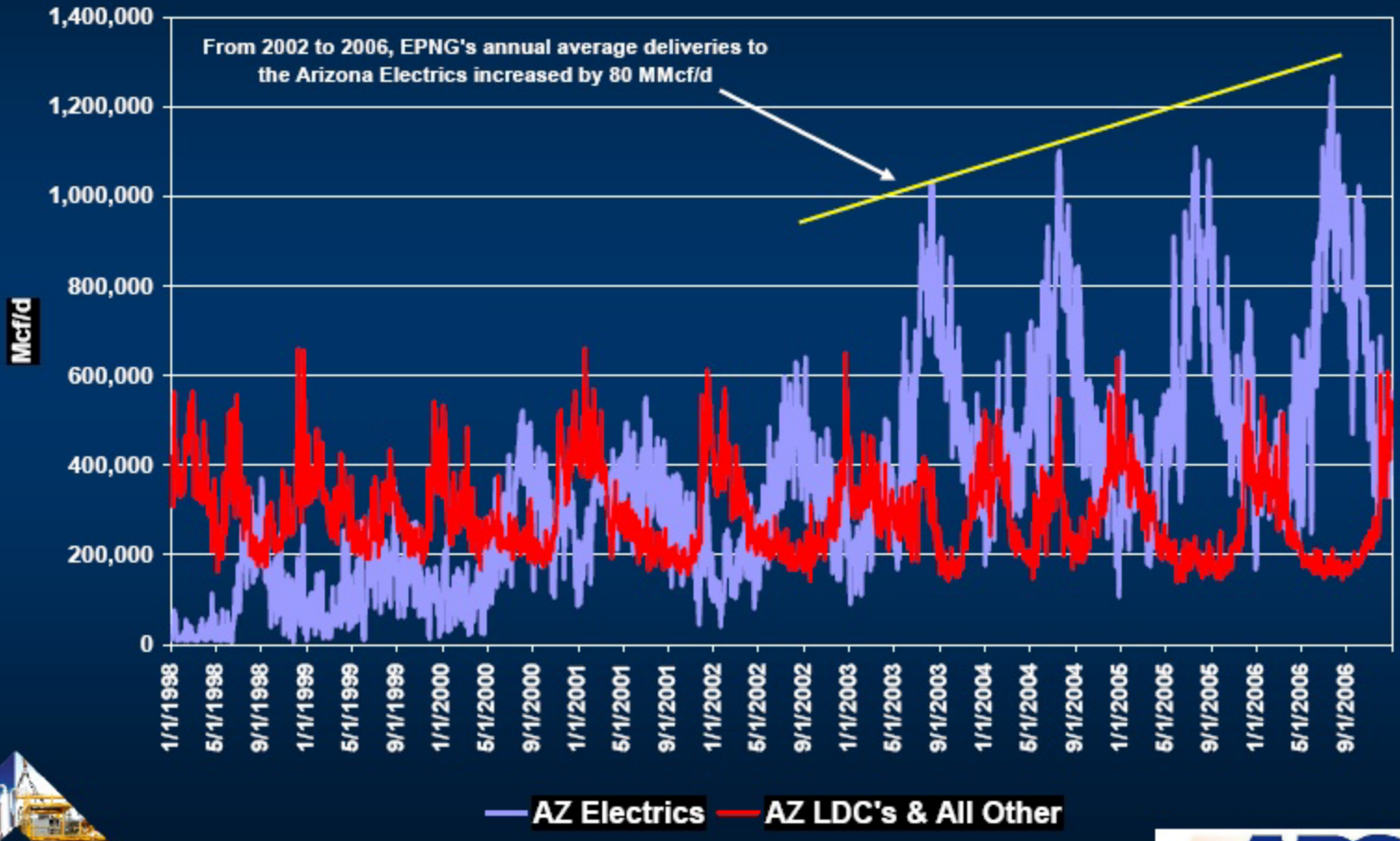
Palo Verde Effective Market Heat-Rate During the Energy Crisis; 2000-2001



