Benchmarking Study
of Arizona Public Service Company's
Operations, Cost, and Financial Performance
Docket No. E-01345A-08-0172

FINAL REPORT SUPPORTING ANALYSIS

Presented to:

Arizona Corporation Commission
Utilities Division

Presented by:

The Liberty Consulting Group

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APS Benchmarking Analysis

Exhibit I

Safety

THE LIBERTY CONSULTING GROUP

Safety

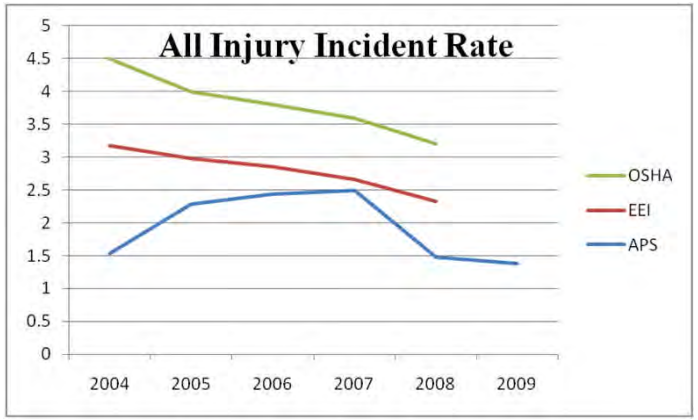
Benchmarking Variables

- The benchmarking data available was:
  - EEI data offered by APS
  - Published OSHA data for “electric power generation, transmission and distribution”
- The single parameter offered is the injury and illness incidence rate
- Incident rates are measured by incidents per 200,000 worker hours, which on an annual basis equates to incidents per 100 workers

Safety

Injury Statistics

- Superficially, the limited data from OSHA and EEI suggests APS compares favorably
- But the data is simply too sparse to reach anything but the most basic conclusions



- Differentiators that would represent likely differences, such as regional weather impacts, would be of particular interest, but they are not available
- The favorable position of APS in this basic data suggests that there is no compelling reason to search for more information or clarifying data.

Safety

Recommendations

- **None**

- The benchmarking analysis of the safety data offers no indication that further analysis is warranted

- While efforts to improve performance may always be appropriate, there are no such actions resulting from this analysis

APS Benchmarking Analysis

Exhibit II

Customer Satisfaction

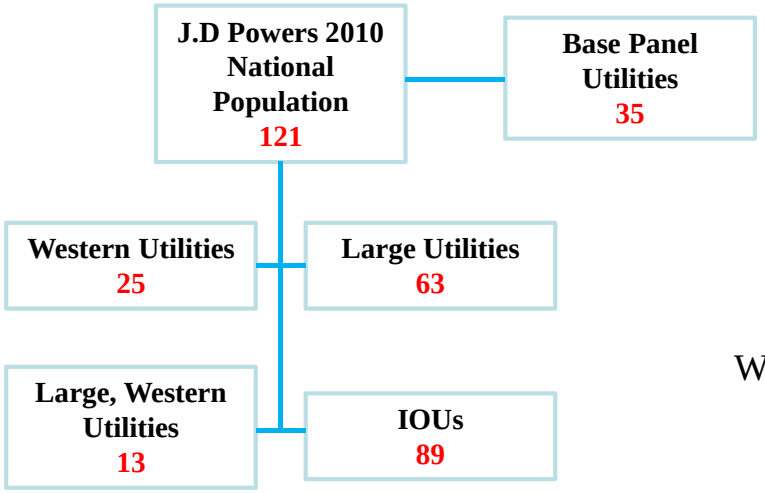
Customer Satisfaction

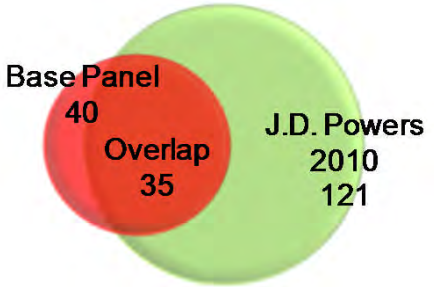
The J.D. Powers Survey

- J.D. Powers and Associates is the foremost name in customer surveys in the U.S.
- They expanded into the electric utility space about 10 years ago
- Reliable and consistent data is available for the last 5 years, although study participants have changed during that time
- The study is very well supported by the industry, with 121 firms participating in 2010
- The study measures residential customer satisfaction with electric utility companies by examining six key factors:
  - power quality and reliability;
  - price;
  - billing and payment;
  - corporate citizenship;
  - communications; and
  - customer service.

Customer Satisfaction Panels

- In addition to the foundational base panel for the APS benchmarking study, Liberty employed five additional panels





We have a strong array of panels from which to choose.

Customer Satisfaction

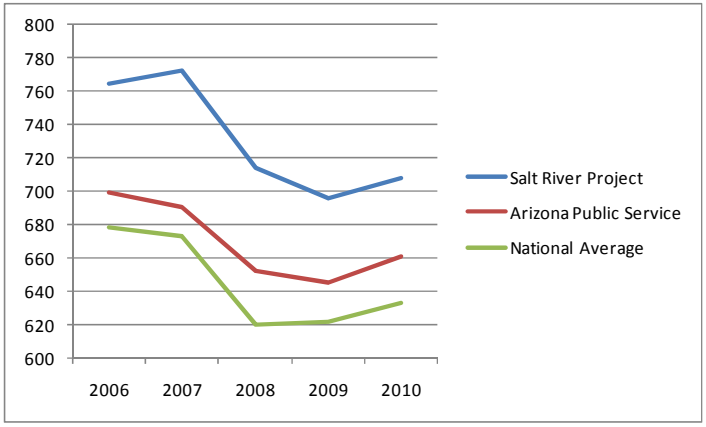
Summary Results

Panel	Utilities	APS Rank	Percentile	Panel Average	APS Rating
Liberty Base / JDP Nexus	35	4	11%	639	661
JDP National	121	19	16%	633	
JDP National - IOUs Only	89	4	4%	626	
JDP National - Large Only	59	8	5%	629	
JDP - West	25	9	36%	654	
JDP - Large, West	13	4	31%	651	

- **APS is in the upper percentiles**
  - In the top 11th percentile in our base panel
  - In the top 5% of IOUs and large utilities
  - APS drops, but is still above average, when confined to western comparisons

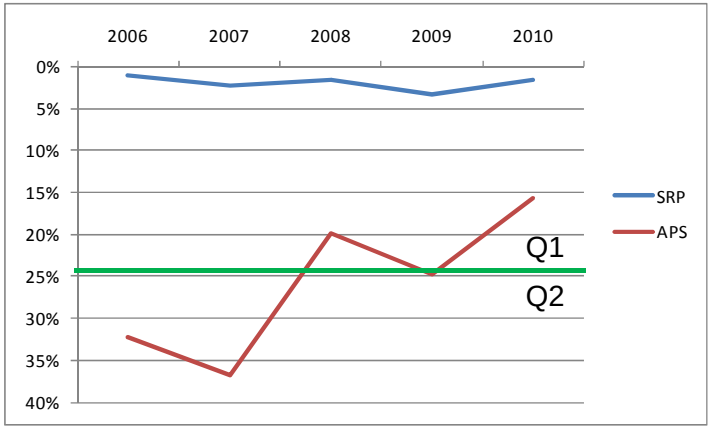
Customer Satisfaction

Trends



Trend in Customer Satisfaction Index

- The general trend in customer satisfaction has been down
- Both APS and SRP have mirrored the national trend

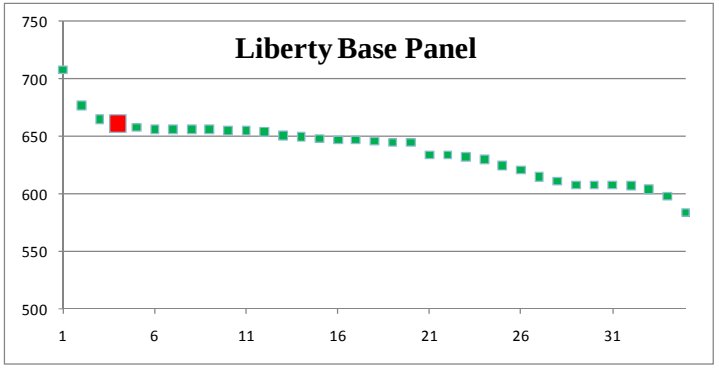


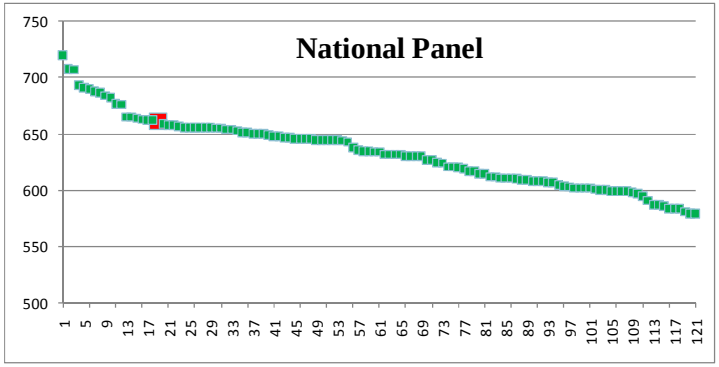
Trend in Relative Ranking

- But the national trend masks a real improvement by APS, whose ranking has risen impressively in the last 4 years from mid 2Q to 1Q

Customer Satisfaction

APS Ranks in the Upper Segments



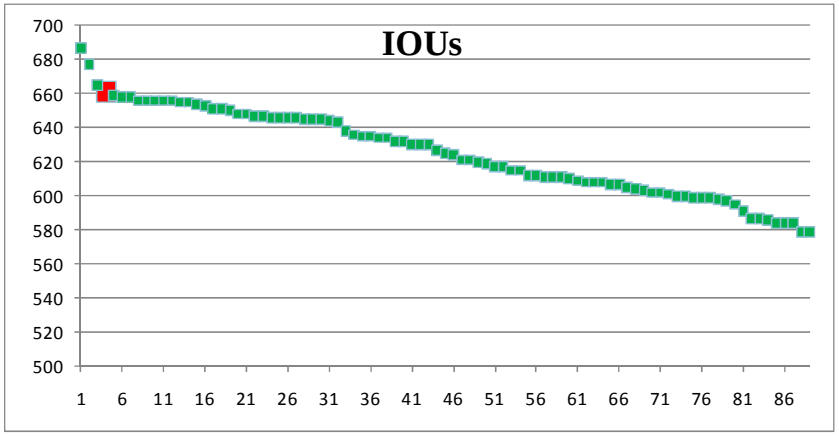


- APS ranks near the top of the base panel, which is the most comparable panel for this benchmarking study
- While the sharp rise in the curve to the left of APS suggests extraordinary performers (including SRP), there is no denying the excellent standing of APS.

- On a much larger nationwide panel, APS still exhibits a very strong standing, just short of the extraordinary performers, but well ahead of the rest of the pack.

Customer Satisfaction

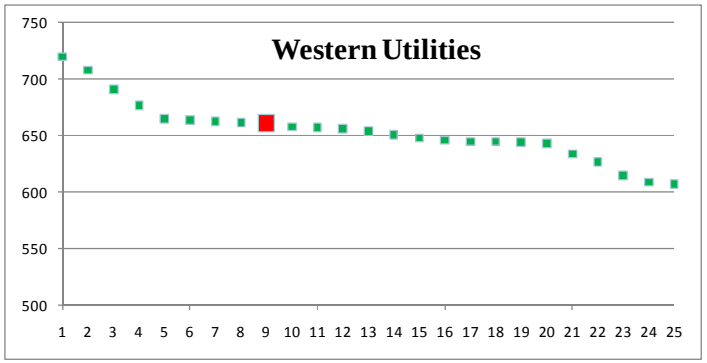
APS Especially Stands Out Among IOUs

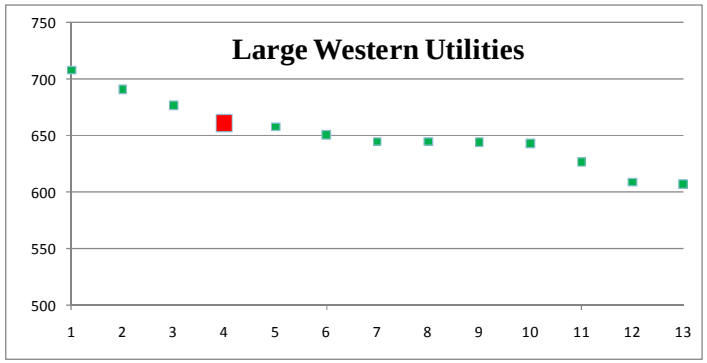


- Only three IOUs surpass the APS rating
- On a national basis among all utilities, 15 of the 18 rated higher than APS are public power
- This begs the question as to what might be learned from public power, including SRP
- In any event, from a customer satisfaction perspective, APS resembles public power more than it does an IOU

Customer Satisfaction

Higher Standards in the West





- When the panel is limited to western utilities, APS remains well above average but no longer enjoys a top decile type of ranking
- The fact that performance is still well above average in this “tougher crowd” is a positive.

- Narrowing the western panel to only the large utilities (>500,000 residential customers), improves the APS position somewhat.

Summary of Observations

- By any measure, APS ranks high when benchmarked among peers in customer satisfaction.
- APS's recent improvement trend suggests that the company has a plan, and it is working.
- SRP's performance far exceeds APS (and nearly everybody else). While that is nothing to be concerned about, one should seek an understanding of what their source of success is.

Recommendations

- **None**

- The benchmarking analysis of the customer satisfaction data offers no indication that further analysis is warranted

- While efforts to improve performance may always be appropriate, there are no such actions resulting from this analysis

APS Benchmarking Analysis

Exhibit III

Reliability

Reliability

Panel and Data Availability

- APS provided, for 2004-2008:
  - Actual APS results – SAIDI, SAIFI, CAIDI and MAIFI
  - Industry averages
  - Both with and without major events
- Liberty obtained, for 2003-2008:
  - Industry performance by quartile - SAIDI, SAIFI and CAIDI
  - Excluded major events and outages <5 minutes per IEEE

- Benchmarking analyses are limited by:
  - Only bulk data available – not utility-specific (other than APS)
  - Urban/rural, overhead/underground, vegetation/desert are examples of critical differentiators that are unavailable
  - Regional differentiation is also important but unavailable
  - Regulatory treatment may also have an impact – about a dozen states have reporting requirements with formal consequences for poor reliability performance

Reliability Indices

- SAIFI
  - System Average Interruption Frequency Index

$$\frac{\text{Customer interruptions per year}}{\text{Customers served}}$$

Number of interruptions an average customer sees in a year

- SAIDI
  - System Average Interruption Duration Index

$$\frac{\text{Customer interruption durations (min/year)}}{\text{Customers served}}$$

Number of interrupted minutes an average customer sees in a year

- CAIDI
  - Customer Average Interruption Duration Index

$$\frac{\text{Customer interruption durations (min)}}{\text{Customer interruptions}}$$

Number of minutes an average interruption lasts

- MAIFI
  - Momentary Average Interruption Frequency Index

$$\frac{\text{Customer momentary interruptions per year}}{\text{Customers served}}$$

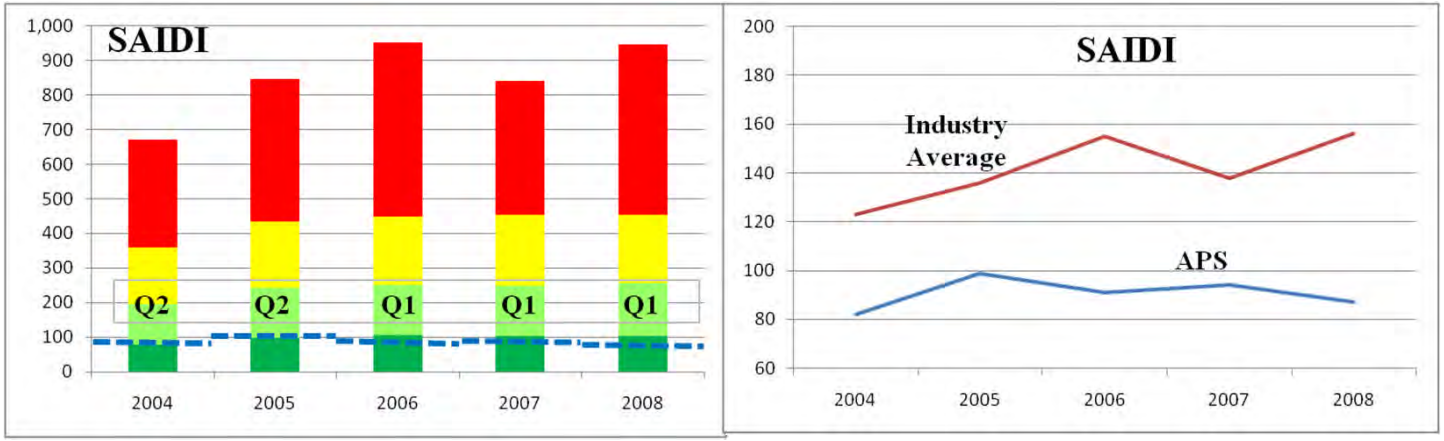
Number of momentary interruptions an average customer sees in a year

Reliability

Number of interrupted minutes an average customer sees in a year

SAIDI

APS is top quartile



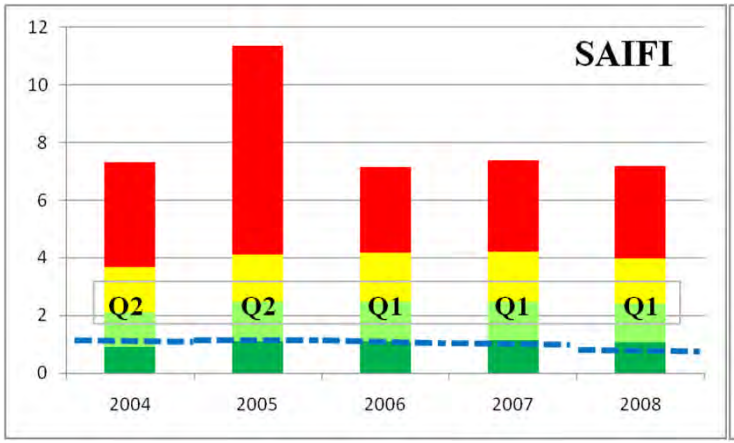
- The average customer experiences about 87 minutes of outages per year, or 99.98% reliability
- APS is consistently around the top quartile mark and has been Q1 for the last 3 years
- APS has had consistent performance, while the industry performance has declined significantly
- This index captures both frequency of outages and restoration performance.
- The APS results are generally as expected given the milder weather of the region compared to other states

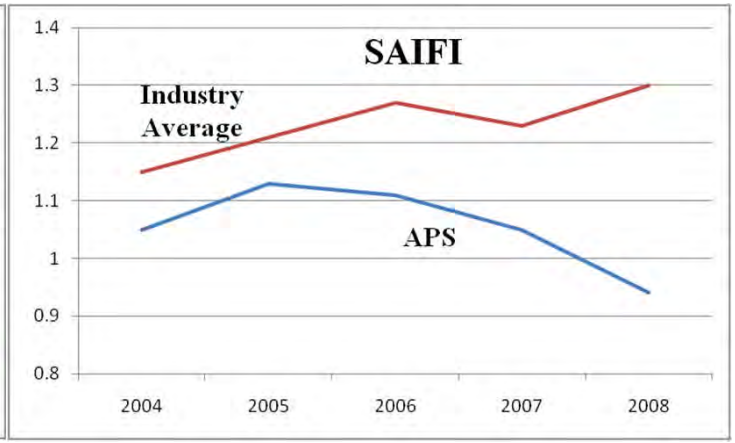
Reliability

Number of interruptions an average customer sees in a year

SAIFI

APS is top quartile





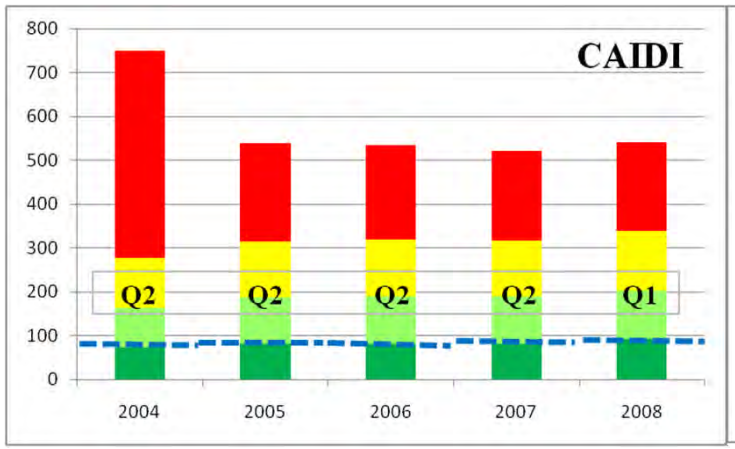
- The average customer experiences 1 outage per year
- APS is consistently around the top quartile mark and has been Q1 for the last 3 years
- APS performance has improved in each of the last 3 years
- Industry performance has deteriorated significantly

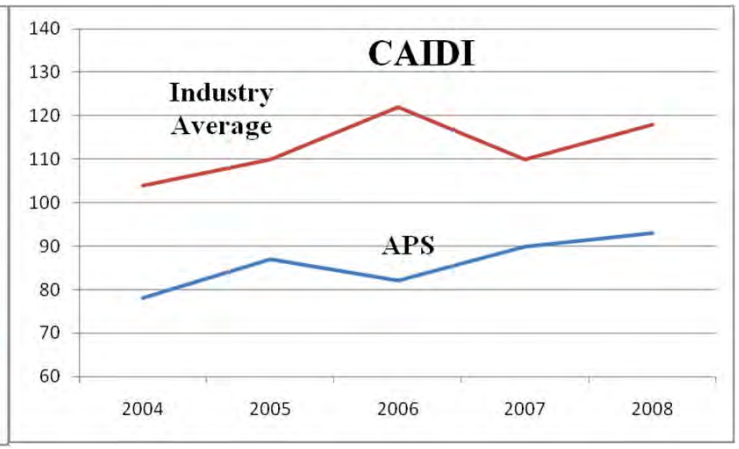
Reliability

Number of minutes an average interruption lasts

CAIDI

APS is top quartile





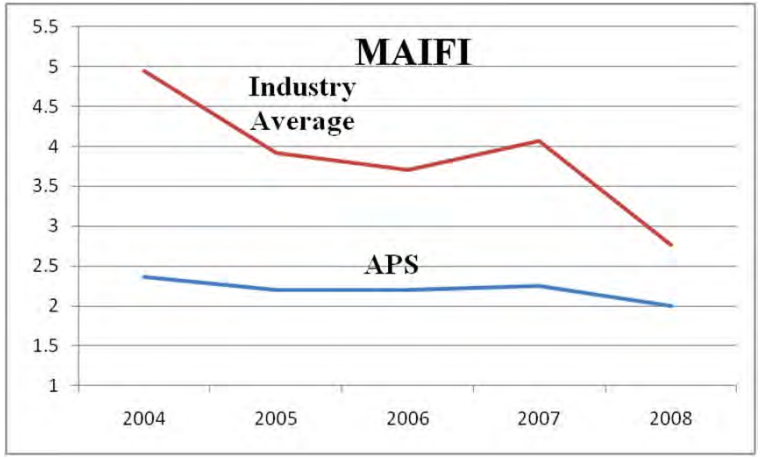
- An average APS outage lasts about 90 minutes
- APS is consistently around the top quartile mark and rose to Q1 in 2008 (or more precisely the Q1 standard dropped)
- Both APS and industry performance has been declining in recent years
- This is primarily a measure of restoration performance

In summary, a customer experiences 1 outage per year of ~90 minutes

Reliability

Number of momentary interruptions an average customer sees in a year

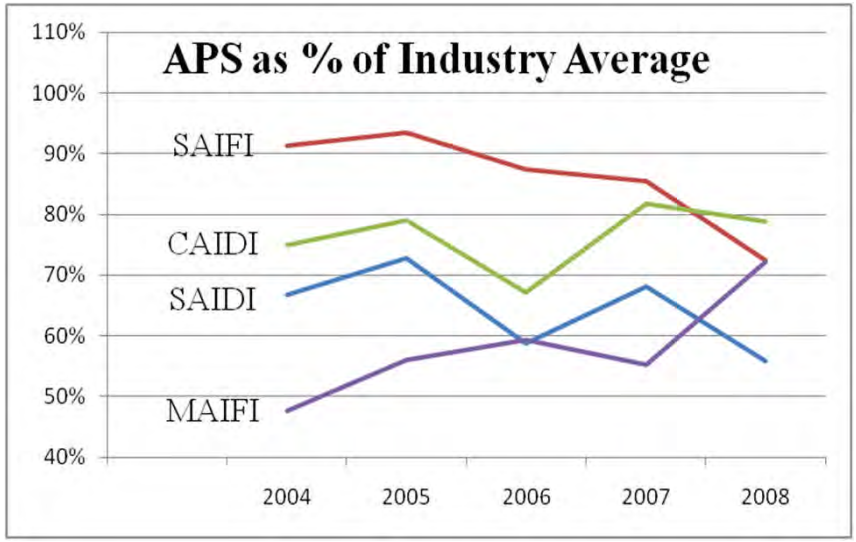
MAIFI



- MAIFI is an increasingly important measure, but one with less historical data available
- Although easier to measure (from breaker and recloser counters), the data may be less reliable at this point
- The industry trend above, counter to all other indices, is questionable
- APS performance has been steady and is still well under the industry, despite the significant industry improvement

Reliability

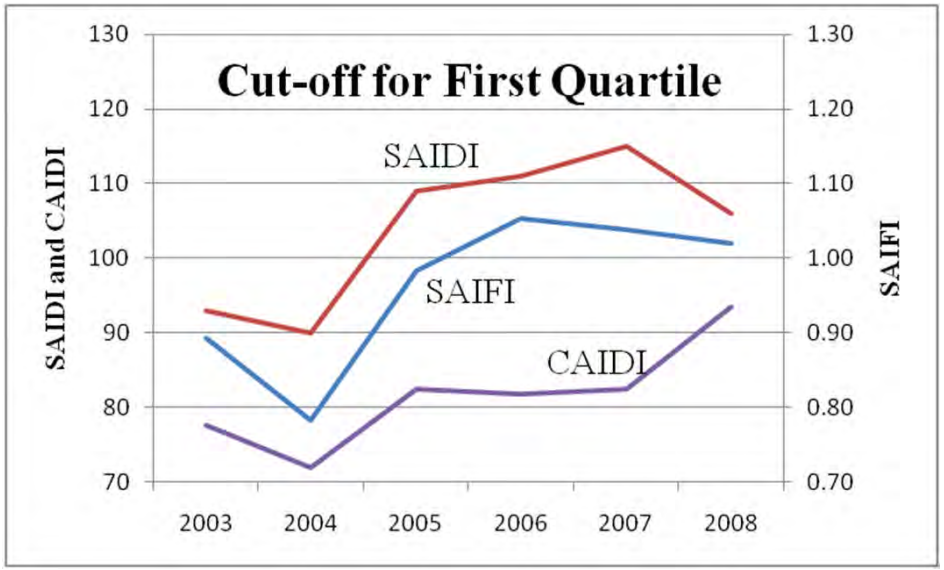
APS versus Industry



- APS interruptions have consistently been a fraction of the industry average
- APS has also improved its position vis-à-vis the industry except for MAIFI, which is probably attributed to incorrect industry data

Reliability

An Easier Target



- The industry "standard" for first quartile performance has been steadily drifting up
- This is likely the effects of lessened industry spending for distribution, which has only recently started to recover
- Simply said, it is now easier to qualify for Q1 (although that should not diminish the achievement)

Reliability

Major Events

- All of the data presented so far excludes major events
- If major events are included, APS's relative performance improves further
  - This should be expected since there will be far fewer major events in AZ

APS as a % of Industry Average (2004-2008)		
	Incl Major Events	**Excl Major Events**
SAIDI	29%	64%
SAIFI	79%	86%
CAIDI	49%	76%
MAIFI	55%	58%

Reliability

Summary of Observations

- APS performance is borderline Q1 in all categories
- The average duration of an outage is getting longer for APS, suggesting a review of restoration capabilities
- The lack of utility-specific data precludes normalization for region
- There is no reason to pursue reliability improvements based solely on these benchmarking results
- The industry trend in reliability is poor, probably due to reduced distribution spending in the 90s

Reliability

Recommendations

- **No major recommendations**

Recommendation 3.1: Although not an issue of significant concern, APS may wish to examine the upward drift in restoration times, as measured by CAIDI.

APS Benchmarking Analysis

Exhibit IV

Base Load Coal Performance

Base Load Coal Performance

Benchmarking Variables

- Operational Performance – by unit
  - Unit capacity factor (CF)
  - Equivalent Availability Factor (EAF)
  - Equivalent Forced Outage Rate (EFOR)

    The term “equivalent” simply means that de-rates are included proportionately as outage time

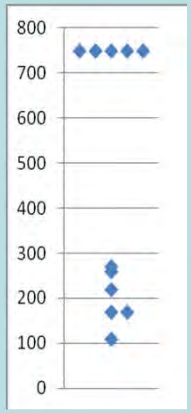
- Power Plant Costs – by power plant
  - Fuel
  - Non-fuel O&M

Generation costs are discussed more fully later, by Company. This analysis is focused on specific power plants belonging to the expanded panel companies.

Base Load Coal Performance

Panel Development

- The Liberty expanded panel (including E&G utilities) is used
- Only units falling into two size categories are considered
- Only units with CF > 60% are considered in the Liberty panel



APS unit sizes

- APS coal units fall into two categories
  - Large ~750 MW
  - Small ~100 – 300 MW

- Designer Panels (SNL)

Coal-fired Plants → **>60% Capacity Factor** → **Operated by Expanded Base Panel Member** → **Large 600-1,000 MW** → **68 units**

Operated by Expanded Base Panel Member → **Small 100-300 MW** → **98 units**

- Bulk Panels (GADS)
  - Large – 600-1,000 MW – **141 units**
  - Small – 100-300 MW – **195 units**

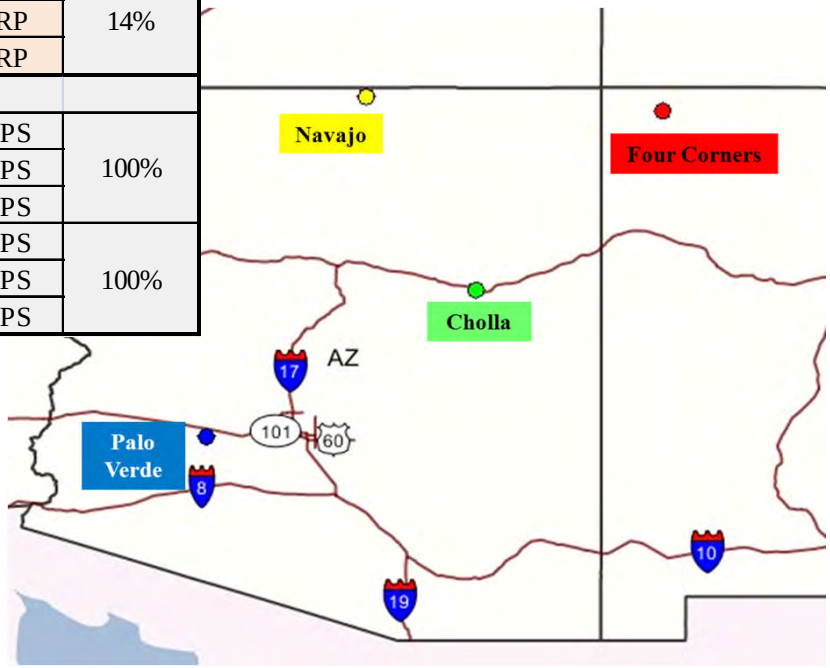
GADS panels combine various size groups as required

Base Load Coal Performance

APS Base Load Coal Units

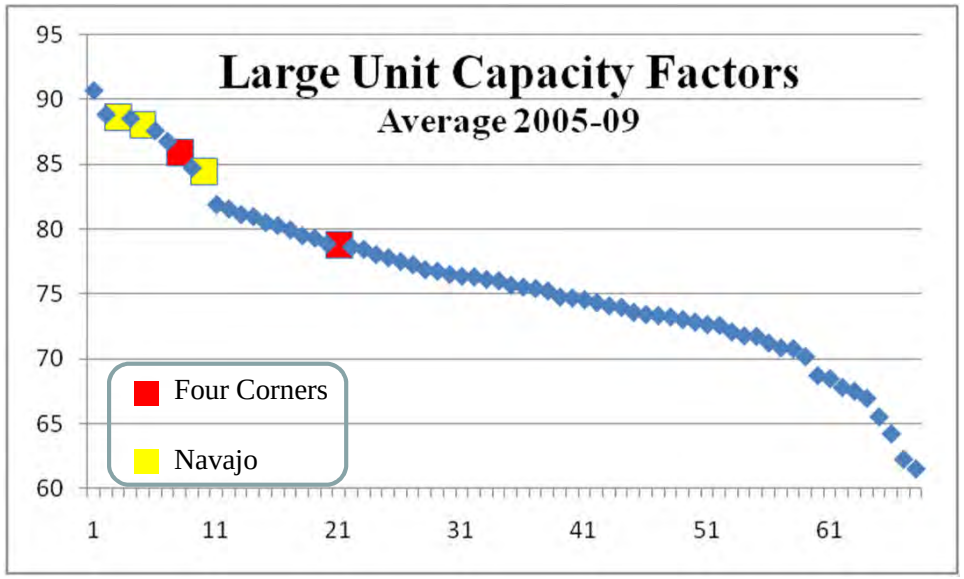
	APS Base Load Coal Units				
	Unit	Capacity	Age	Operator	APS Share
Large Units					
Four Corners	4	750	41	APS	15%
	5	750	40	APS	
Navajo	1	750	36	SRP	14%
	2	750	35	SRP	
	3	750	34	SRP	
Small Units					
Four Corners	1	170	47	APS	100%
	2	170	47	APS	
	3	220	46	APS	
Cholla	1	110	48	APS	100%
	2	260	32	APS	
	3	271	30	APS	

- There are 11 units, 5 large and 6 small
- 3 are operated by SRP
- The large units are only partially owned
- Youngest units are about 30 years old
- Several units are nearly 50 years old



Base Load Coal Performance

Large Unit CF

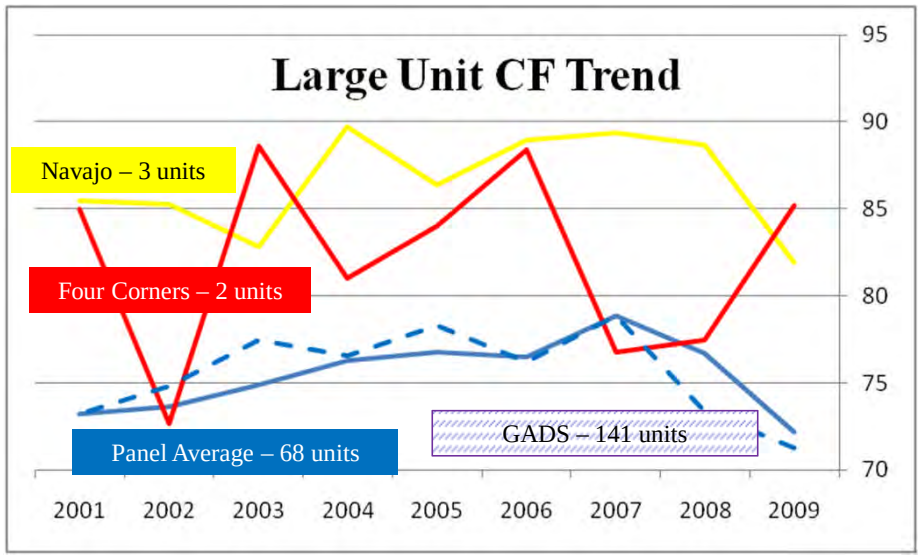


- The Navajo units have been among the top quartile producers in the country
- Four Corners #4 enjoys the same stature, while #5 is not far behind
- Navajo 1-3 and FC 4 make up 4 of the country's top 10 performers

- The marked separation between the top 10 and the rest of the population makes this level of performance even more impressive

Base Load Coal Performance

Large Unit CF Trends

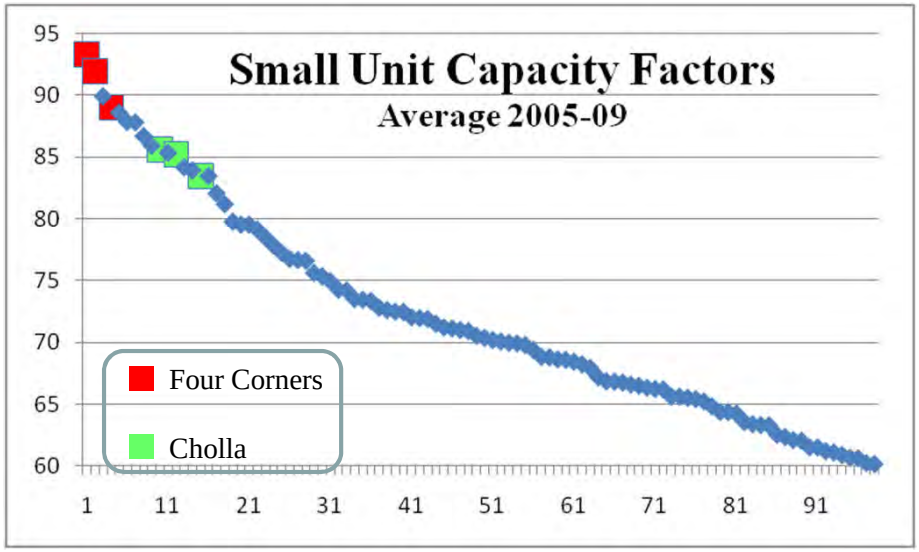


- The trend shows Navajo consistently above the industry
- Four Corners has not been quite as strong, with the notable drops attributable to Unit 5
- The drop in 2009 for Navajo is attributable to a 65% for Unit 3

- On a national basis, performance has consistently improved until the economically driven downturn in 2008

Base Load Coal Performance

Small Unit CF



- The Four Corners units (1-3) occupy 3 of the top 4 positions in he country
- The 3 Cholla units were also all strong performers, in the first quartile and on the extraordinary part of the curve

- With two units nearing 95% while no one else is above 90%, the Four Corners data looks “too good to be true”, and that is indeed the case

Digging Deeper

- A closer examination of Four Corners data suggests that the reported operating capacity of the small units, and hence the basis for calculating capacity factor, is too low
- There were 11 unit-months over 100% CF in 2009 for Four Corners 1-3
- There was only 1 unit-month slightly over for all 8 other units
- It is therefore not unreasonable to conclude that the FC 1-3 capacity factors are overstated by perhaps 5% or more
- A suitable adjustment would lower the performance of the units, but not much

Four Corners 1-3 2009 Monthly Capacity Factors

	# of months with CF>100%	Top monthly CF
FC 1	3	102.71%
FC 2	6	102.64%
FC 3	2	101.19%

Other Units 2009 Monthly Capacity Factors

	# of months with CF>100%	Top monthly CF
FC 4	0	96.14%
FC 5	0	99.55%
Cholla 1	1	100.01%
Cholla 2	0	95.63%
Cholla 3	0	94.05%
Navajo 1	0	97.22%
Navajo 2	0	97.63%
Navajo 3	0	98.84%

Base Load Coal Performance

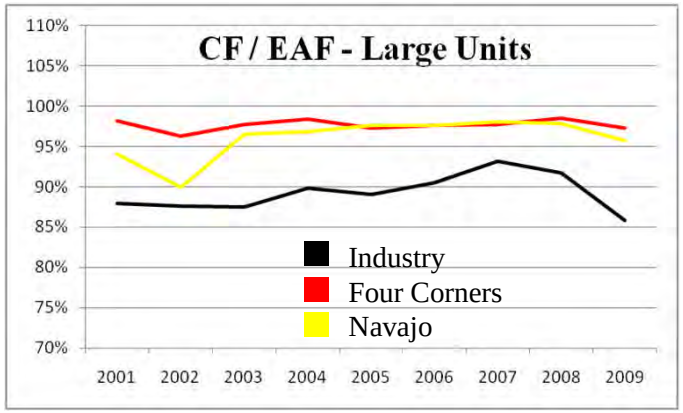
Capacity Factor while Available

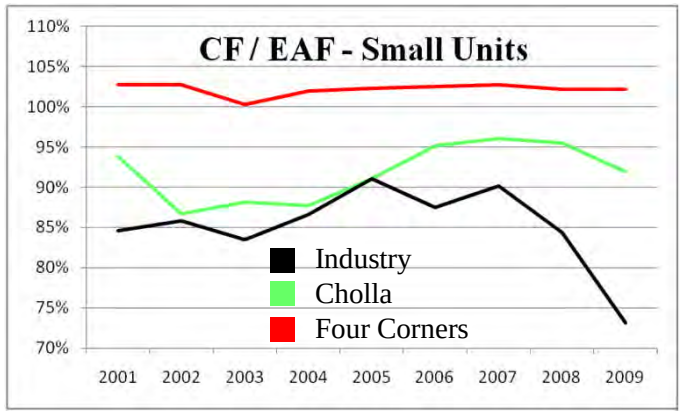
- Measures percentage of output while available

  = CF / EAF

- For FC 1-3, the CF actually exceeds the EAF in virtually every month, again indicating that the CF is overstated, probably even more than the 5% suggested previously
- Note again the sharp drop in small units in 2008-09 due to the economy and perhaps higher coal costs

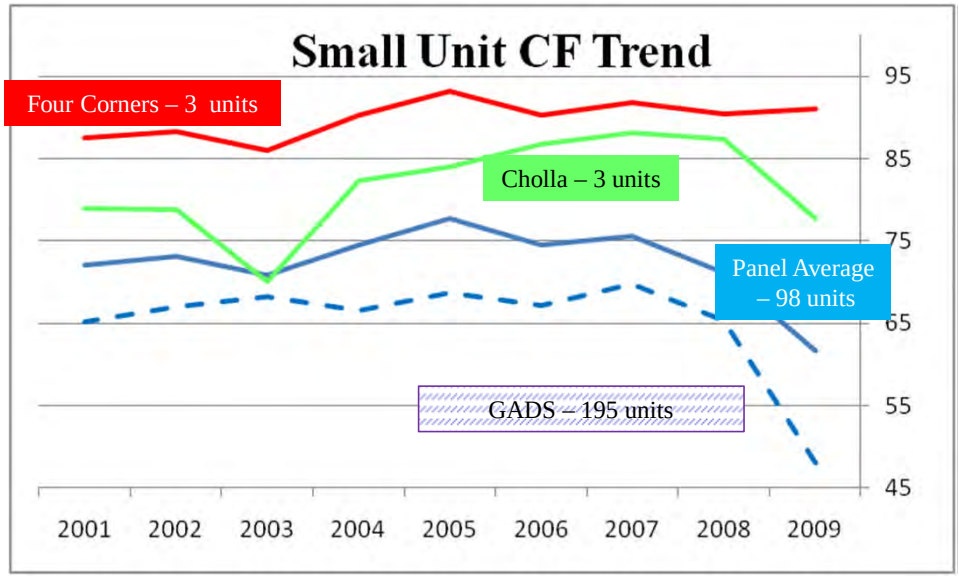
CF / Equiv. Availability		
	10 Year Average	Years above 100%
FC 1	102%	10
FC 2	102%	10
FC 3	102%	9
FC 4	97%	0
FC 5	98%	0
Cholla 1	94%	0
Cholla 2	92%	0
Cholla 3	89%	0
Navajo 1	96%	0
Navajo 2	96%	0
Navajo 3	96%	0
Industry	87%	0





Base Load Coal Performance

Small Unit CF Trends



- Both FC and Cholla have performed consistently above the panel
- If anything, the APS units have improved their standing in the industry

- The drop in demand in 2008-09, coupled perhaps with less dispatch due to higher fuel costs, had a particularly strong impact on the smaller units
- The GADS panel includes many units with CFs of less than 60%, thereby producing a much lower average

Base Load Coal Performance

Large Unit Rankings

Top quartile
2nd quartile
3rd quartile
Bottom quartile

Large Units	Unit	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Four Corners	4	91%	93%	94%	18%	82%	96%	46%	94%	88%	78%
	5	81%	9%	88%	96%	60%	90%	26%	13%	90%	61%
Navajo	1	75%	88%	72%	93%	54%	97%	97%	81%	97%	84%
	2	96%	82%	93%	63%	97%	87%	76%	97%	96%	87%
	3	84%	90%	56%	97%	94%	88%	91%	96%	22%	80%

- The chart shows the APS ranking in unit capacity factor of the 68 large units in the panel; e.g, 83% means the unit is superior to 83% of the panel members
- Navajo performance ranks high - consistently in or near the top 10%
- Four Corners performance is well above average
- Four Corners #5 has had 2 below-average years in the last 3. This bears further study, not because performance is bad, but because it is so out of character with the other units in the last 5 years

Base Load Coal Performance

Small Unit Rankings

Top quartile
2nd quartile
3rd quartile
Bottom quartile

Small Units	Unit	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Four Corners	1	83%	77%	98%	98%	84%	100%	97%	93%	99%	92%
	2	81%	95%	94%	76%	100%	99%	89%	96%	100%	92%
	3	99%	96%	74%	100%	98%	54%	96%	100%	93%	90%
Cholla	1	38%	82%	92%	71%	90%	97%	64%	95%	84%	79%
	2	76%	52%	83%	80%	40%	93%	99%	87%	91%	78%
	3	89%	66%	2%	65%	79%	69%	94%	97%	72%	70%

- The chart shows the APS ranking in unit capacity factor of the 98 small units in the panel; e.g, 83% means the unit is superior to 83% of the panel members
- Four Corners performance ranks high - consistently in the top 10%, due in part to the artificially low capacity
- Cholla averages in the top quartile – well above average performance – with many top 10% performance years

Base Load Coal Performance

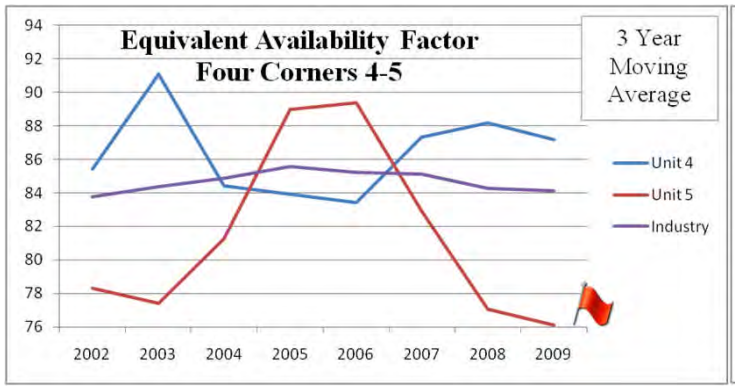
Equivalent Availability Factor

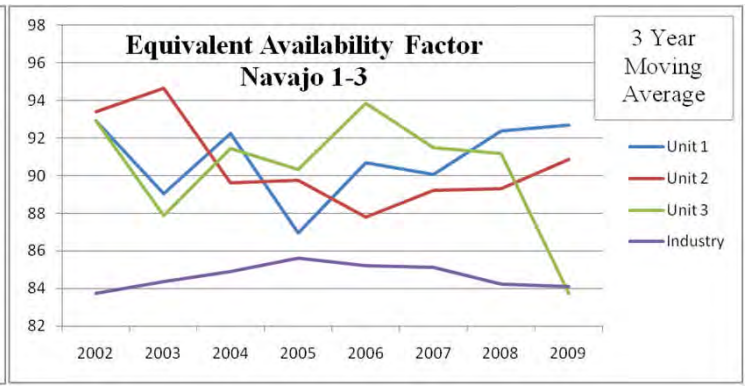
- All APS owned units outperform the industry except for Four Corners 5
- Navajo is especially strong – only recent problems at Unit 3 prevented all three units from exceeding 90% EAF