Natural Gas Fueled Electric Generation Capacity in Arizona

EPNG Daily Deliveries to Arizona

January 1998 thru December 2006



2009 Load/Resource Balance for Native Load

				Summer	15%			Non-Summer	12%							
Month	Jan-09	Feb-09	Feb-09	Mar-09	Apr-09	May-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Sep-09	Oct-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%
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
Reserves [1]	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**
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
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
Gas 10000 <> 13000	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
Existing Renewables	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
Planned Max Capacity on Maintenance	(737)	(964)	(1,268)	(1,377)	(1,430)	(1,425)	(896)	-	-	-	-	-	(551)	(1,004)	(1,380)	(382)
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**
LONG-TERM CONTRACTS																
SRP Territorial	172	172	172	172	172	172	172	176	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
Pac Exchange	(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
Morgan & PNM						150	150	650	650	650	650	425	150	150		
Renewable Res, ComV & Other Renew	41	41	41	66	66	78	81	56	56	56	58	58	59	59	59	59
Yuma, Other Ct's	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96
Mkt Purchases (economic energy rqmt)	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
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**
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
Implied Reserve Margin	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

APS Hedging Program

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)

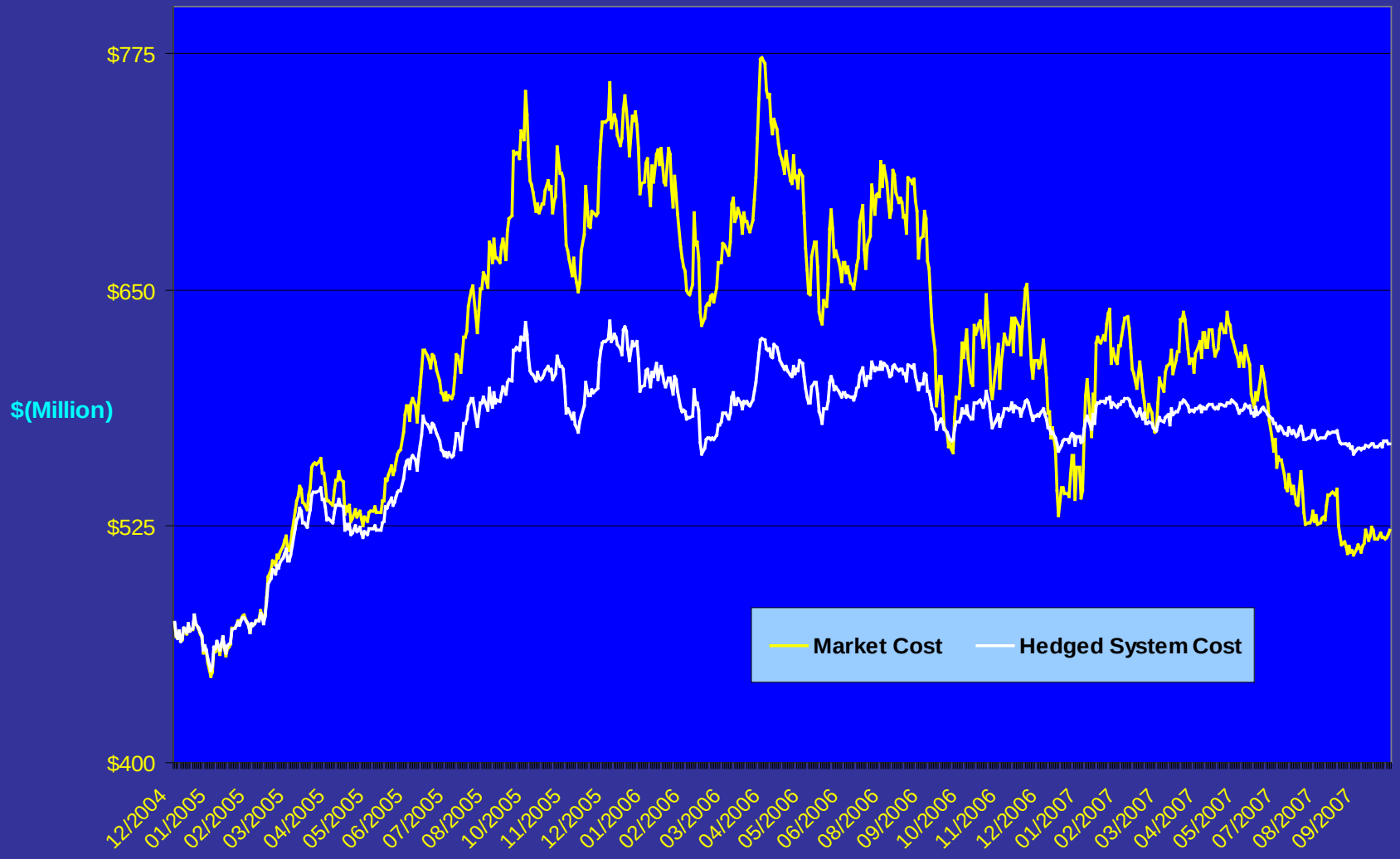
	Years 2009 - 2012												
Total Energy	**Q2'09**	**Q3'09**	**Q4'09**	**Q1'10**	**Q2'10**	**Q3'10**	**Q4'10**	**Q1'11**	**Q2'11**	**Q3'11**	**Q4'11**	**Q1'12**	**Q2'12**
Hedge Percent Requirement[1]	85%	85%	85%	85%	85%	50-60%	50-60%	50-60%	50-60%	30-40%	30-40%	30-40%	30-40%
Current Hedge Percent	83.5%	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**