Equivalent Availability		
	10 Year Average	Years under Industry
FC 1	88%	3
FC 2	89%	2
FC 3	86%	3
FC 4	86%	3
FC 5	82%	4
Cholla 1	88%	3
Cholla 2	90%	3
Cholla 3	87%	3
Navajo 1	91%	2
Navajo 2	91%	1
Navajo 3	89%	2
Industry	85%	NA

Base Load Coal Performance

Large Unit Availability

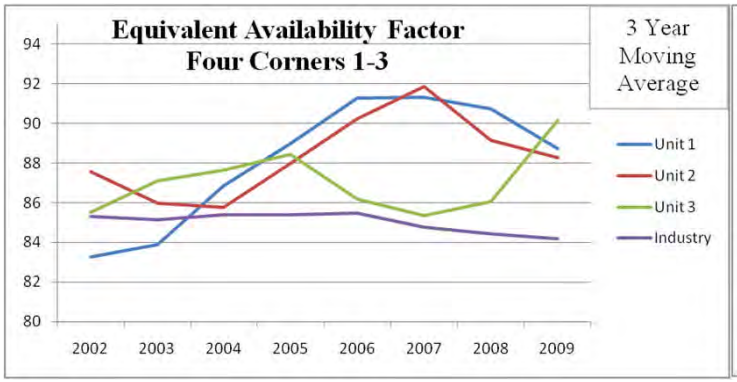


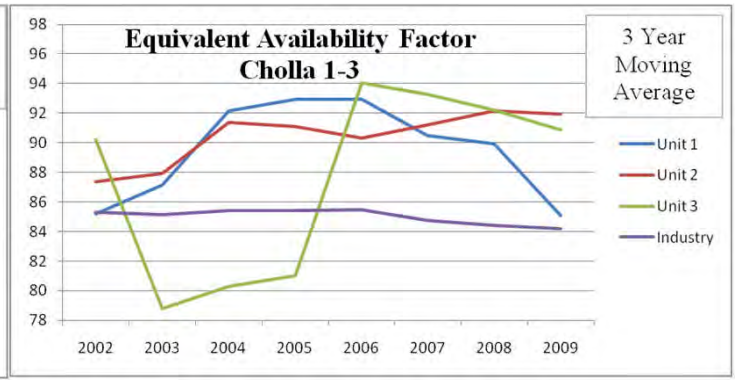


- FC 5 has consistently been well under the industry average on a three year moving average basis
  - the FC units are about 8 years <u>older</u> than the industry average
- All of the Navajo units have been well above the industry except for a recent slip at Unit 3
  - the Navajo units are about the same age as the industry average

Base Load Coal Performance

Small Unit Availability





- The FC units display a positive improvement trend and above average performance
  - the FC units are about the same age as the industry average
- Cholla 1 has declined substantially in recent years
  - Unit 1 is about the same age as the industry average
- Cholla 2 has been improving
- Cholla 3 has a sporadic record with several bad years in 2002-05
  - Units 2 and 3 are about 15 years younger than the industry average

Base Load Coal Performance

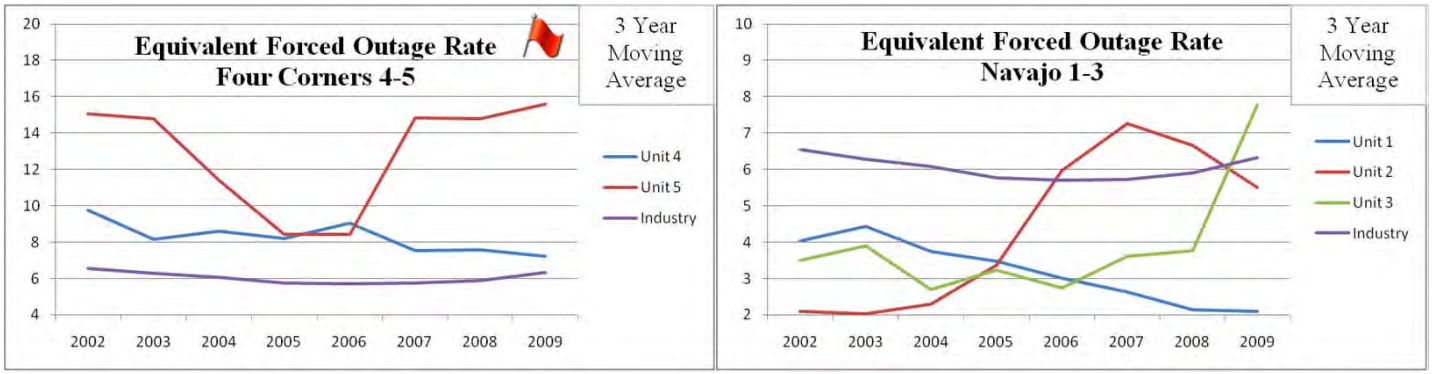
Equivalent Forced Outage Rate

- The APS operated units have forced outage rates worse than industry averages
- It is unusual for any FC unit to beat the industry in any given year
- Navajo, operated by SRP, is well below industry values

Equivalent FO Rate		
	10 Year Average	Years over Industry
FC 1	8.1%	8
FC 2	8.0%	7
FC 3	8.7%	8
FC 4	8.3%	8
FC 5	12.5%	9
Cholla 1	7.8%	5
Cholla 2	5.1%	2
Cholla 3	8.4%	3
Navajo 1	3.1%	0
Navajo 2	4.4%	2
Navajo 3	4.6%	1
Industry	6.3%	NA

Base Load Coal Performance

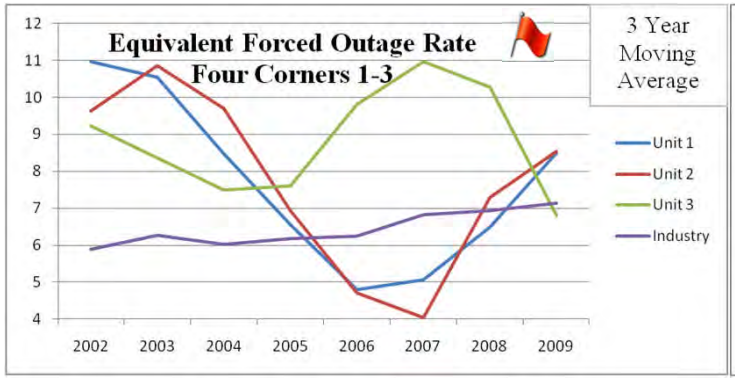
Large Unit Forced Outage Rate

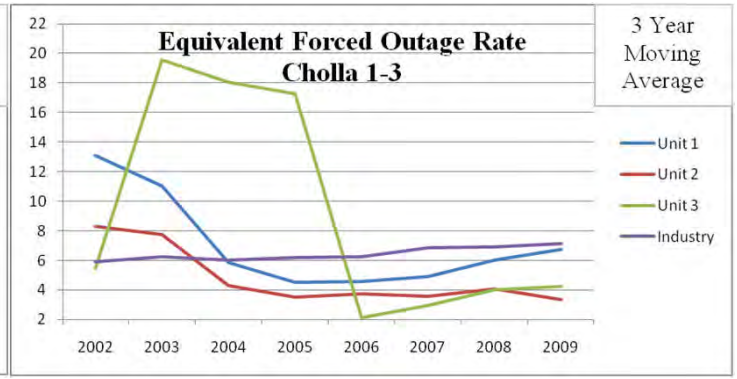


- FC 5 has consistently been well over the industry average on a three year moving average basis
- FC 4 has lagged the industry as well
- Navajo 1 is well below the industry average
- Navajo 2 and 3 appear to have deteriorated sharply in recent years, but are still near industry average

Base Load Coal Performance

Small Unit Forced Outage Rate





- The FC units have had some good years but generally are above the industry average
- Cholla has been near or below the industry except for some very bad years for Unit 3 during 2002-05

Analysis of EFORs

- We have focused on the Four Corners station as having especially high forced outage rates
- APS points out that FC coal is of very poor quality (a trade-off against low cost) and this is the cause of higher than industry forced outage rates
- In seeking validation of this hypothesis, Liberty sought supporting analysis
  - A formal request to the company produced no appropriate supporting analysis
  - A subsequent meeting with the company revealed a very recent benchmarking study of APS power plants by Scott Madden. While this study confirmed higher than peer boiler outages, presumably as a result of bad coal, it also cited some other higher than peer non-fuel related causes
  - Liberty prepared a basic analysis focusing on the two worst units (2 and 5) in the 2008-2009 timeframe (see next slide) and reached conclusions similar to Scott Madden

It is therefore not clear that the EFOR performance issues of the last ten years can be fully explained by low quality coal, although it is sure that low quality coal is a meaningful contributor, especially on Unit 5.

Base Load Coal Performance

Analysis of Outage Causes

	Eq Hrs / Yr			Eq Hrs / Yr		
	FC 2	**Industry**	**Difference**	**FC 5**	**Industry**	**Difference**
BOILER	610	517	92	594	287	307
BALANCE OF PLANT	208	66	142	221	78	143
STEAM TURBINE	10	56	-46	9	58	-49
GENERATOR	46	35	11	13	39	-26
MISCELLANEOUS	0	0	0	0	0	0
POLLUTION CONTROL EQUIPMENT	40	13	27	3	10	-7
Catastrophe	0	9	-9	0	4	-4
Economic	0	2	-2	0	1	-1
Fuel Quality	5	17	-11	2	10	-8
REGULATORY; SAFETY; ENVIRONMENTAL	0	54	-54	1	11	-9
PERSONNEL ERRORS	3	5	-2	6	7	-1
PERFORMANCE	3	4	-1	0	1	-1
	926	**780**	**146**	**850**	**506**	**344**

FC averages are for 2008-2009. Industry averages are for 2005-2009.

- Note that outage causes under balance of plant (non-related to coal) were well above the industry
- In addition, the percentage of outage time attributed to boiler issues (presumably related in part to coal) for FC 2 (66%) is identical to the industry percentage – but not so on FC 5 (70% vs 56% industry)
- FC 2 and 5 would be above the industry average EFOR even if the boiler category were ignored.
- Based on the data available at this time, it is not appropriate to dismiss the poor Four Corners outage performance simply on the basis of low quality coal.

Base Load Coal Performance

Analysis of Data Reporting

- APS has further responded that it did not classify any outages or de-rates as “maintenance”, but rather reported all (other than planned outages) as “forced”. This would have the obvious effect of artificially inflating EFORs
- Liberty examine the typical amount of maintenance outages reported by others with the following results:

	FC 1	FC 2	FC 3	FC 4	FC 5
Industry Average Maintenance Hours	186	186	182	122	122
Potential Impact on FC EFOR	2.1%	2.1%	2.1%	1.4%	1.4%

- If the industry average maintenance hours were deducted from the reported forced outage hours, FC EFORs would drop
- Ten year EFORs would approximate industry averages except for Unit 5, which would continue to be well over average

It is likely that EFORs are artificially inflated by APS’s incorrect accounting. Only a re-accounting can determine the effect of this overstatement.

POWER PLANT COSTS

Clarification of Plant Data

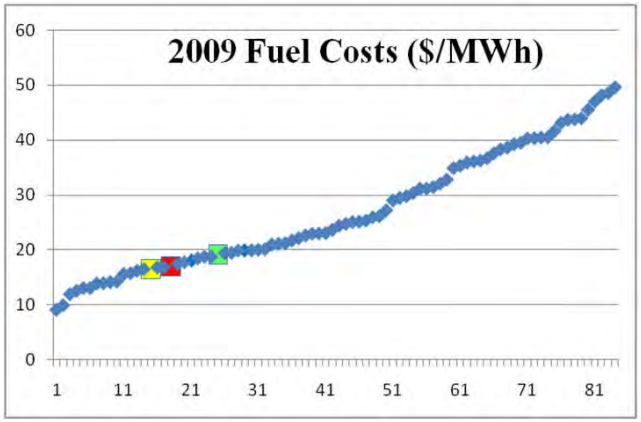
- In analyzing the data in this section, it is critical to note that all of the data is presented by the *individual power plants without regard to APS's ownership share of each plant*.
- The data is therefore valid for measuring station performance, but not for judging the economic effects or other impacts on APS.
- Note that:
  - APS has a very small share in the big units
  - APS has a very big share in the small units

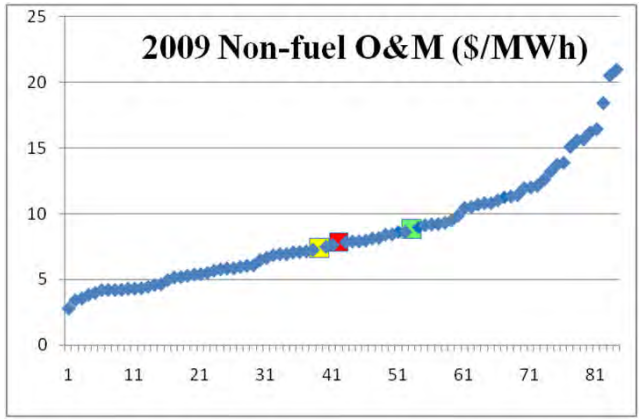
As a result, ***the costs shown here will be much lower than the APS specific production costs discussed later in the O&M Cost section***, which reflect APS's share of each plant

Base Load Coal Performance

Production Costs

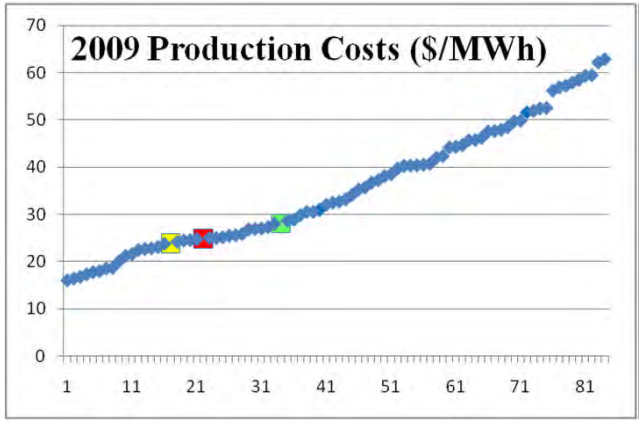
Cholla
Four Corners
Navajo





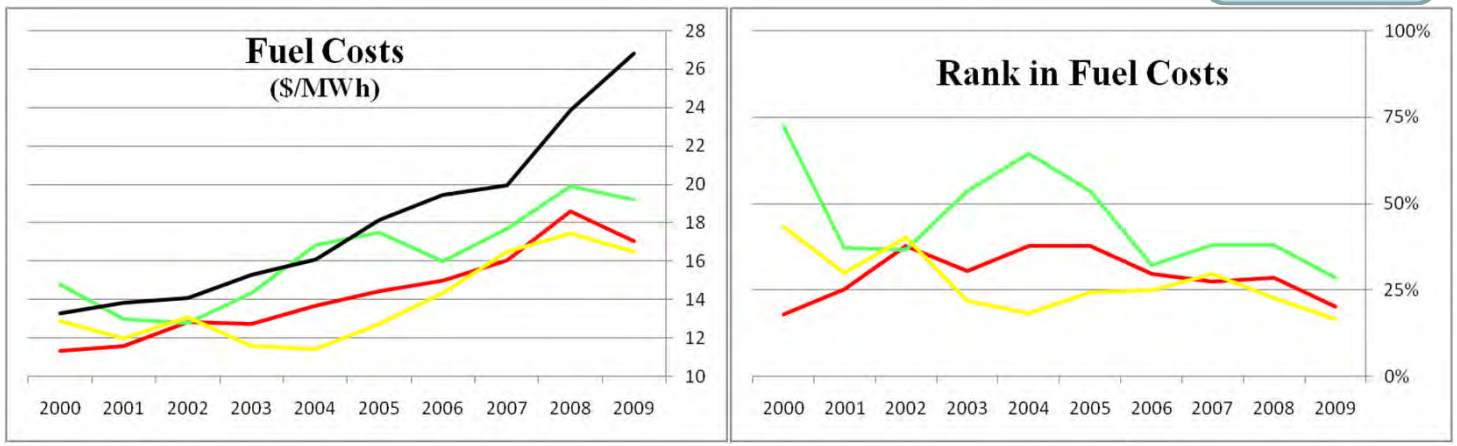
- The APS power plants fare well in fuel costs, and hence total production costs
- Non-fuel O&M is average or a little below

Note: The costs shown for Cholla are for all 4 units, not just the 3 owned by APS. If and when further analysis of this category proves appropriate, that correction will have to be made.



Base Load Coal Performance

Fuel Costs

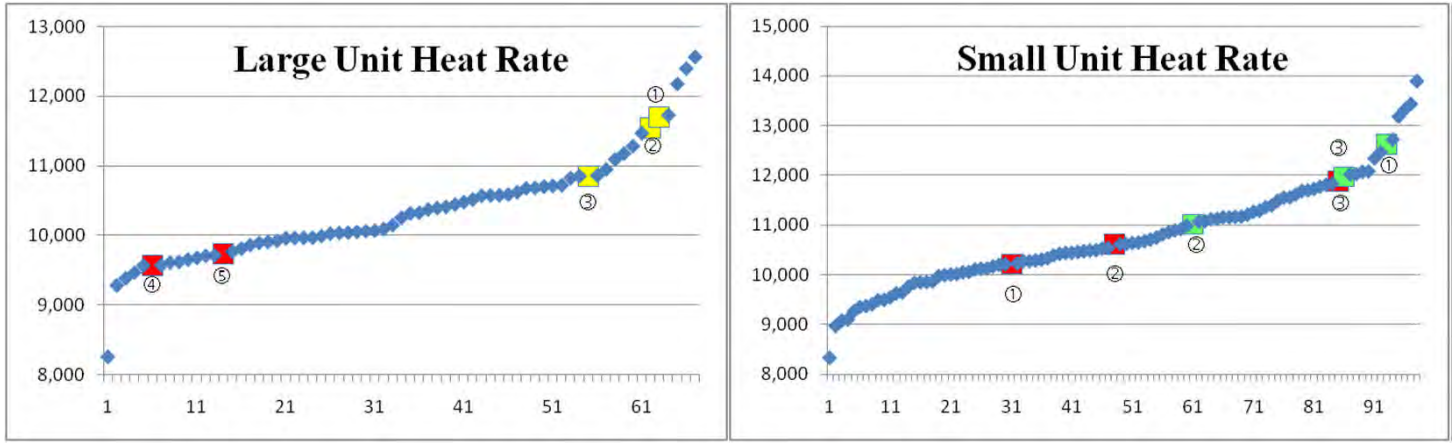


- The APS plants improved versus the industry in the last two years, when the costs of others increased substantially
- The relative ranking of each plant improved over the last 10 years, particularly so for Cholla
- All three plants are now in or near the best quartile
- Note the sharp rise in industry fuel costs which is likely to be contributing to the decline in capacity factors through less frequent dispatch of coal

Base Load Coal Performance

Plant Efficiency

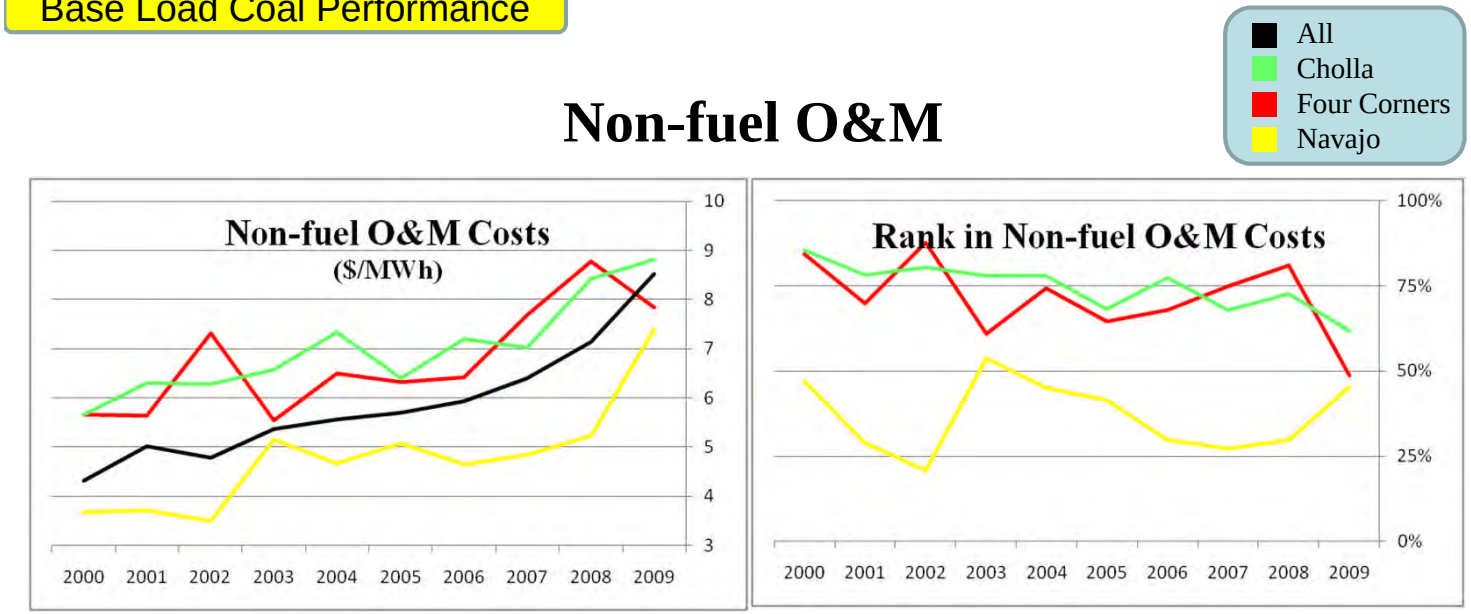
Cholla
Four Corners
Navajo



- The good performance in fuel costs comes despite generally weak rankings in heat rate
- It is not clear why heat rates are so high for what appear to be efficient plants

Base Load Coal Performance

Non-fuel O&M

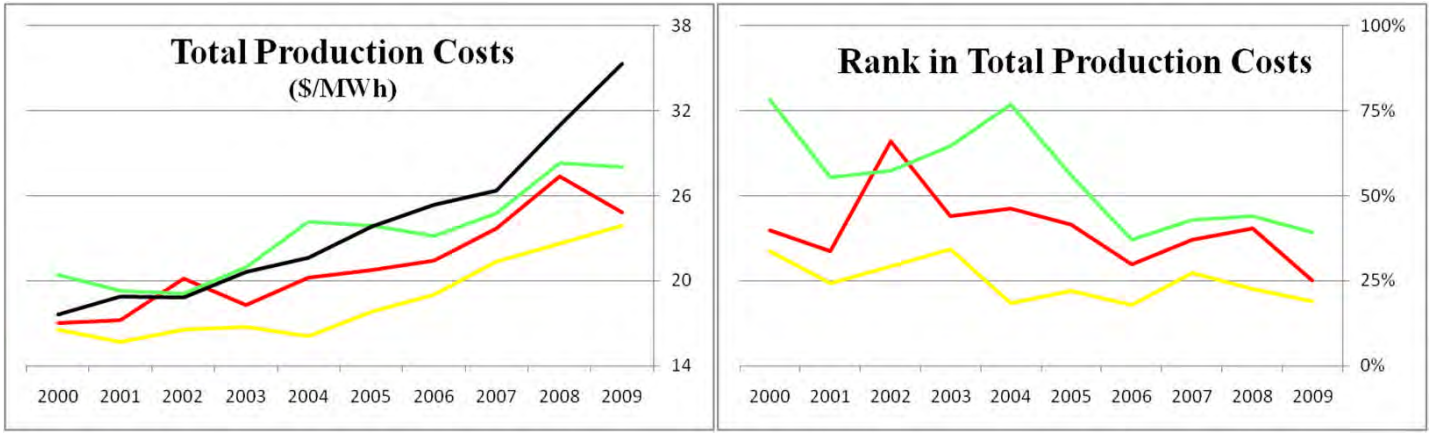


- The best performing APS plant, Navajo, has been returning to the mean and is approaching the 3rd quartile
- Navajo escalation rates are above the industry and especially poor in the last two years
- FC and Cholla have been consistently improving relative to the industry
- FC escalation rates are relatively low, allowing FC to improve considerably, especially in the last year, now reaching Q2

Annual Escalation Rate		
	2000-09	2007-09
Four Corners	3.7%	1.0%
Cholla	5.1%	12.0%
Navajo	8.1%	23.7%
All	7.9%	15.4%

Base Load Coal Performance

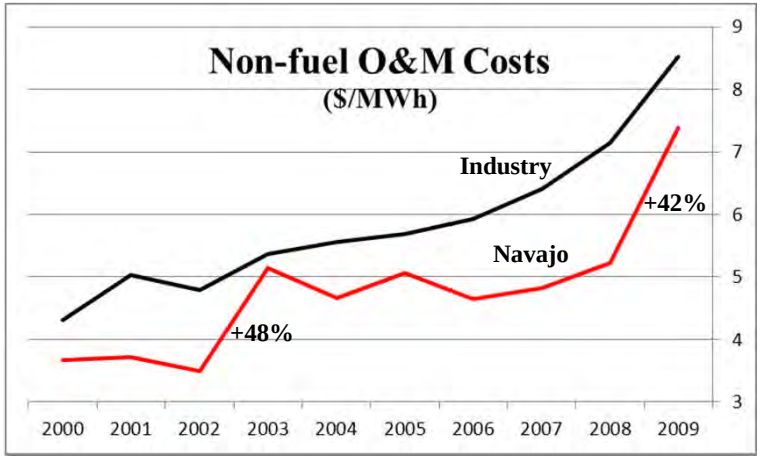
Total Production Costs



- Production cost comparisons are favorable, thanks to fuel costs
- All 3 plants are in the 1st or 2nd quartile

Analysis of Navajo Escalation

- APS explains that Navajo is on a 6 year cycle with major overhauls each year for three years followed by minor overhauls in the next 3 years
- A new cycle started in 2009, suggesting that costs in 2006-2008 were below average and that costs in 2009-2011 should be expected to be above average



The data confirms the APS analysis. Note that the 2009 bump is almost identical on a percentage basis to the bump 6 years earlier.

Base Load Coal Performance

Summary of Observations

- Capacity Factors
  - Plant utilization, as measured by capacity factor, ranks high at all units, with most units consistently in the first quartile of the panel
  - "Official" Four Corners small unit (1-3) CFs seem to be overstated by more than 5%
  - APS small units have improved their industry standing in recent years, primarily because they have not dropped as the industry has
  - There have been recent unusual (out of character) drops in CF at FC 5, Cholla 3 and Navajo 3
- Availability
  - Unit availability is generally high versus the industry except at FC 5
  - There have been recent drops in availability at Cholla 1 and Navajo 3, but they remain near industry levels
- Forced Outages
  - Forced outage rates are above industry at all FC units and more recently at Navajo 3
  - There are ominous trends in forced outage rates at FC 1,2,5 and Navajo 3
  - It is not appropriate to dismiss high EFORs on bad coal without further analysis
- Fuel costs
  - At or near the best quartile for all plants
  - Better than heat rate would suggest
- Non-fuel O&M
  - Middle of the pack.
  - There has been a sharp recent rise at Navajo – escalating at more than industry rates, but explainable by the six year major outage cycle

Recommendations

- Four Corners forced outage rates
  - It is not clear that low quality coal fully explains the consistently high EFORs
  - Improper reporting practices are also contributing but the amount is unclear
  - The pending retirement of Units 1, 2 and 3 lessens, but does not eliminate, the potential for improvement
  - The lack of quantitative analysis of outage causes and trends should be of concern
  - Unit 5 seems to be particularly troublesome

Recommendation 4.1: APS should consider the implementation of a continuing program for the analysis of outage causes

Recommendation 4.2: APS should align its reporting practices with NERC (GADS) requirements and the rest of the industry, including the classification of maintenance outages

Recommendation 4.3: A specific analysis of Four Corners 4 and 5 should be completed to:

a) Define the contribution of low quality coal to EFORs
b) Define the contribution of maintenance outage hours
c) To the extent that non-fuel causes are also contributing to the negative comparisons, develop mitigating strategies as cost effective and appropriate.

It is recognized that the Scott Madden study may successfully answer these questions, negating the need for a new study.

Exhibit V

Nuclear Performance

Benchmarking Variables

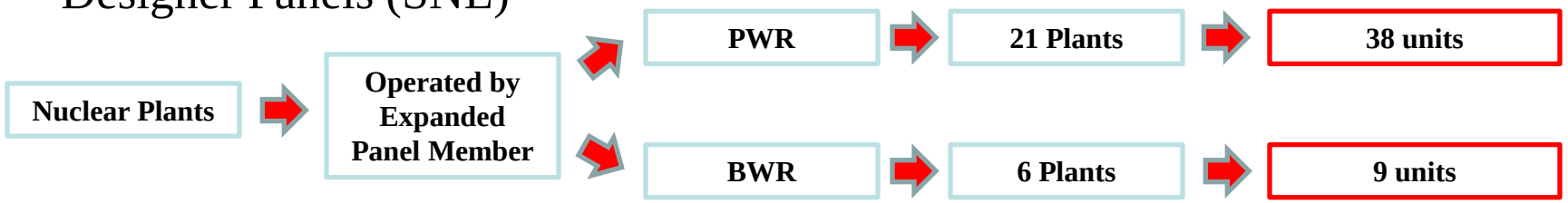
- Operational Performance – by unit
  - Unit capacity factor (CF)
  - Equivalent Availability Factor (EAF)
  - Equivalent Forced Outage Rate (EFOR)

    The term “equivalent” simply means that de-rates are included proportionately as outage time
- Power Plant Production Costs – by power plant
  - Fuel
  - Non-fuel Operating costs
  - Maintenance

Panel Development

- The panel consists of specific nuclear units operated by various panel companies
- Only power plants operating in 2009 are considered – those shut down for major overhauls would unduly distort the data
- Where bulk GADS data is utilized as opposed to specific unit-by-unit SNL data, the panel is based on all types of plants (PWRs and BWRs) over 1,000 MW
- The main panel used here is 47 units, most of which are PWRs

- Designer Panels (SNL)



- Bulk Panels (GADS)
  - Nuclear Plants - Types - Above 1,000 MW – **51 units**

Palo Verde Nuclear Generating Station

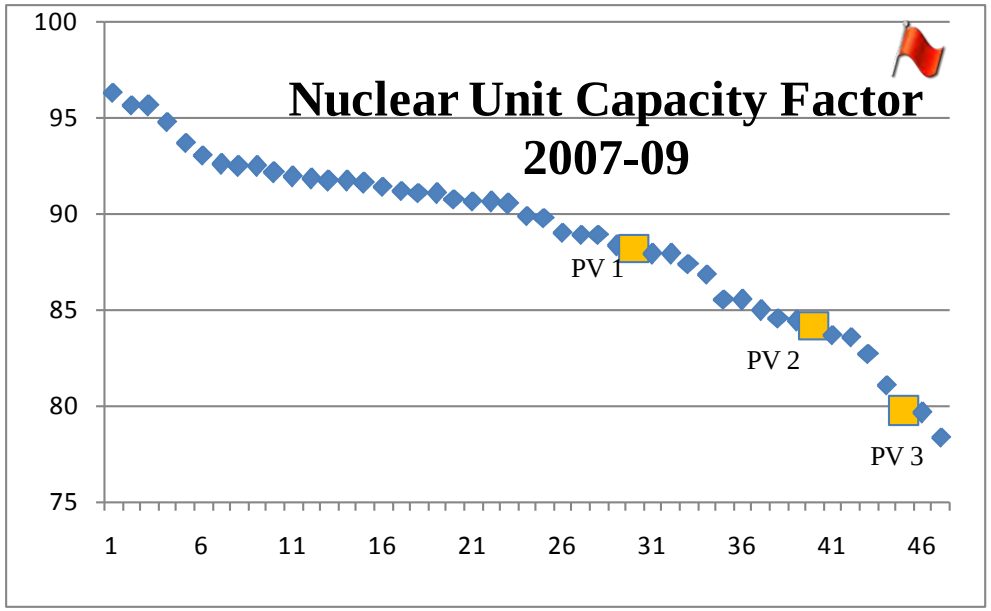
Plant	Unit	Capacity	Age	Operator
Palo Verde	1	1,311	24	APS
Palo Verde	2	1,314	24	APS
Palo Verde	3	1,317	22	APS

Company	Percent Ownership	Expanded Panel Member
Arizona Public Service Co.	29.10%	Yes
Salt River Project	17.49%	Yes
El Paso Electric Co.	15.80%	Yes
Southern California Edison Co.	15.80%	Yes
Public Service Co. of New Mexico	10.20%	Yes
Southern California PPA	5.91%	No
Los Angeles Dept Water & Power	5.70%	No

Nuclear Capacity Factors

- The sharp increase in nuclear industry capacity factors over the last 20 years is one of the greatest, yet most under-recognized, success stories in American industry.
- The increase literally was equivalent to thousands, or tens of thousands, of MW of new “free” capacity.
- This has raised the bar considerably and CFs of more than 90% are routine, while those under 85% represent substandard results
- Some of this “miracle” is bogus in that utilities have increased unit output without changing “official” rated capacity. The result is frequent reporting of >100% CFs.
- Notwithstanding this gimmickry, the industry has indeed achieved a great success, and expectations are high for all nuclear units.

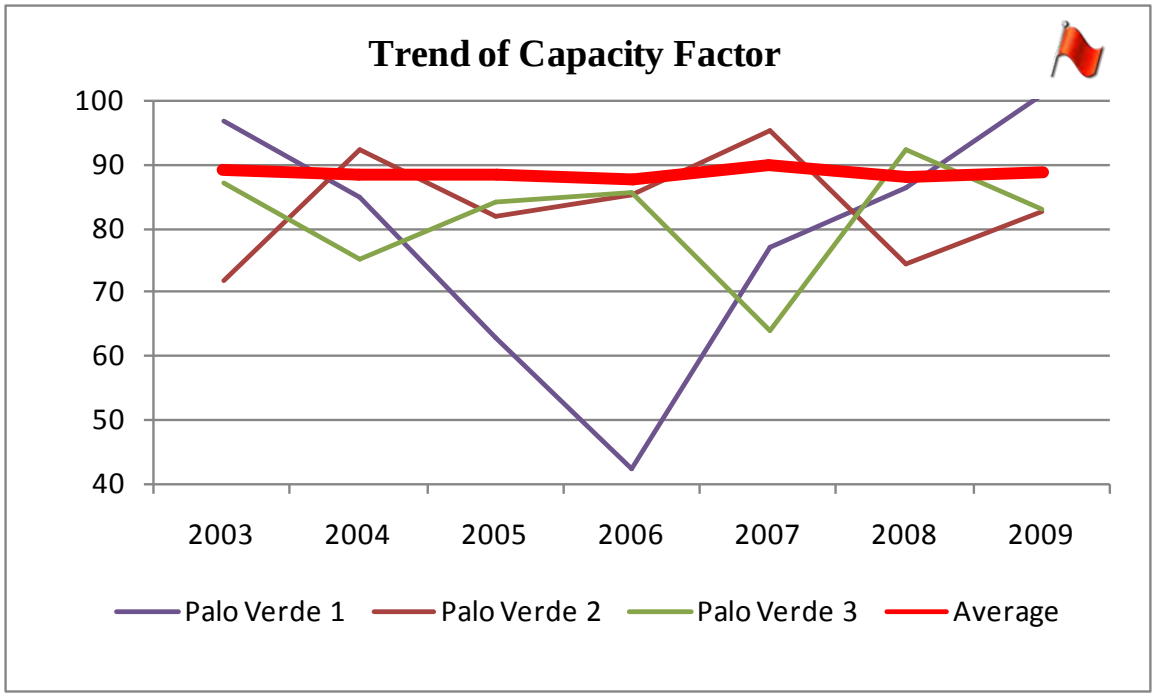
Nuclear Unit Capacity Factor



- The 47 unit panel includes all nuclear units operated by expanded base panel companies
- All sizes and types are included
- A 3 year average is used to remove refueling outage distortions

- The PV units fall into the 3rd and 4th quartiles for 2007-09 average capacity factor

Expanded Panel Capacity Factor – Unit Level



- The average for the panel units has consistently been around 90% for the period of our study
- All three PV units compare poorly to the panel average

- In the 7 year period, there are only 5 instances (out of 21 possibilities) in which a PV unit has surpassed the industry average

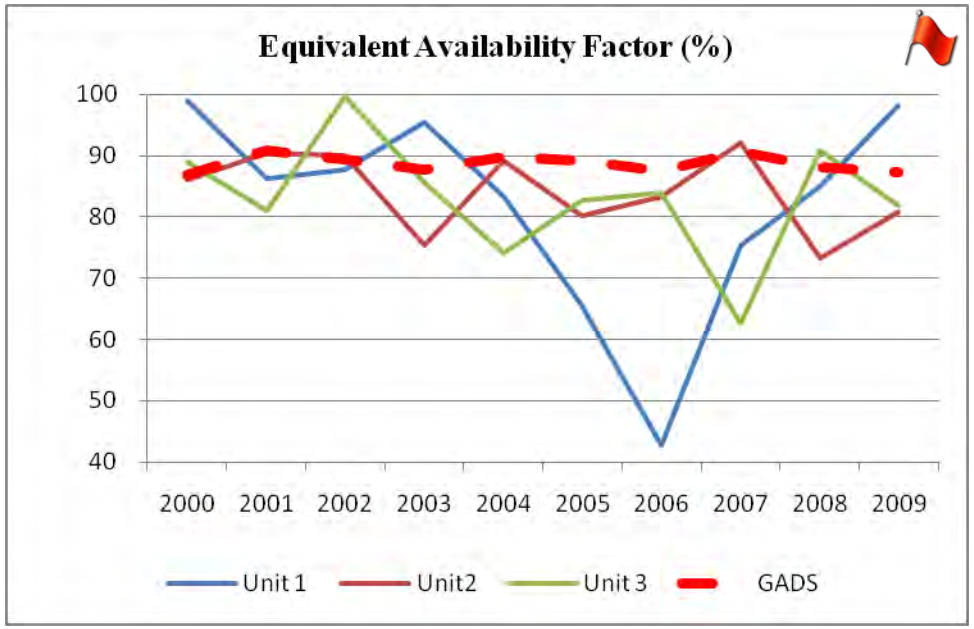
Expanded Panel Rankings

Top quartile
2nd quartile
3rd quartile
Bottom quartile

Nuclear Plant Unit	2003	2004	2005	2006	2007	2008	2009	7 Yr Avg
Palo Verde 1	77%	28%	0%	0%	6%	45%	91%	0%
Palo Verde 2	2%	66%	15%	26%	66%	9%	20%	9%
Palo Verde 3	32%	4%	19%	28%	0%	62%	22%	2%

- The chart shows the ranking in each year of the PV units versus the 47 panel utilities (for example, 77% means the unit outperformed 77% of the panel units)
- The preponderance of red cells makes it clear that all three of the PV units operated consistently in the 4th quartile and, to a lesser extent, the 3rd quartile.
- There was only two instances of 1st quartile performance, one recently and the other 7 years ago
- From a customer perspective, there are few issues within a utility with the potential impact of a large, underperforming nuclear plant

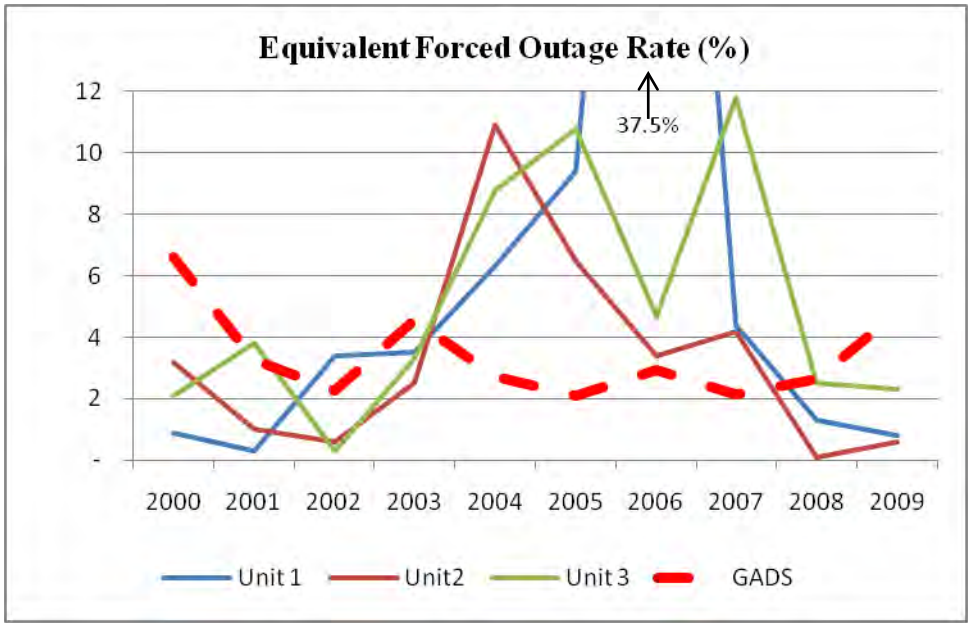
Equivalent Availability Factor



Equivalent Avaliability Factor		
Unit	10 Year Average	Years Under Industry
Palo Verde Unit 1	82%	7
Palo Verde Unit 2	84%	8
Palo Verde Unit 3	83%	7
Industry Average	89%	

- The chart shows all three units as consistently under the industry average for equivalent availability – in this case, industry average is the GADS panel of 1,000+ MW units
- Availability has averaged more than 5 points below the industry, which means that APS and its customers have been deprived of more than 200 MW of capacity and the associated low cost energy for the last 10 years

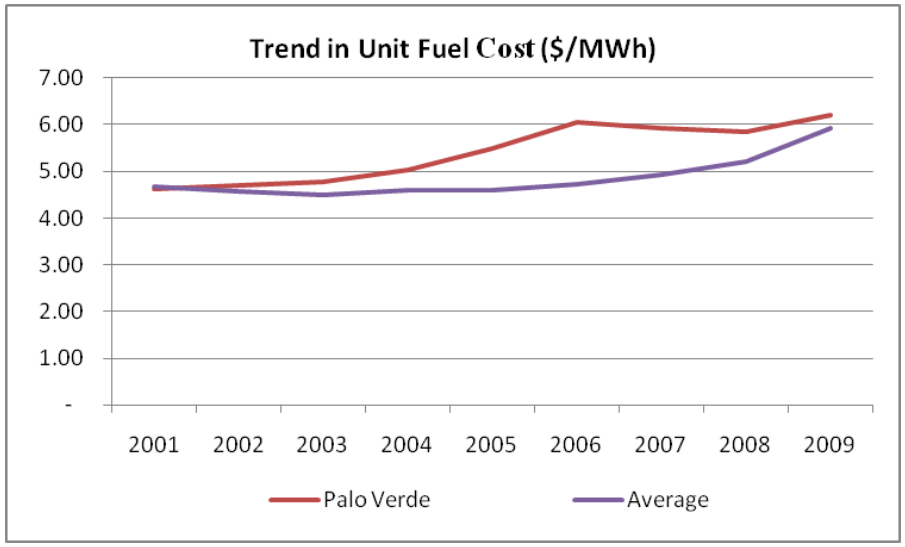
Equivalent Forced Outage Rate

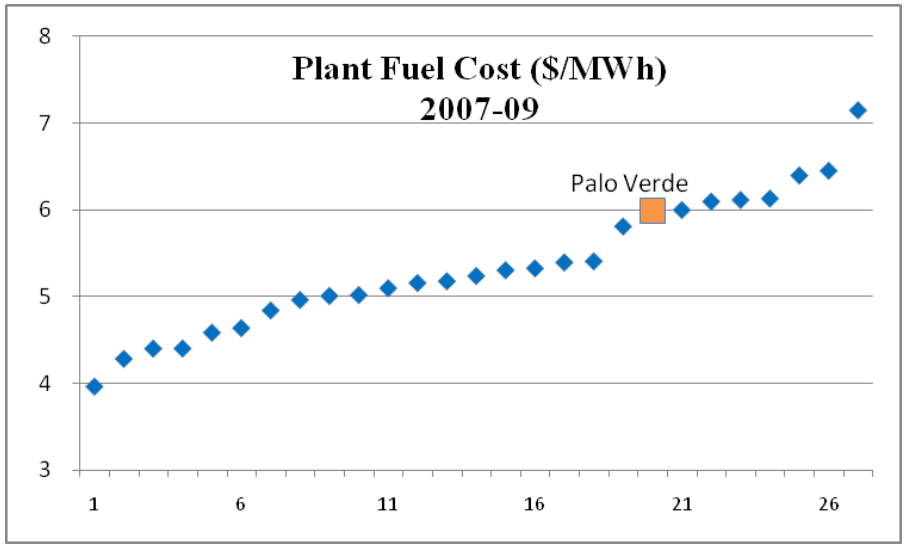


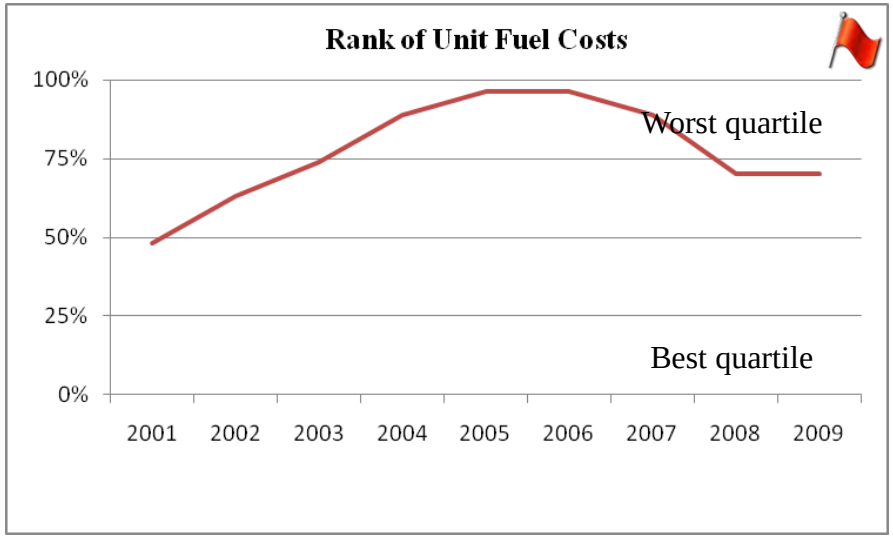
Equivalent Forced Outage Rate		
Unit	10 Year Average	Years over Industry
Palo Verde Unit 1	6.78%	5
Palo Verde Unit 2	3.30%	4
Palo Verde Unit 3	5.04%	5
Overall Industry	3.40%	

- The EFOR chart shows a very different pattern than the EAF. Here we see the units performing better than the industry average except for the problem years of 2004-07
- The magnitude of the problem years distorts the overall averages, masking what was actually better than average performance outside the aberrant years