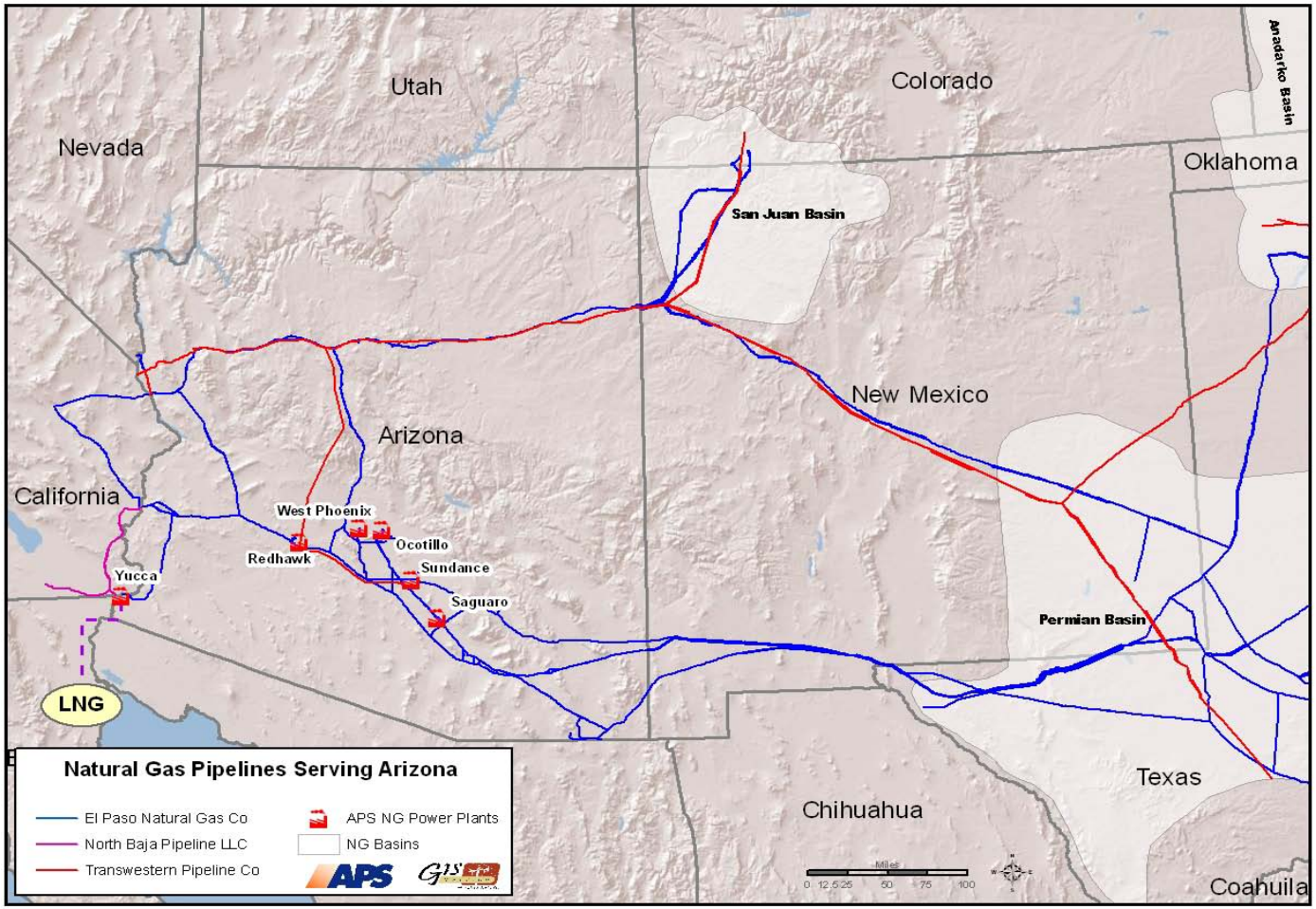
[1] - 85% hedge has a tolerance band of +/- 2 percentage points.