Plant Fuel Costs

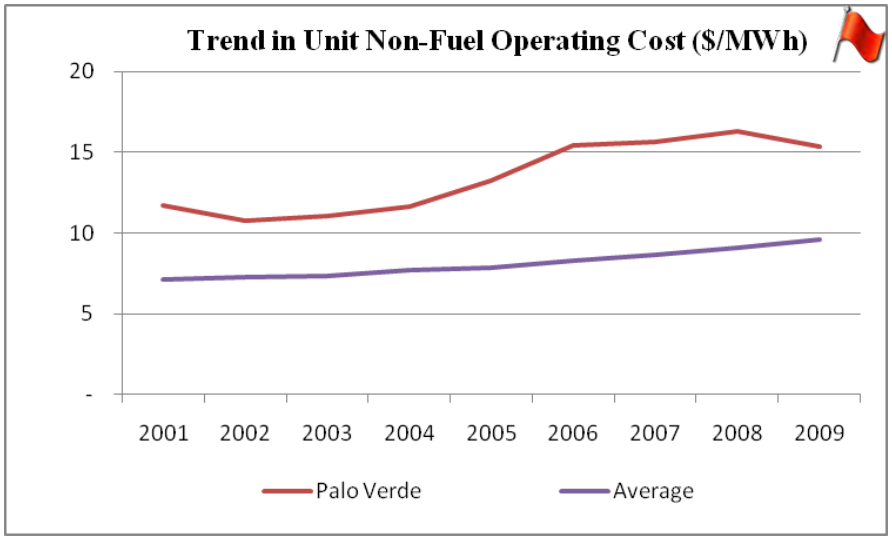


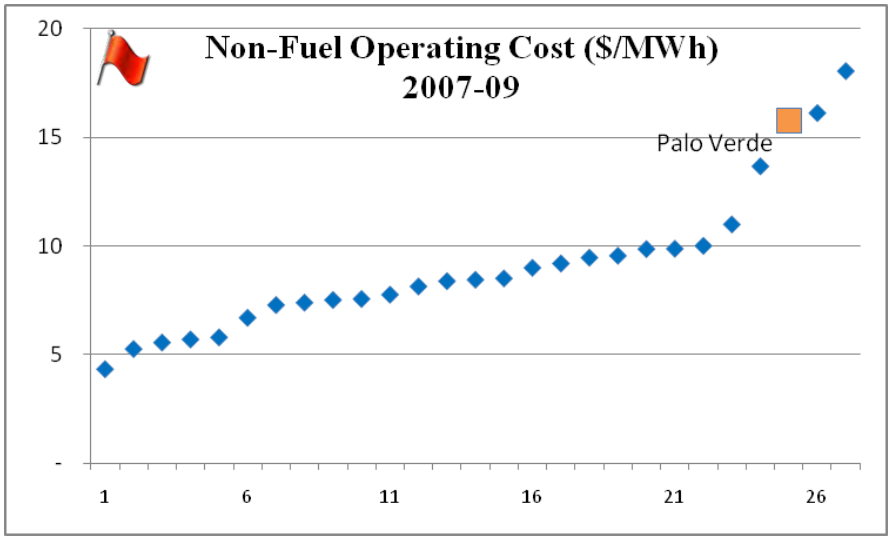


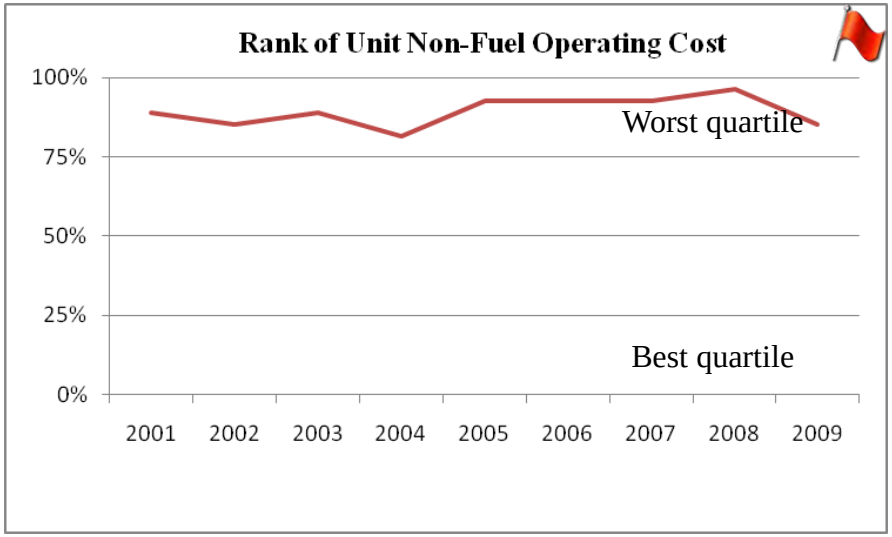


- PV's fuel costs have approximated the panel average except during the problem years
- Despite being close to the industry average, the APS ranking is somewhat worse, near the bad end of the 3rd quartile

Non-fuel Operating Costs

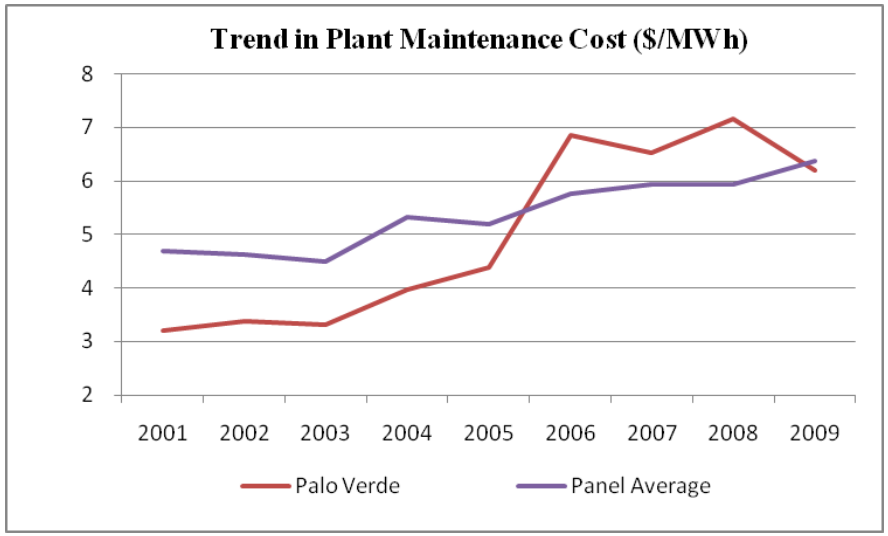


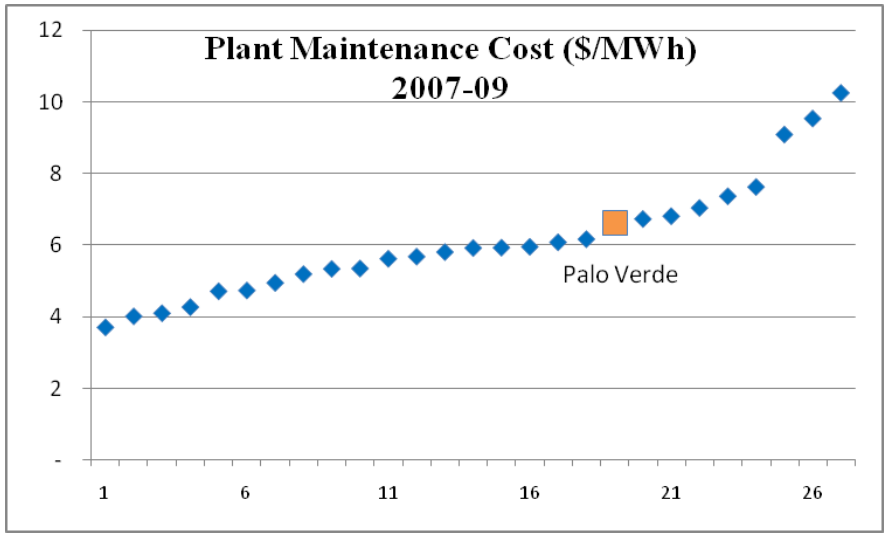


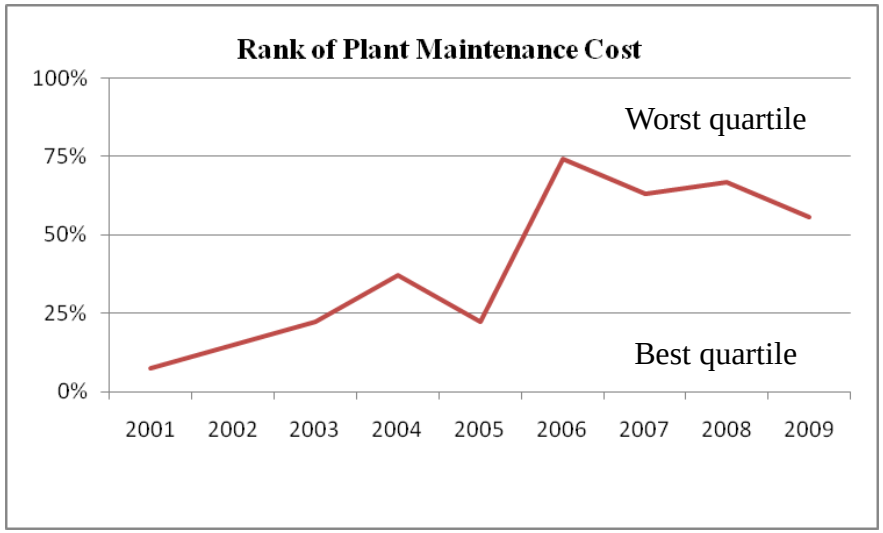


- PV's performance versus the industry has constantly been Q4
- Non-fuel operating costs have generally been more than 50% above the panel average

Plant Maintenance Costs

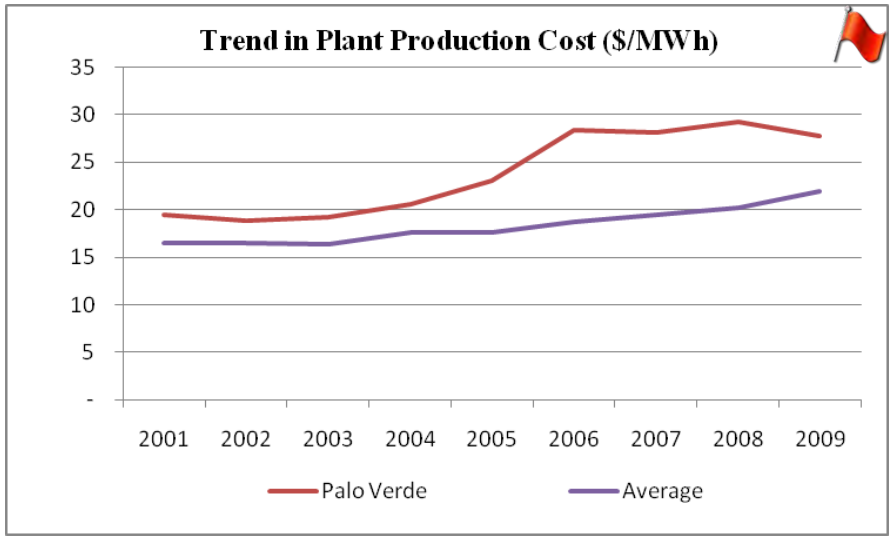


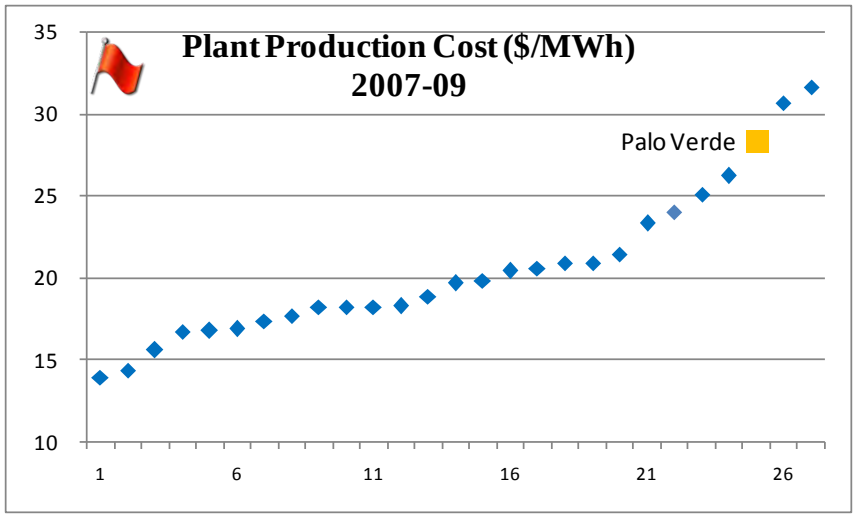


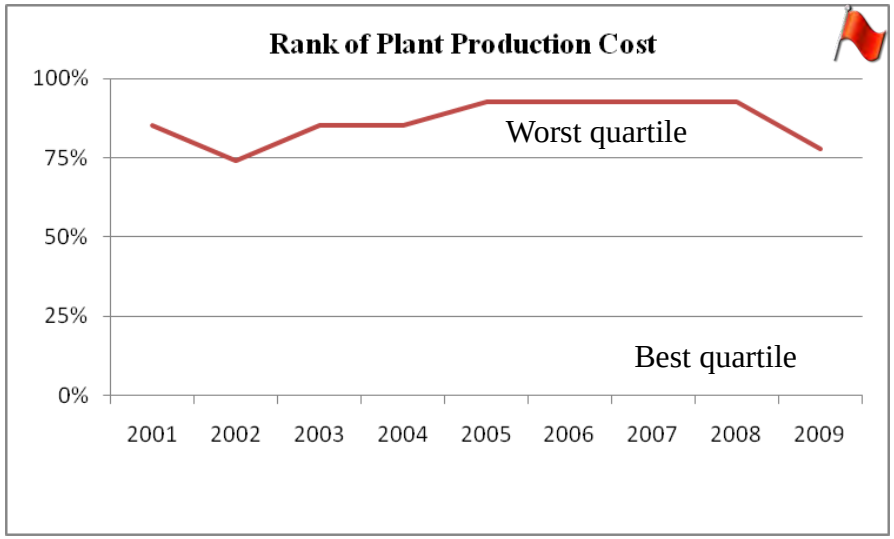


- PV's performance versus the industry has declined, from Q1 in 2003 to Q3 today
- Plant maintenance costs now align approximately with the panel average, although the average for the last three years was somewhat higher

Plant Production Costs







- PV's total production costs have consistently exceeded the industry average
- The primary driver has been non-fuel operating costs
- Production costs have been steadily in the 4th quartile

EUCG Comparisons

EUCG chart omitted due to confidentiality restrictions

- Electric Utility Cost Group data is generally not available on a public basis
- The limited data here was provided by APS

- Palo Verde has been well above industry levels in recent years
- Although the plant has returned to "average", it is still well above the 50% point (median)
- The improvement since 2008 suggests that the company's costs management initiatives are working. This conclusion is tempered somewhat by the realization that most of the reduction is due to increased generation

Palo Verde Cost Improvement 2008 - 2010		2010 versus 2008
Generation	Change in MWh	6.8%
Non-fuel O&M	Change in $/MWh	-8.5%

Summary of Observations

- Expectations are high for strong nuclear performance, driven by:
  - Excellent performance by the industry as a whole, with capacity factors now routinely in the 90% range
  - The leveraged effect of good (or bad) performance from major nuclear units – poor performance quickly adds up to high dollar consequences
- Capacity factors at Palo Verde have consistently lagged those of other panel members
- Low capacity factors were a special problem during the problem years of 2005-07, but PV's underperformance versus the panel was not limited to those years
- Availability of the PV units has been more than 5% worse than the industry on a regular basis.
- Forced outage rates at PV have generally matched the industry other than during the problem years
- Production costs have consistently been in the 4th (worst) quartile, with the primary driver being non-fuel operating costs.

Analysis of PV Availability

- Capacity Factor and Availability at Palo Verde
  - All three Palo Verde units regularly lag the industry
  - Availability has averaged 5-7 points below the industry

- APS has offered numerous comments on these findings, including:
  - PV has operated consistently well relative to the rest of the industry
  - PV replaced steam generators in the period studied
  - PV has many unique features
  - Spending in the 1993-2003 time period was not sufficient to maintain prior performance, with the results presumably showing in 2003-2009

- Liberty believes that none of these explanations suitably explain the station's competitive position
- Each explanation is either not appropriate or not demonstrated in any quantitative way.

Analysis of Production Cost

- PV's total production costs have consistently exceeded the industry average
  - This is true when compared to the Expanded Base Panel average
  - This is true also when compared to only PWR on the Expanded Base Panel
  - This is also true when APS compared itself to the EUCG industry average, which is made up of all the US nuclear power plants

- APS has offered numerous comments on this finding, including:
  - PV has many unique features (curiously all of which have a negative impact on costs)
  - Increased NRC inspections raised costs
  - Maintenance issues today because of lower funding yesterday (1993-2003)

- Both the Non-Fuel Operating Costs and Maintenance Costs show significant improvement in 2009, due at least in part to higher generation.

- Actual 2010 costs, as reported by APS, continue this downward trend

Recommendations

- Capacity and Availability Factors

Recommendation 5.1: Notwithstanding the NPRS tiers, APS should establish a more aggressive goal of achieving at least industry median capacity factors sustained over a multi-year period. Plans to accomplish this goal, including the specific tactics to be employed, should be shared with the ACC on an annual basis.

Recommendation 5.2: As a supporting component to Palo Verde's capacity factor goals, the company should continue its efforts to aggressively reduce the duration of refueling outages, which in the past have been well beyond the industry average of about 40 days.

- Production Costs

Recommendation 5.3: APS should incorporate into its cost management program, an ongoing analysis of its cost performance versus other EUCG companies with the specific objectives of (a) identifying the reasons for deviations; (b) quantifying the impact of those reasons; and (c) developing mitigation schemes if and as appropriate.

APS Benchmarking Analysis

Exhibit VI

Sustainability

Sustainability

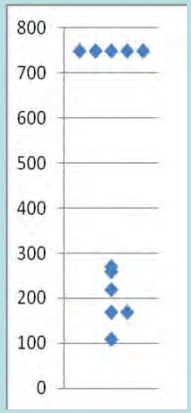
Benchmarking Variables

- This analysis focused on generating units – emissions are for each unit, not for the total company
- CO_2 Emissions
  - Tons per year
  - Tons per MWh
- NO_x Emissions
  - Pounds per year
  - Pounds per MWh
- SO_2 Emissions
  - Pounds per year
  - Pounds per MWh
- Data for 2001-09 extracted from SNL

Sustainability

Panel Development

- The Liberty expanded panel (including E&G utilities) is used
- Only units falling into two size categories are considered
- Only coal-fired units are considered
- Only units with CF > 60% are considered



APS unit sizes

- APS coal units fall into two categories
  - Large ~750 MW
  - Small ~100 – 300 MW

- Designer Panels (SNL)

Coal-fired Plants → **>60% Capacity Factor** → **Operated by Expanded Base Panel Member** → **Large 600-1,000 MW** → **68 units**

Operated by Expanded Base Panel Member → **Small 100-300 MW** → **98 units**

Sustainability

Panel Companies

Large Units

Company	Units
Alabama Power Company	7
Appalachian Power Company	2
Arizona Public Service Company	2
Carolina Power & Light Company	1
Consumers Energy Company	1
Dayton Power and Light Company	1
Detroit Edison Company	6
Duke Energy Carolinas, LLC	2
Duke Energy Indiana, Inc.	5
Entergy Arkansas, Inc.	4
Florida Power Corporation	2
Georgia Power Company	10
Interstate Power and Light Company	1
Kansas City Power & Light Company	3
MidAmerican Energy Company	3
Northern States Power Company - MN	3
Ohio Power Company	2
Public Service Company of Oklahoma	1
Salt River Project	3
Southwestern Electric Power Company	1
Union Electric Company	2
Virginia Electric and Power Company	1
Westar Energy, Inc.	3
Wisconsin Electric Power Company	2
24 Companies	**68**

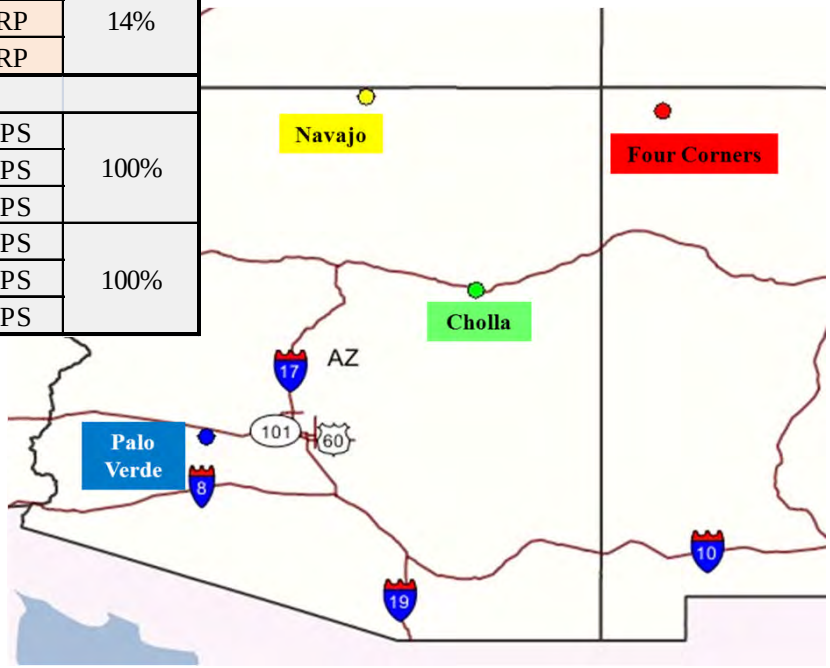
Small Units

Company	Units
Alabama Power Company	9
Appalachian Power Company	2
Arizona Public Service Company	6
Carolina Power & Light Company	5
Consumers Energy Company	10
Detroit Edison Company	1
Duke Energy Carolinas, LLC	1
Duke Energy Ohio, Inc.	2
Georgia Power Company	4
Gulf Power Company	2
Indiana Michigan Power Company	2
Indianapolis Power & Light Company	4
Interstate Power and Light Company	1
Kansas City Power & Light Company	3
Kentucky Utilities Company	1
Louisville Gas and Electric Company	3
MidAmerican Energy Company	2
Nevada Power Company	4
Northern States Power Company - MN	1
Ohio Power Company	1
PacifiCorp	6
Public Service Company of Colorado	7
Public Service Company of New Hampshire	1
Sierra Pacific Power Company	2
South Carolina Electric & Gas Co.	3
Union Electric Company	3
Virginia Electric and Power Company	8
Westar Energy, Inc.	2
Wisconsin Power and Light Company	1
Wisconsin Public Service Corp	1
30 Companies	**98**

APS Base Load Coal Units

	APS Base Load Coal Units				
	Unit	Capacity	Age	Operator	APS Share
Large Units					
Four Corners	4	750	41	APS	15%
	5	750	40	APS	
Navajo	1	750	36	SRP	14%
	2	750	35	SRP	
	3	750	34	SRP	
Small Units					
Four Corners	1	170	47	APS	100%
	2	170	47	APS	
	3	220	46	APS	
Cholla	1	110	48	APS	100%
	2	260	32	APS	
	3	271	30	APS	

- There are 11 units, 5 large and 6 small
- 3 are operated by SRP
- The large units are only partially owned
- Youngest units are about 30 years old
- Several units are nearly 50 years old



Sustainability

Size and Output

- In evaluating emissions, it is important to consider both unit size and capacity factor as they influence rankings for total unit emissions
- We have also included emissions on a per MWh basis to provide a more normalized result
- The following size differences should be noted when comparing to the industry averages:

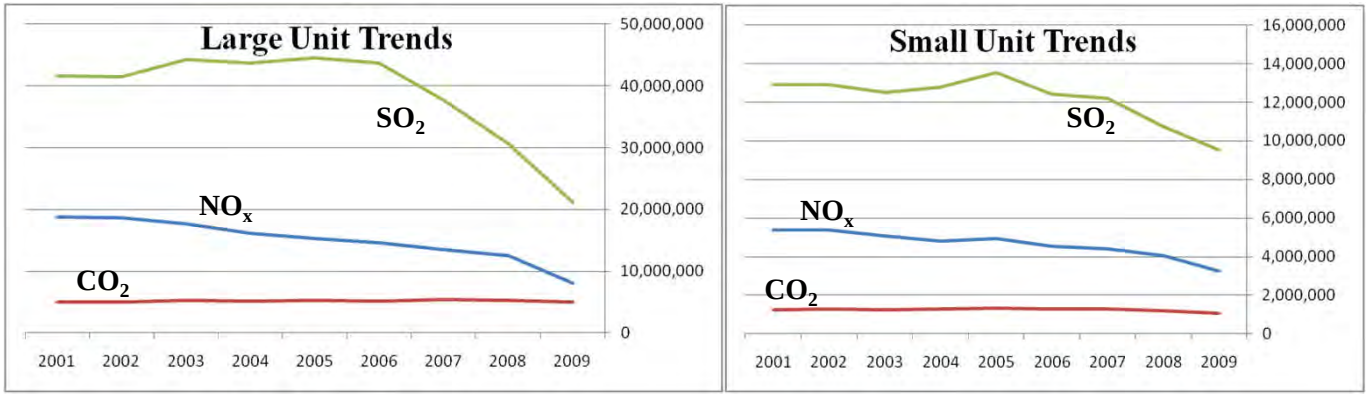
Large Units	Capacity	% of Panel Capacity
Four Corners 4	750	102%
Four Corners 5	750	102%
Navajo 1	750	102%
Navajo 2	750	102%
Navajo 3	750	102%
Panel Average	735	100%

Small Units	Capacity	% of Panel Capacity
Four Corners 1	170	97%
Four Corners 2	170	97%
Four Corners 3	220	126%
Cholla 1	110	63%
Cholla 2	260	149%
Cholla 3	271	155%
Panel Average	175	100%

- The primary size impact will be seen on the Cholla units and, to a lesser extent, FC 3 – all others are the same size as the industry average

Sustainability

Panel Trends – Emissions per Year

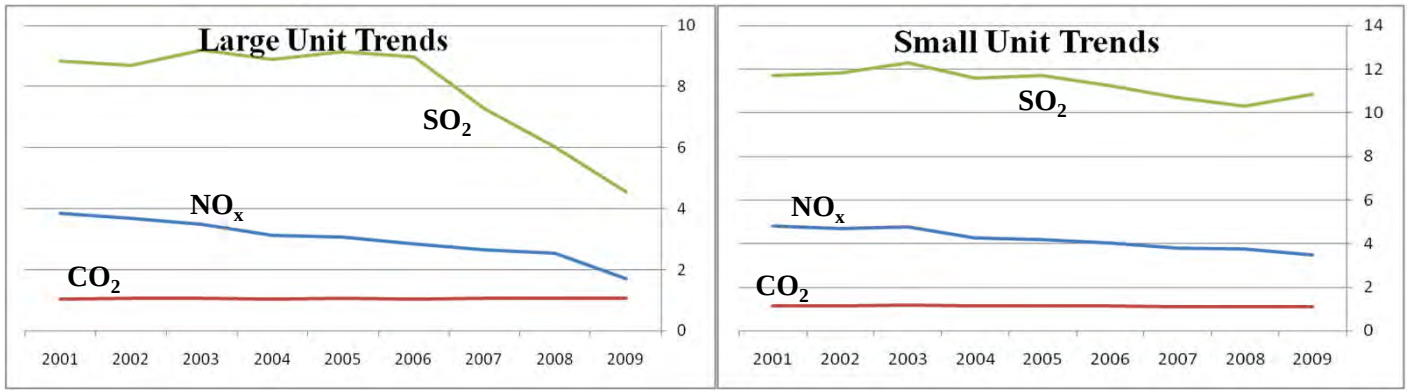


CO_2 – tons per year NO_x and SO_2 – pounds per year

- Annual CO_2 emissions for the panel units have not changed much in the study period
- Both NO_x and SO_2 have halved for the large units and a lesser amount, still substantial, for the small unit panel
- For benchmarking purposes, emissions are a moving target, and analysis must focus on how utilities are keeping up with the industry trend

Sustainability

Panel Trends – Emissions per MWh



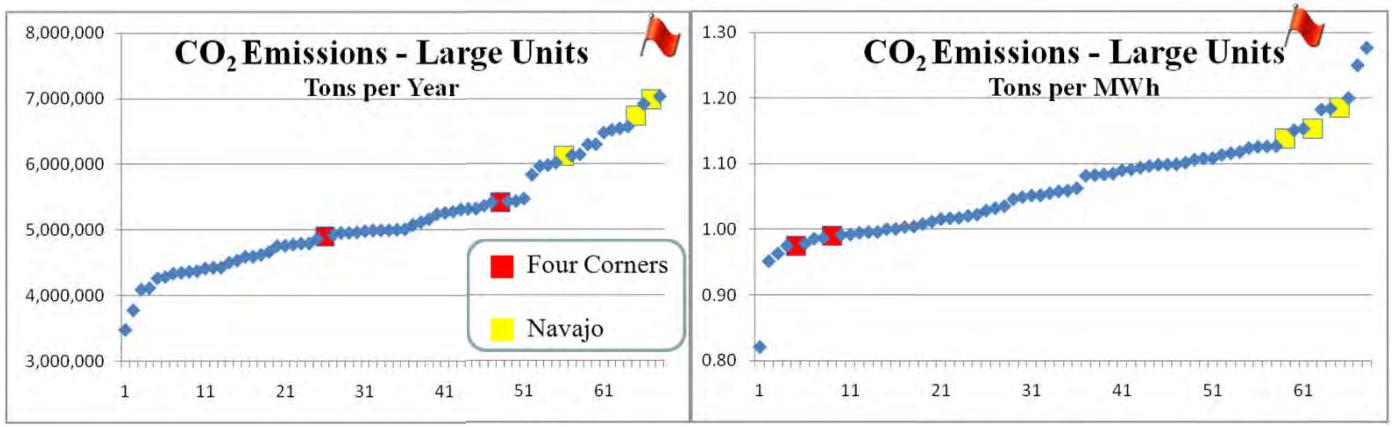
CO_2 – tons per MWh NO_x and SO_2 – pounds per MWh

- The trend in emissions per MWh generated are similar for the large units
- The decreases for the small units is much less pronounced, suggesting that the declining trend in annual quantities may be more due to lessened generation
- This data suggests that, as would be expected, investment in emission reduction is more likely for the larger, newer units

Sustainability

CO_2 Emissions – Large Units

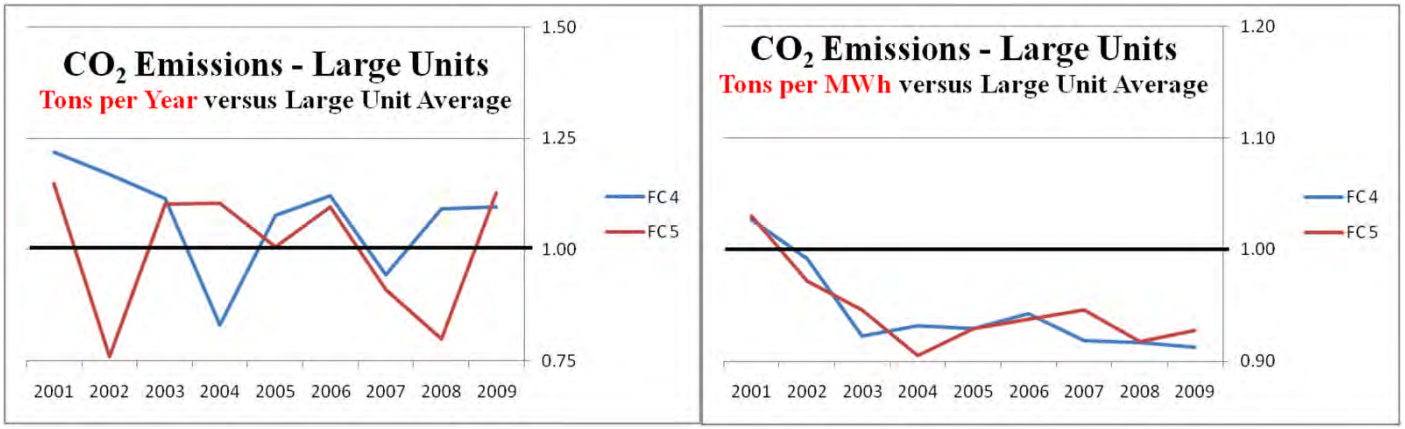
3 year average – 2007- 09



- The Navajo units are in the bottom quartile for CO_2 emissions, both on an absolute basis and on a per unit of generation basis
- Navajo occupies 2 of the bottom 4 slots in tons of CO_2 and 3 of the bottom 10 in per MWh performance
- The latter ranking is especially odd in that Navajo enjoys the top capacity factors in the country – one would expect considerable improvement when measured on an MWh basis
- FC 4-5 are in the middle of the pack on an absolute basis but improve considerably when measured on a per MWh basis

Sustainability

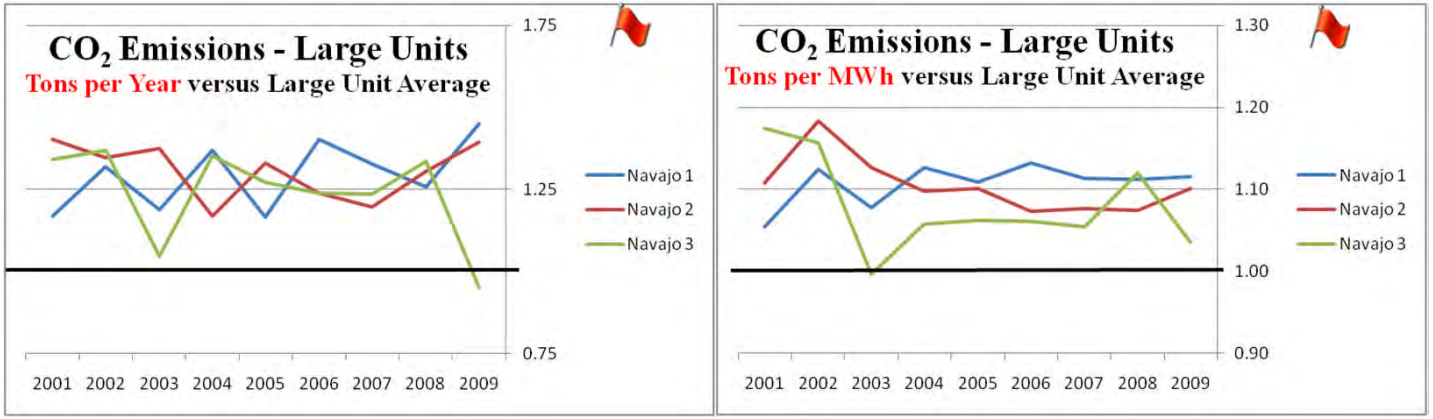
CO_2 Emissions – Four Corners



- On an absolute basis, the FC units cycle around the industry average, likely in relation to generation
- On a per unit basis, the units began an improvement trend a number of years ago and have since been well below the industry average for large units

Sustainability

CO_2 Emissions – Navajo

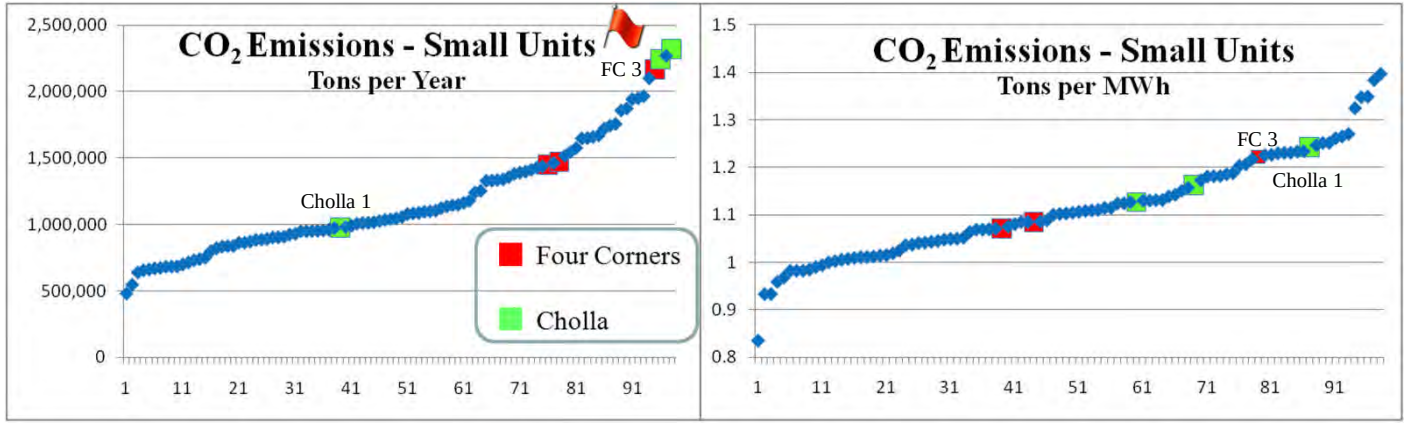


- The Navajo units are generally more than 25% above the average unit in CO_2 emissions
- The recent "improvement" in Unit 3 is likely due to the large drop in output in 2009
- Unit 3 seems best on a per unit basis, but all are above the industry average

Sustainability

CO_2 Emissions – Small Units

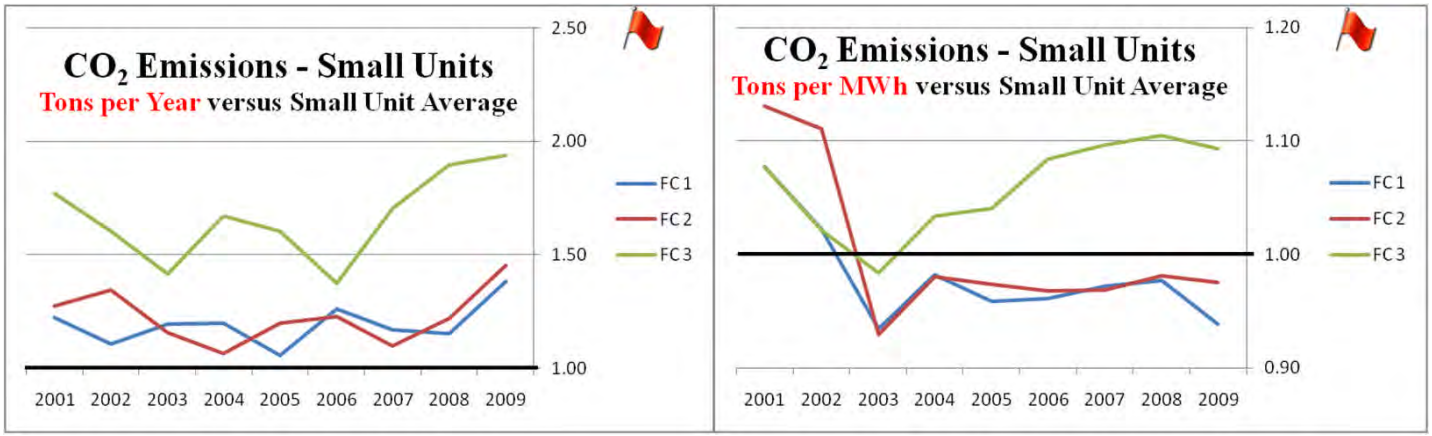
3 year average – 2007- 09



- The Cholla data for tons per year is somewhat misleading due to unit size
  - Cholla 1 is only 63% of the panel's average size unit
  - Cholla 2 and 3 are about 50% bigger than the panel average size
- On a per unit basis, Cholla 1 drops to the 4th quartile, while 2 and 3 improve to Q3
- FC 3, 25% larger than the industry average, is a 4th quartile performer on both an absolute and per unit basis

Sustainability

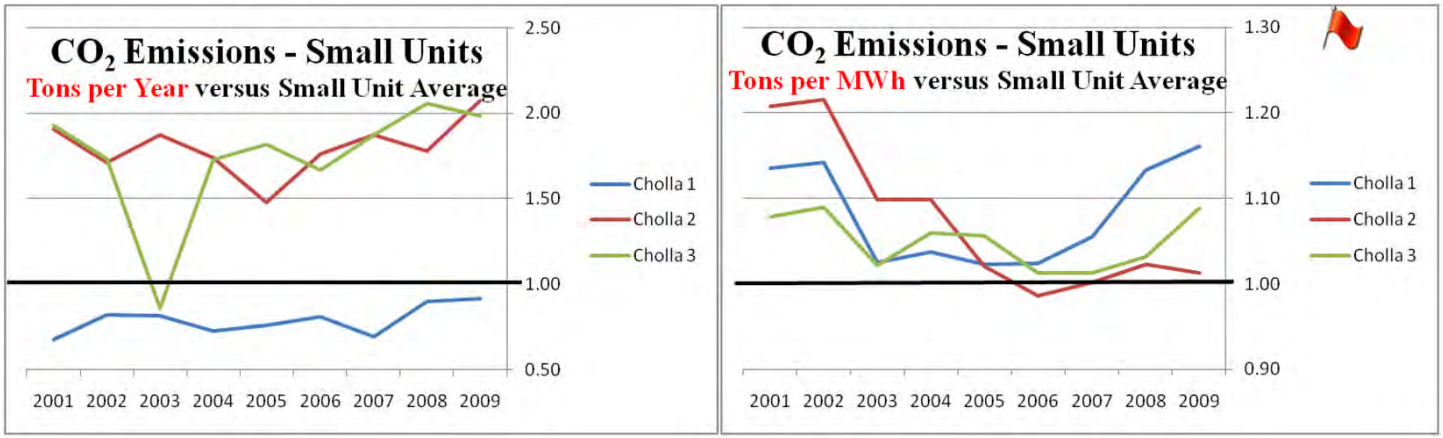
CO_2 Emissions – Four Corners



- When measured against industry averages, FC's stock drops considerably
- The Unit 3 data shows both a large deviation, much larger than explained by size, and a worsening trend
- Note that Unit 3's performance against the panel on a per MWh basis has worsened considerably since 2003

Sustainability

CO_2 Emissions – Cholla

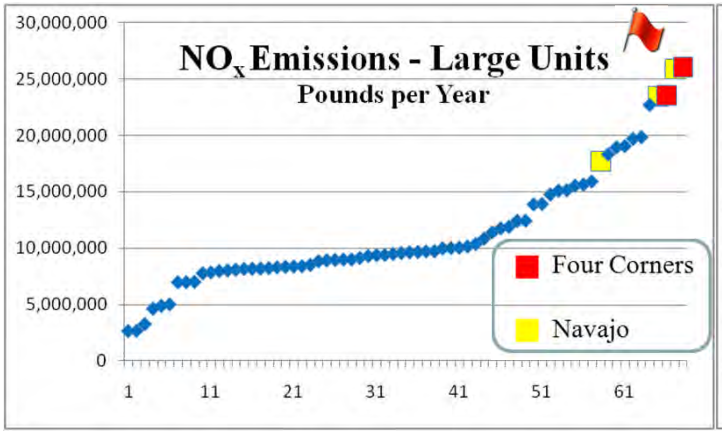


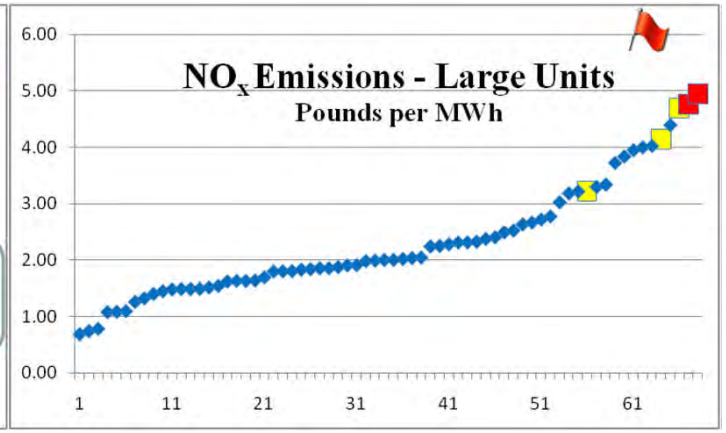
- Cholla 1, whose tons per year is below the industry due to its size, is exhibiting an upward trend in both total emissions and emissions per MWh
- Cholla 2 and 3 exceed the industry by more than expected, but Unit 2 has demonstrated substantial improvement on a per MWh basis

Sustainability

NO_x Emissions – Large Units

3 year average – 2007- 09

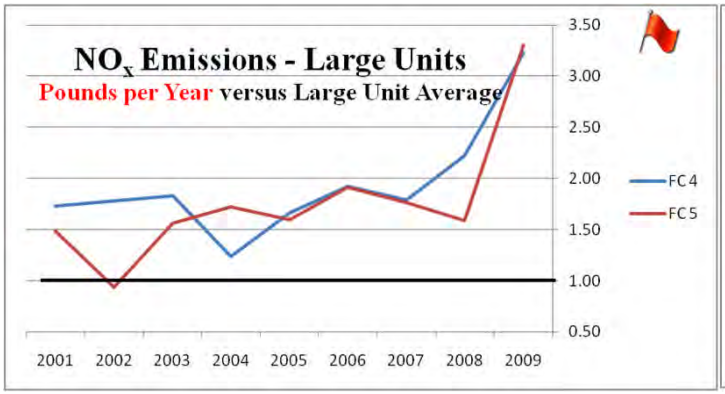


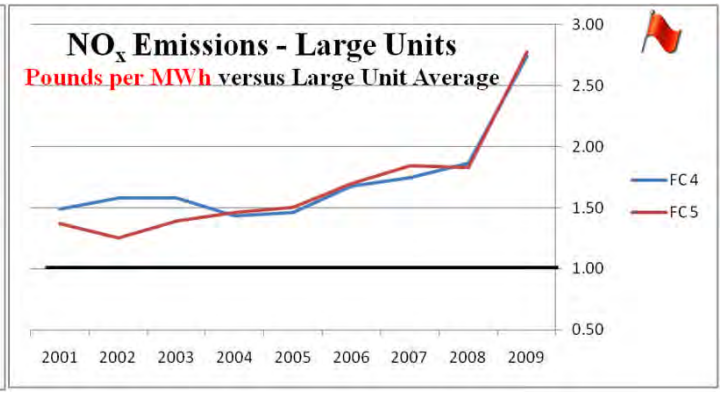


- All 5 large units are in the 4th quartile
- APS units occupy the bottom 3 spots in annual NO_x emissions
- APS units occupy the bottom 3 spots, and 4 of the bottom 5, in NO_x emission per MWh
- Note that, in addition to the low rankings, the absolute value of APS emissions is substantially above the great majority of panel companies

Sustainability

NO_x Emissions – Four Corners

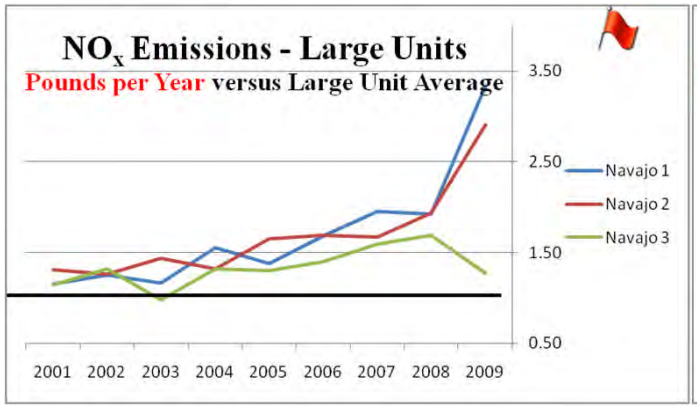


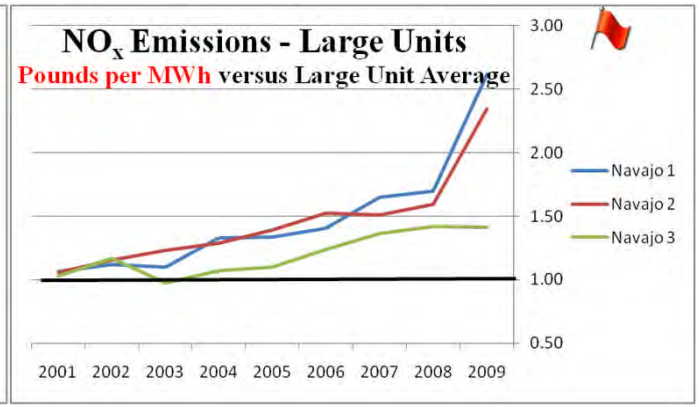


- The large FC units have been well over the industry average, on both an absolute and per unity basis, for quite some time.
- 2009 was a breakout year, for the worse, for both units