[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.

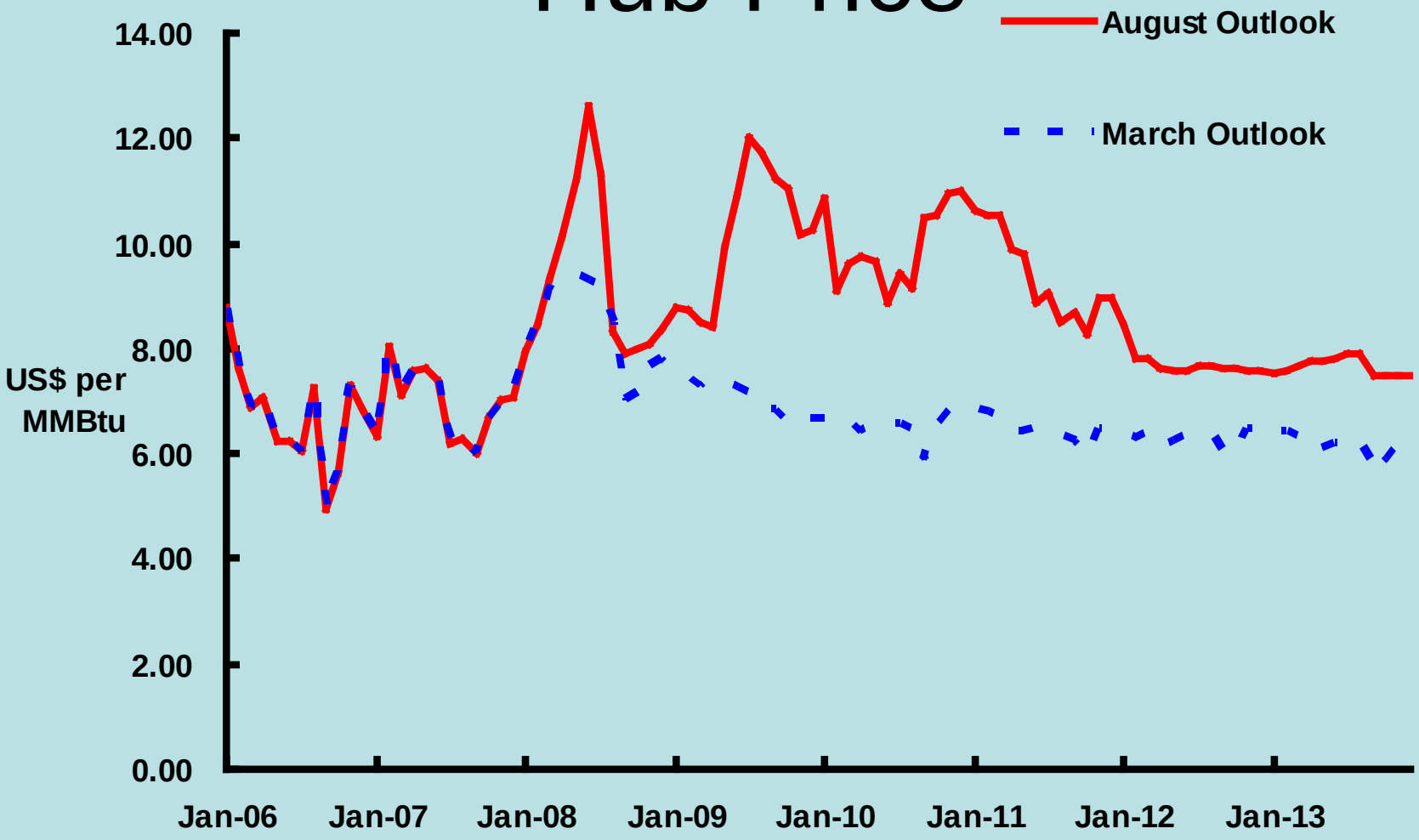
APS System Hedge Report
Comparison of Hedge Costs to Market



Natural Gas Pipelines Serving Arizona



Changing Outlook for Henry Hub Price



Source: Cambridge Energy Research Associates.