Sustainability

NO_x Emissions – Navajo



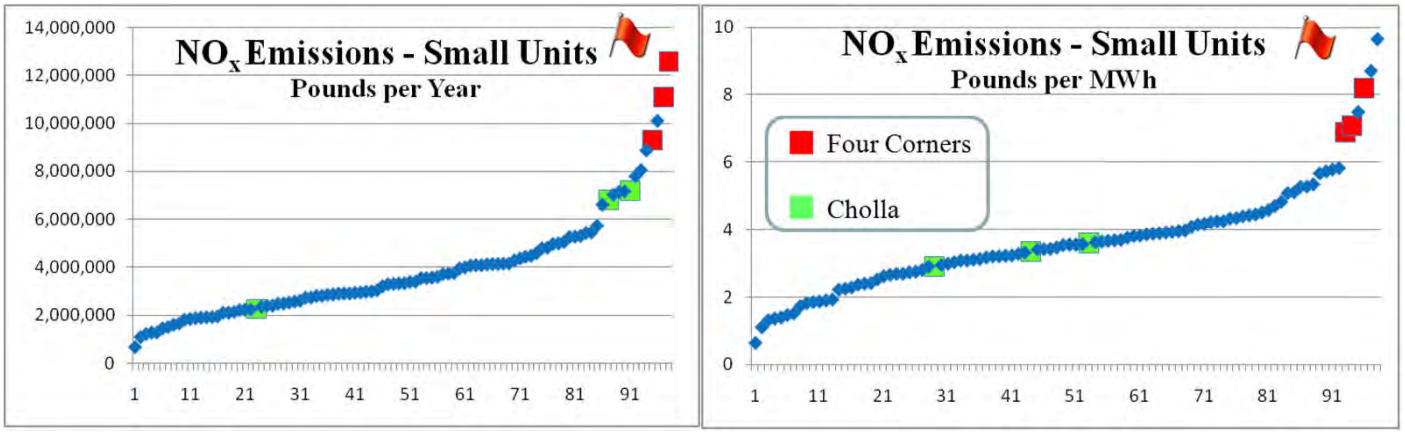


- The Navajo units seem to evidence a trend similar to FC, worsening through the years and a breakout for the worse in 2009
- Navajo 3 is the only unit that did not spike upwards in 2009

Sustainability

NO_x Emissions – Small Units

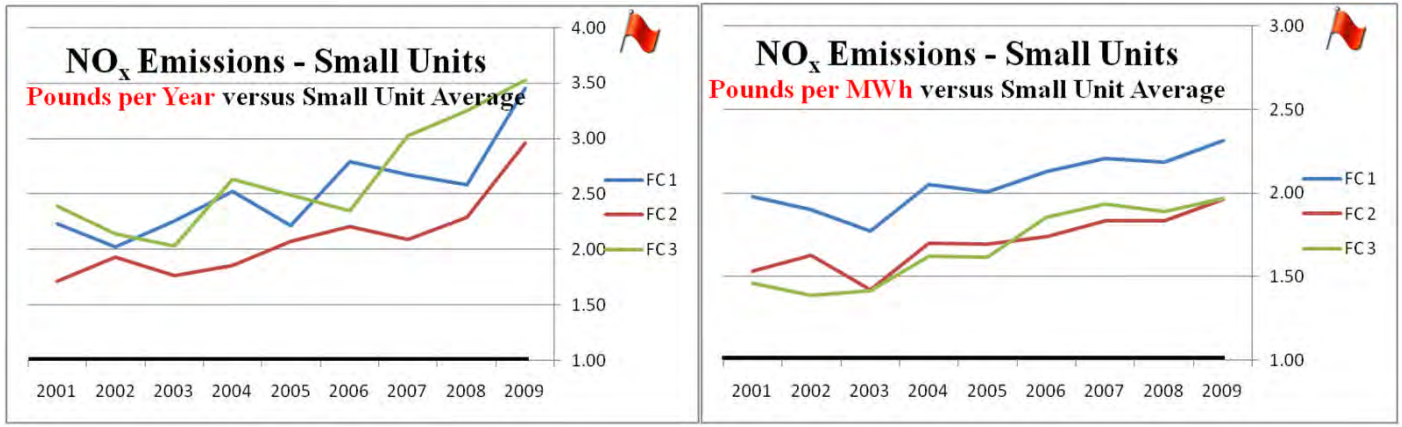
3 year average – 2007- 09



- All of the APS small units are 4th quartile
- On the absolute (left) chart, the positions of the Cholla units seem to be a factor of their size, favorable for 1 and unfavorable for 2 and 3
- The per unit chart (right) backs this up, bringing all three Cholla units into the middle of the pack
- The FC units, in addition to being among the highest in the panel, are above the knuckle of the curve, with emissions several times higher than even other Q4 plants

Sustainability

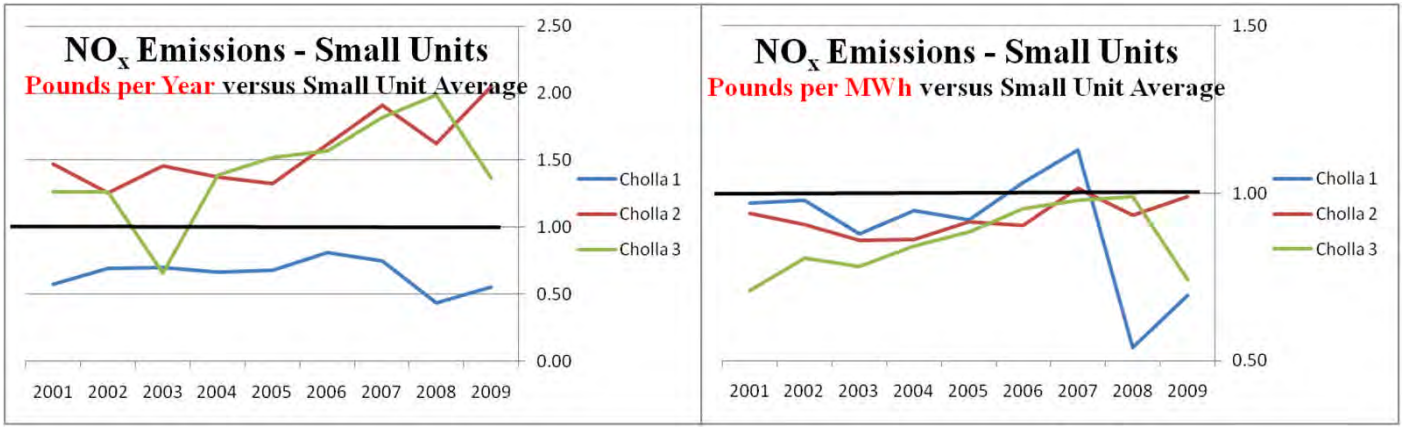
NO_x Emissions – Four Corners



- The FC small units, Q4 in all respects, are well above industry averages for both absolute and per unit emissions.

Sustainability

NO_x Emissions – Cholla

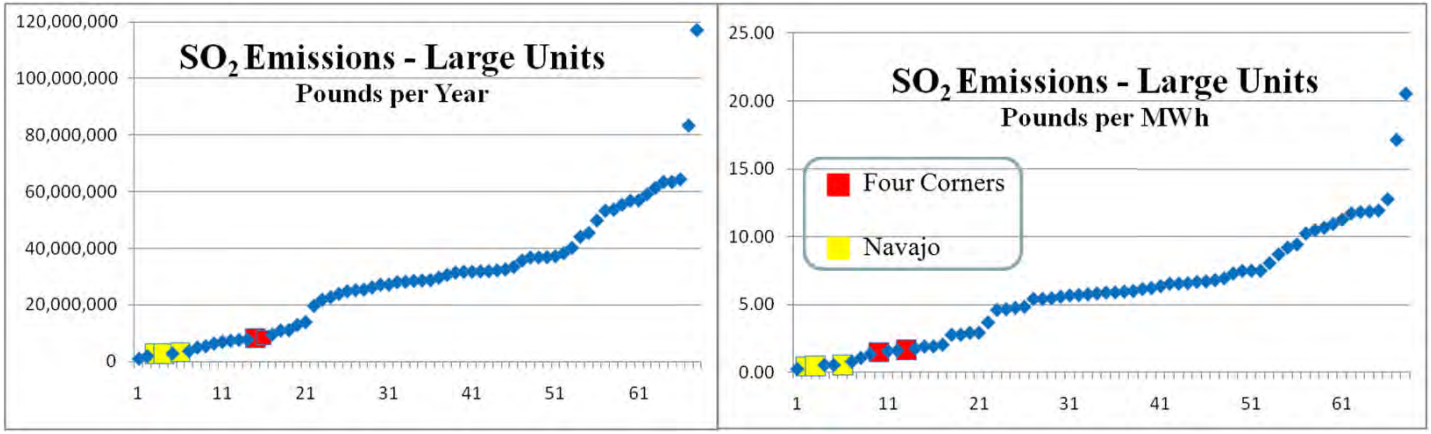


- Cholla emissions are about in line with the industry, differing from average only due to the relative size differences of the units.
- On a per unit basis, emissions are slightly below average

Sustainability

SO_2 Emissions – Large Units

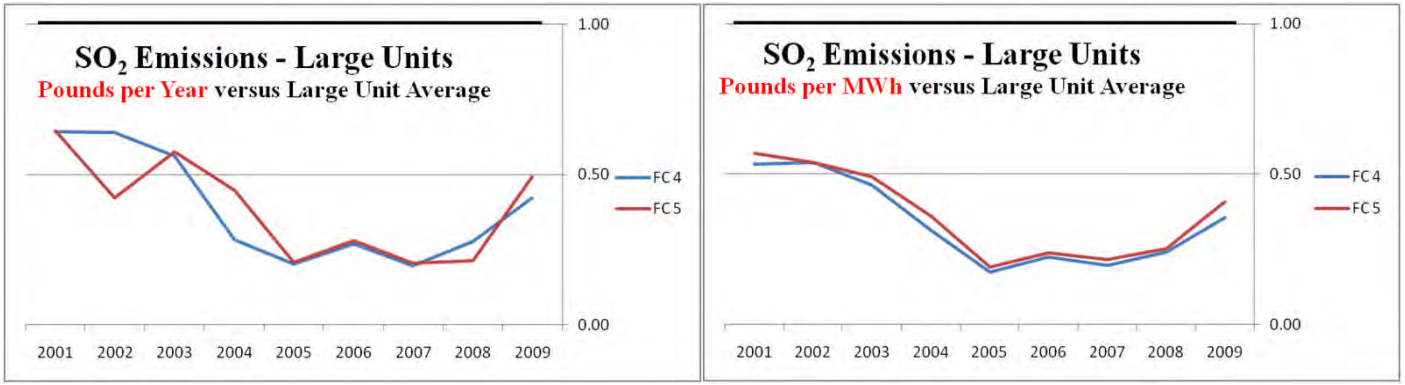
3 year average – 2007- 09



- SO_2 emissions differ considerably from the others – here, APS large units are in the top quartile (lowest emissions)

Sustainability

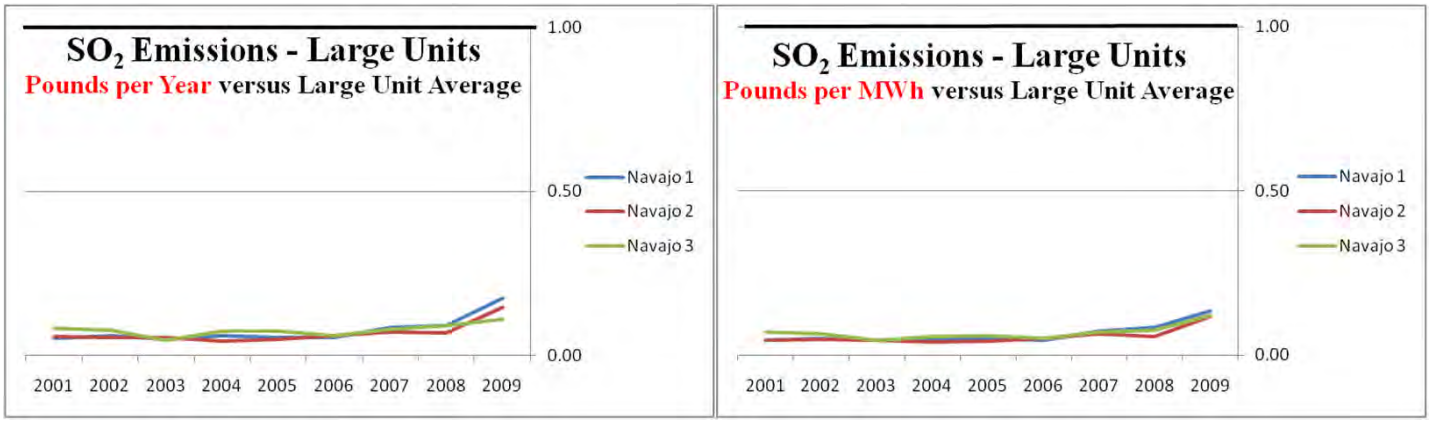
SO_2 Emissions – Four Corners



- Four Corners levels are less than half the industry average

Sustainability

SO_2 Emissions – Navajo

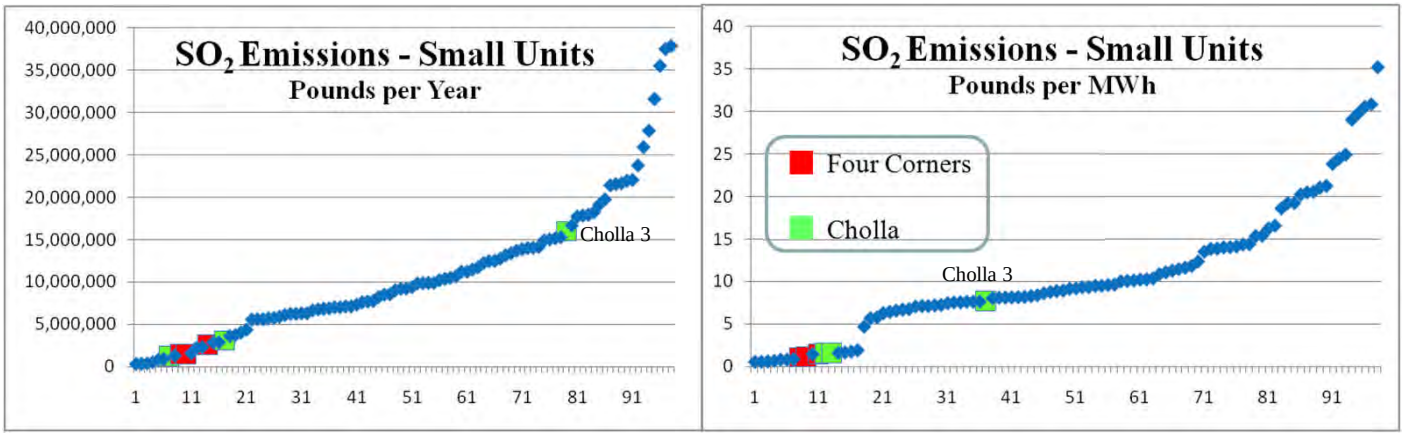


- Navajo levels are under 20% of industry average

Sustainability

SO_2 Emissions – Small Units

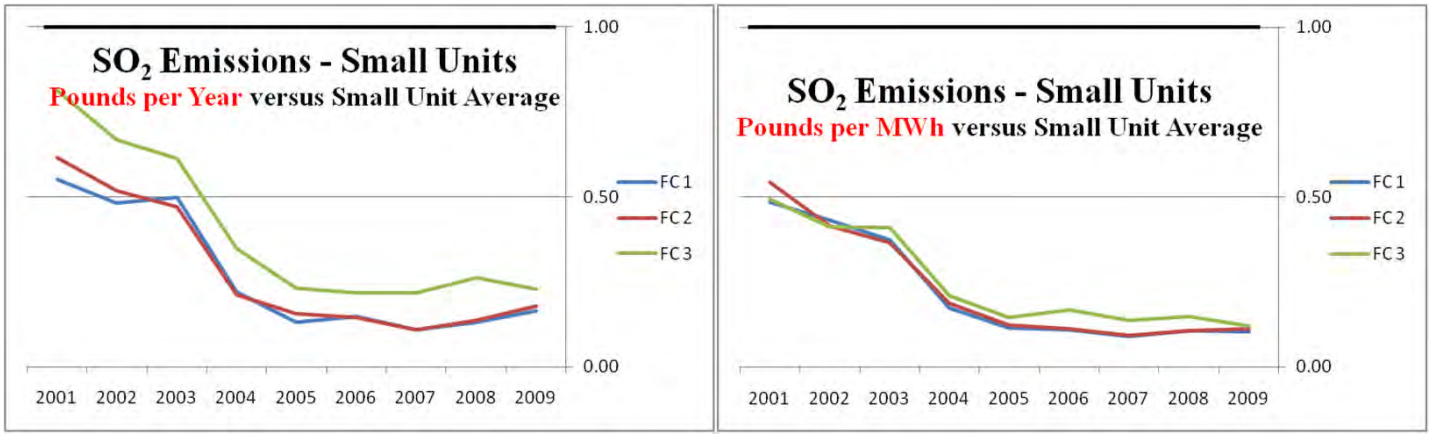
3 year average – 2007- 09



- APS small units are in the top quartile, with the exception Cholla 3, which is clearly an outlier

Sustainability

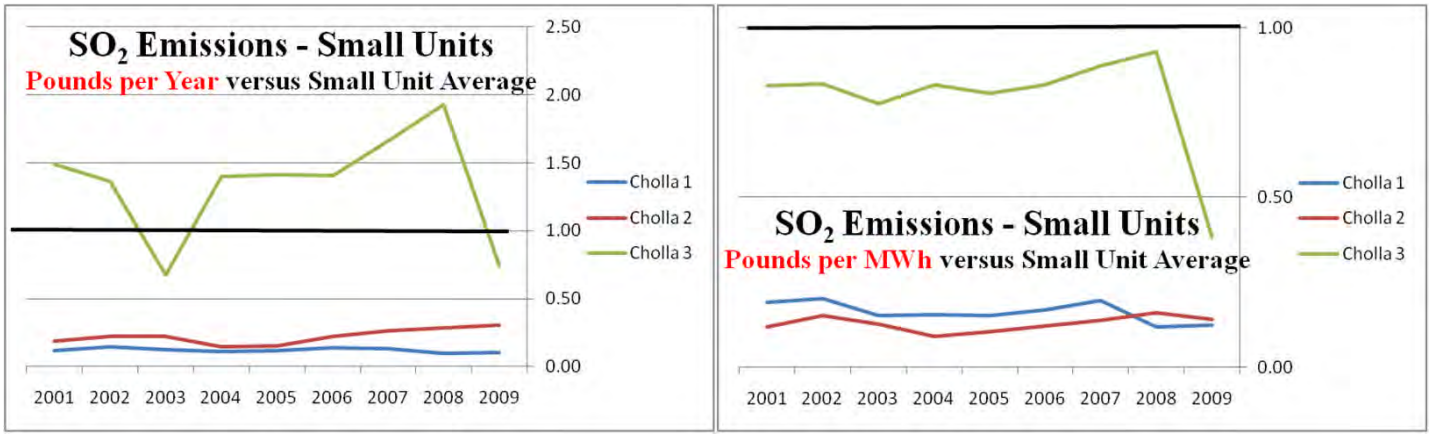
SO_2 Emissions – Four Corners



- FC emissions are about 20% of the industry average

Sustainability

SO_2 Emissions – Cholla



- Cholla emissions are also well below industry averages except for Unit 3.
- Note that Unit 3 performance in 2009 seems to be merging with the other units

Sustainability

Summary of Emissions

Total Emissions - 2007-09 Quartile versus Utility Panels	CO_2	NO_x	SO_2
FC 1	3	4	1
FC 2	3	4	1
FC 3	4	4	1
FC 4	2	4	1
FC 5	3	4	1
Navajo 1	4	4	1
Navajo 2	4	4	1
Navajo 3	4	4	1
Cholla 1	2	1	1
Cholla 2	4	4	1
Cholla 3	4	4	4

Disregard – unduly influenced by size differences within the panel

Emissions per MWh - 2007-09 Quartile versus Utility Panels	CO_2	NO_x	SO_2
FC 1	2	4	1
FC 2	2	4	1
FC 3	4	4	1
FC 4	1	4	1
FC 5	1	4	1
Navajo 1	4	4	1
Navajo 2	4	4	1
Navajo 3	4	4	1
Cholla 1	4	2	1
Cholla 2	3	2	1
Cholla 3	3	3	2

- Potential issues
  - Navajo – CO_2 and NO_x
  - FC – NO_x
  - FC3 – CO_2

Sustainability

Summary of Observations

- Good comparisons are available
  - 2 groups of units, totaling 166, of comparable size
  - Owned by comparable companies
  - With 9 years of comparable data
- Industry emission levels for NO_x and SO_2 are trending down significantly

- The Four Corners and Navajo units are all Q4 in No_x emissions – *to the extreme*
- The Navajo units are all Q4 in CO_2 emissions – *to the extreme*
- FC 3 is Q4 for CO_2

Sustainability

Recommendations

- **None**

- APS's problems here are already highly visible – this analysis merely reinforces what is already known

- Numerous actions are already underway on emission-related issues, including EPA actions and the decision to retire the smaller Four Corners units

APS Benchmarking Analysis

Exhibit VII

Non-fuel O&M

Non-fuel O&M

APS O&M Summary - 2009

O&M Expenses ($000)	O&M	Fuel	Non-fuel O&M
Steam production	363,915	-235,898	128,017
Nuclear production	252,555	-61,765	190,790
Hydro production	2		2
Other production	618,768	-495,804	122,964
Other power supply	440,540		440,540
Sub-total - Power Production	1,675,780	-793,467	882,313
Transmission	46,453		46,453
Distribution	95,644		95,644
Customer expenses	108,316		108,316
A&G expense	166,961		166,961
Sub-total - other	417,374		417,374
Total	2,093,154	-793,467	1,299,687

- All of the significant segments of non-fuel O&M, except for “other power supply” (purchases etc.) and nuclear are covered in this module

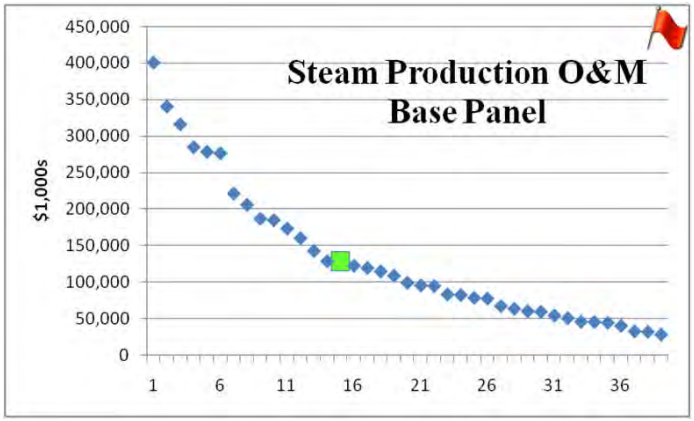
Non-fuel O&M

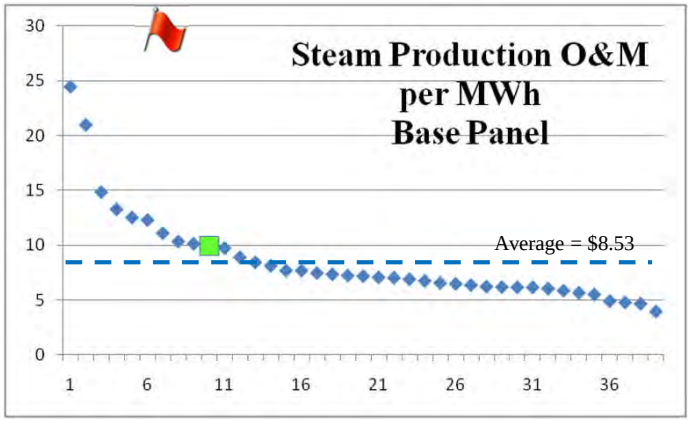
POWER PRODUCTION

- Steam
- Other

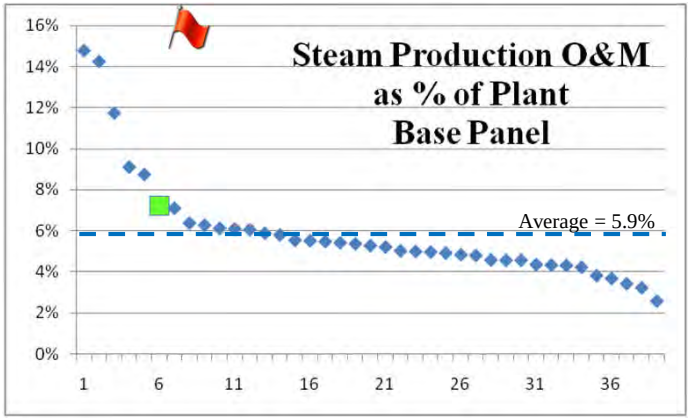
Non-fuel O&M

2009 Steam Production – Non-fuel O&M





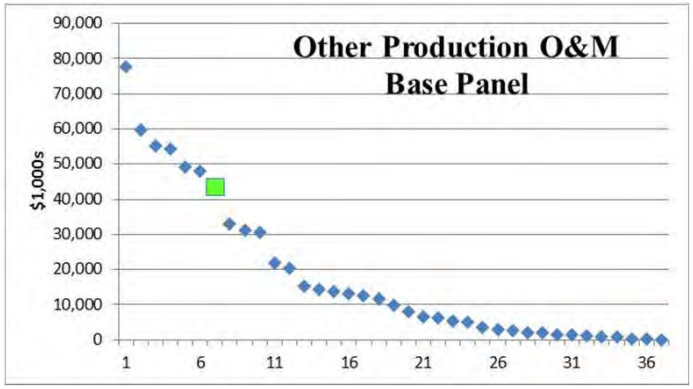
- In terms of steam generation, APS is 22nd in generation but 15th in O&M (top left)
- On a per MWh basis, APS is above the panel average in cost
- Similarly, on a per unit plant basis, APS is above the panel average
- The degree of the suggested overage (~20%) is less than we have seen in some other categories
- It will be recalled from the power plant analysis that APS was "middle of the pack" – the difference here seems to be that, of the partially owned units, APS owns a higher percent of the less efficient units

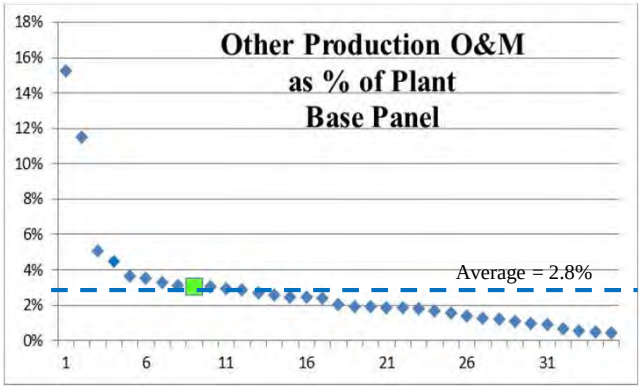


Non-fuel O&M

2009 Other Production – Non-fuel O&M (Less RES)

APS is unique in including the costs of renewables in this account. It is further unique in the large amount of such costs charged. Accordingly, RES costs were removed for APS from this data

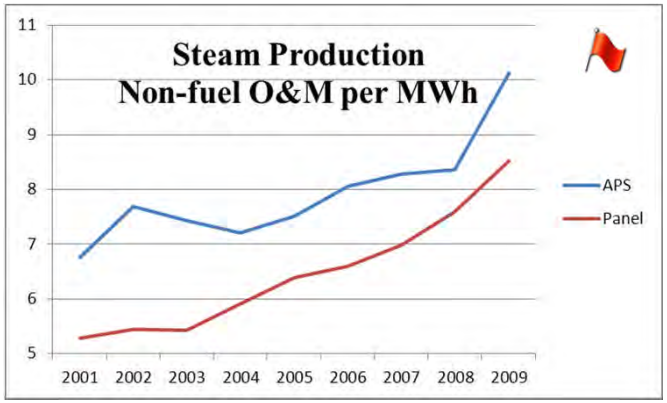


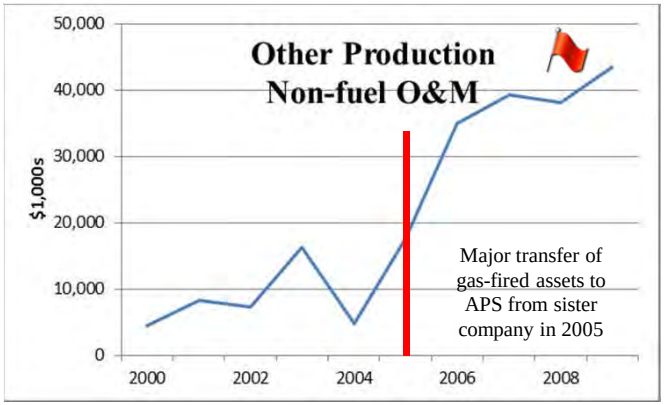


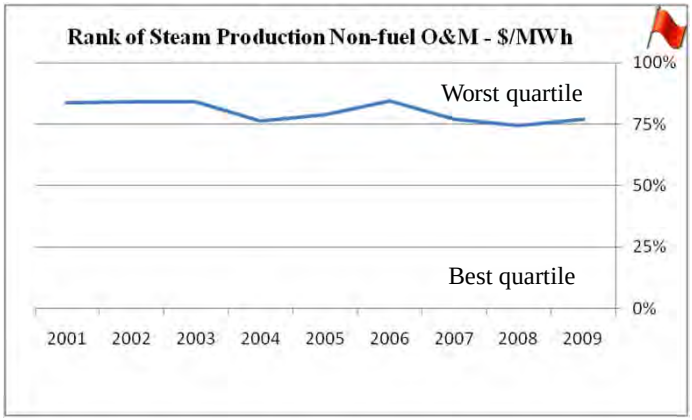
- APS ranks high in 2009 in other production non-fuel O&M even with APS as the only company that has its RES cost removed in the Base Panel (top left)
- It is not meaningful to compare other O&M on a per MWh basis, since the plants in this category vary from very low to very high capacity factors
- APS costs are slightly above average on the basis of costs per dollar of plant (top right) – this is likely more due to the denominator (high investment in plant for the combined cycle units) than the numerator (operating costs)

Non-fuel O&M

Trends in Production – Non-fuel O&M (Less RES)



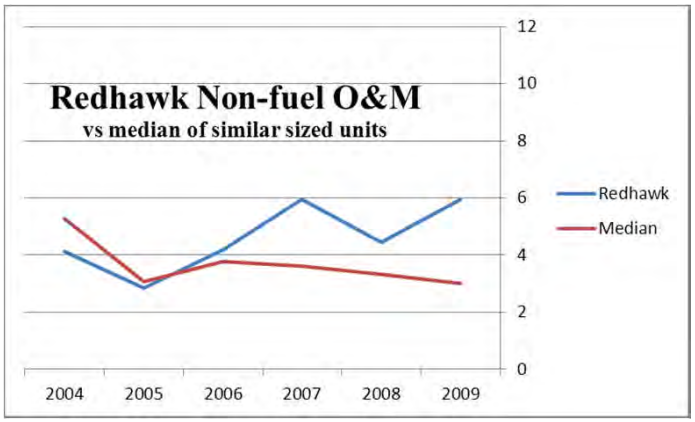


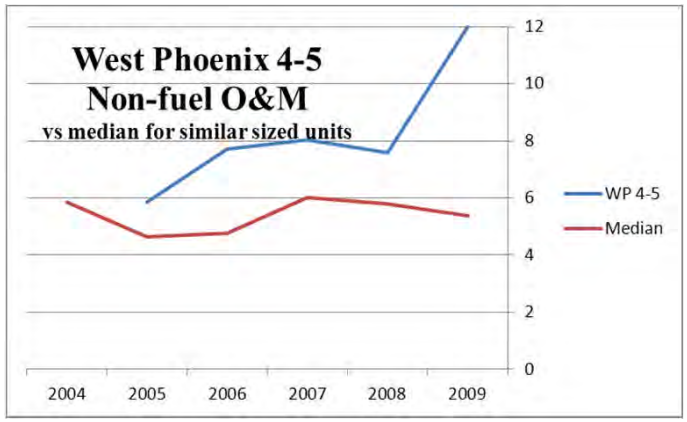


- Steam production costs have been rising faster than the panel, opening a significant gap (top left)
- Steam O&M has been worst quartile throughout the study period
- Panel comparisons for “other production” are not valid due to capacity factor variations, but the magnitude of the increase since additional gas-fired assets were acquired in 2005 raises questions

Non-fuel O&M

Combined Cycle Non-fuel O&M Costs





- APS's 2 large gas-fired combined cycle plants are:
  - Redhawk – 1,007 MW
  - West Phoenix 4-5 – 626 MW
- The medians shown are for all regulated gas-fired CC plants within 30% of the APS plant's size
- Median, rather than average, is a more appropriate benchmark, since some plants with low capacity factors can experience extremely high costs, biasing the average
- The APS plants are well above median and trending away from median

Non-fuel O&M

Analysis of Steam Production Costs

- APS steam (coal) production costs (non-fuel) are consistently in the worst quartile

- APS suggests that the primary drivers of this performance are the same as those discussed earlier for EFORs; i.e., low quality coal and age of the units
- Such a rationale is not unreasonable; however, the magnitude of the APS deviation is simply too large to be dismissed without further analysis

- A more likely explanation is the small unit size, and hence higher unit cost, of the APS fleet. APS owns:
  - 14% of the larger, more efficient units (Navajo and FC 4 and 5)
  - 100% of the smaller, less efficient units (FC 1-3 and Cholla 1-3)
- APS's position will improve with the proposed retirement of FC 1-3 and the planned purchase of a larger share (63%) of FC 4-5.

- In summary, this analysis coupled with the analysis by plant (Exhibit IV) suggests that there is not a cost problem per se, but rather a portfolio problem; i.e., the APS portfolio is dominated by small, less cost-efficient units

Non-fuel O&M

Analysis of Other Production Costs

- For most panel companies, “other” includes gas-fired units, both peaking and combined cycle
- Because of this mix of very different power plants, and drastically different capacity factors, comparisons of benchmarking data is problematic
- Liberty therefore looked at the next level of detail – in this case, specific costs for gas-fired combined cycle plants
- On a size-normalized basis, the large APS plants are consistently above industry median and are trending higher

Non-fuel O&M

Recommendations

- Steam Production Costs (Non-fuel)

  Recommendation 7.1: APS should review its deviation from industry costs and verify if such deviation is due to a bias to small units in its portfolio, in which case no further action would be appropriate. If such is not the case, APS should determine the cause of the deviation.

  – The "portfolio issue" needs no further action as well, since it will likely be solved with the pending ownership changes and retirements at Four Corners.

- Other Production Costs (Non-fuel)

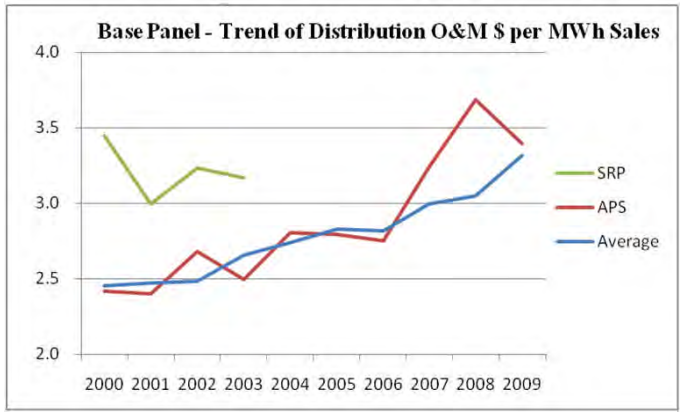
  Recommendation 7.2: APS should analyze non-fuel O&M costs associated with the large combined cycle plants to determine:

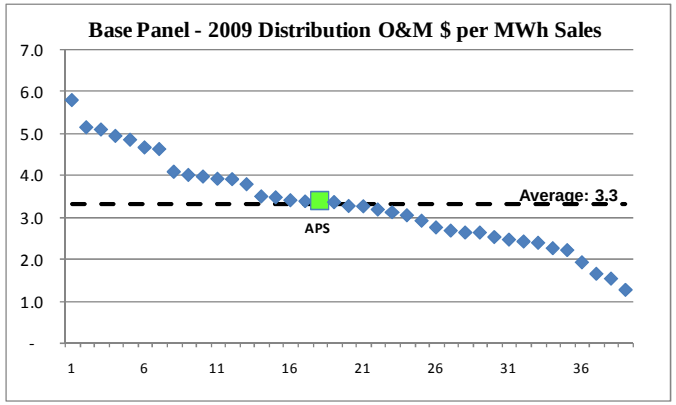
  a) why these units are well above similar units in cost
  b) why the trend in operating costs is upwards, contrary to the industry trend
  c) appropriate corrective measures to reduce operating costs

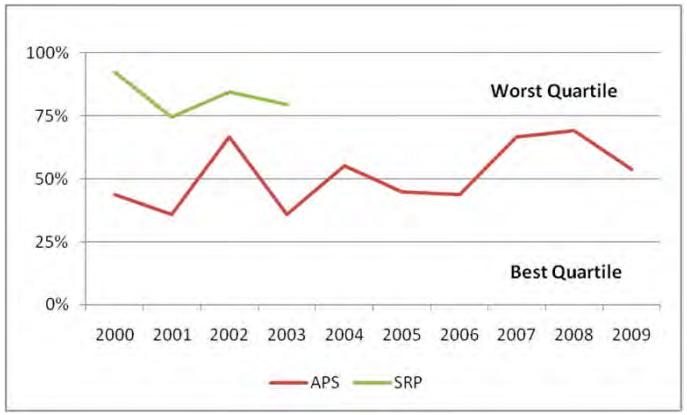
T & D O&M

Non-fuel O&M

Distribution O&M – per MWh Sales



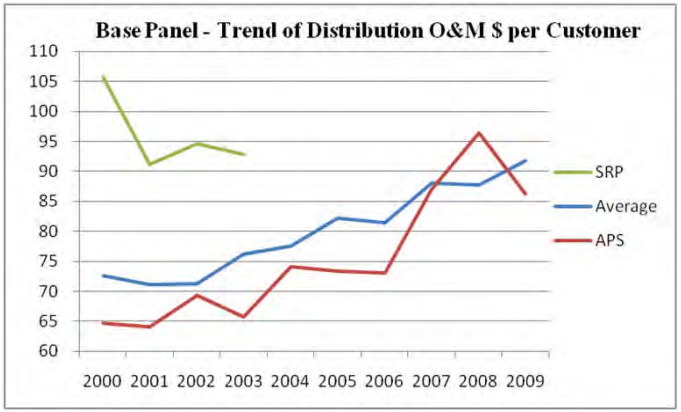


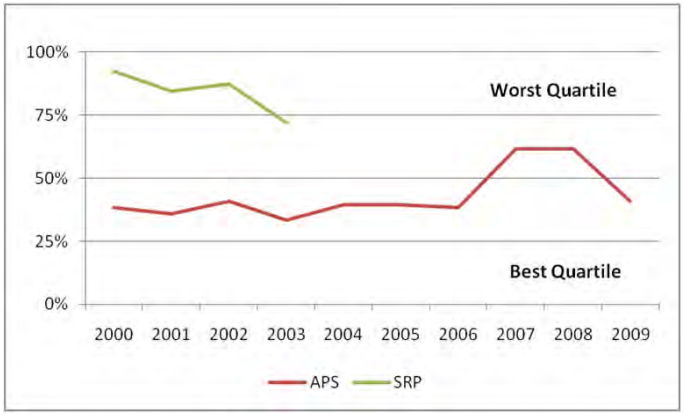


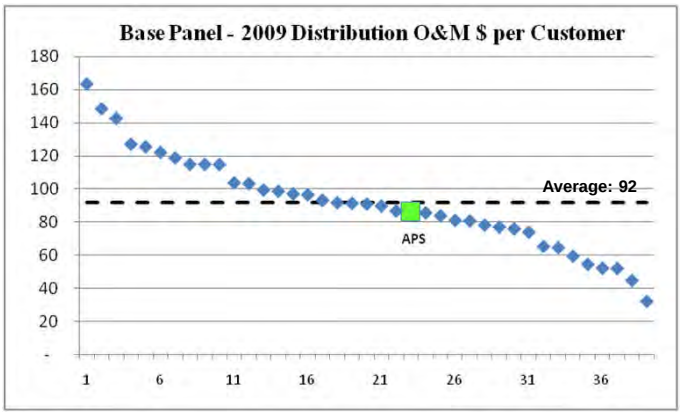
- APS performance appears to be consistently around the mid-point of the base panel
- Note that the panel companies form a generally flat line (top right) such that even minor changes in costs can produce significant changes in rank – this is the reason for the fluctuations in the bottom left chart

Non-fuel O&M

Distribution O&M – per Customer



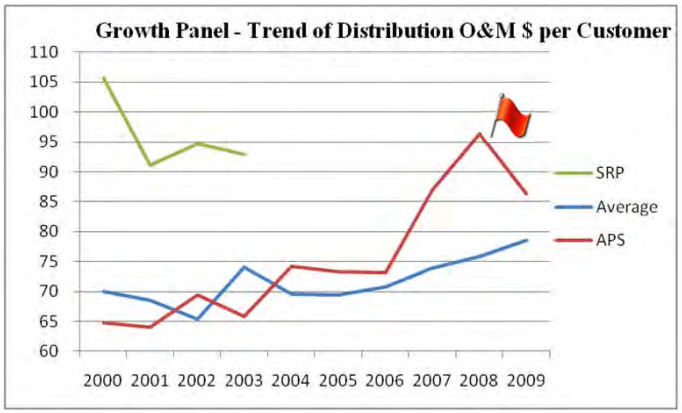


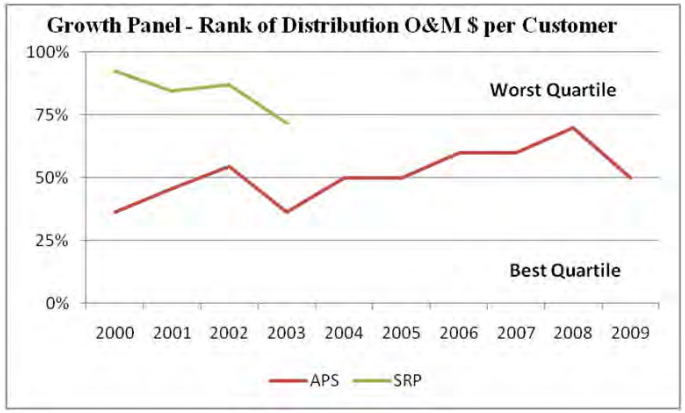


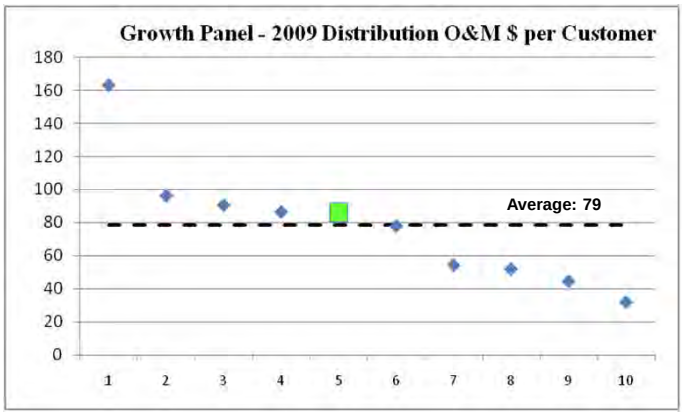
- On a per customer basis, performance improves somewhat
- APS performance is consistently in the 2nd quartile
- The spikes in 2007 and 2008 raise questions, especially since APS was consistently below the average before then

Non-fuel O&M

Distribution O&M – per Customer
Growth Panel







- Notice that average O&M per customer is lower for the growth panel ($79 versus $92 for the base panel)
- As a result, APS standing is a little worse, especially as a result of changes in the last few years
- The APS spike since 2006 appears more drastic when compared to the growth panel, which has been more stable than APS and the base panel

Non-fuel O&M

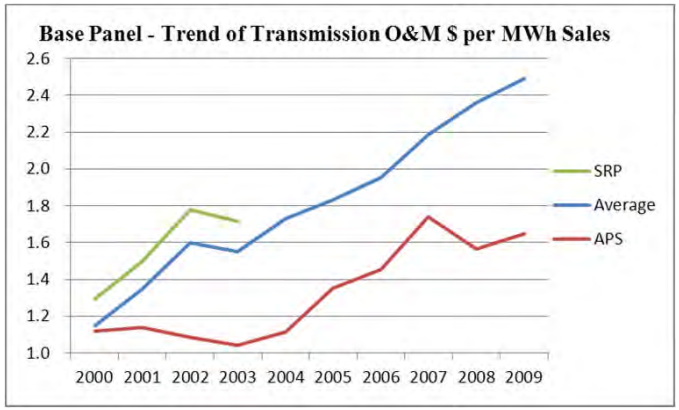
Recommendations

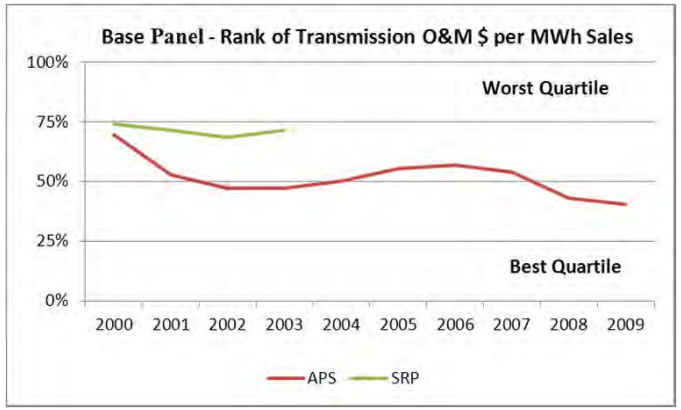
- ***Distribution O&M***

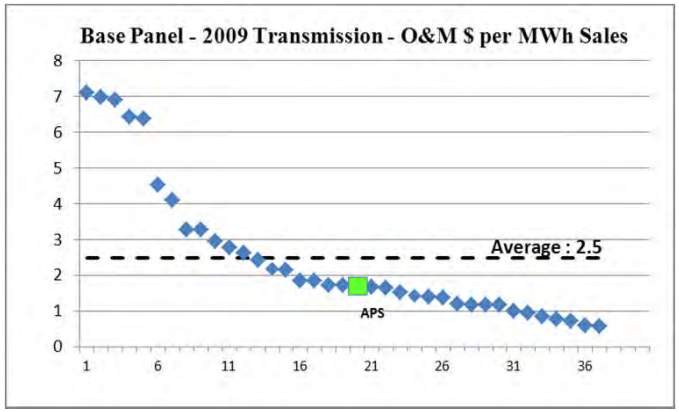
> ***Recommendation 7.3:*** APS should analyze distribution O&M costs to determine the reasons for the sharp increases in 2007 and 2008 and expectations for relative performance in the future.

Non-fuel O&M

Transmission O&M – per MWh Sales



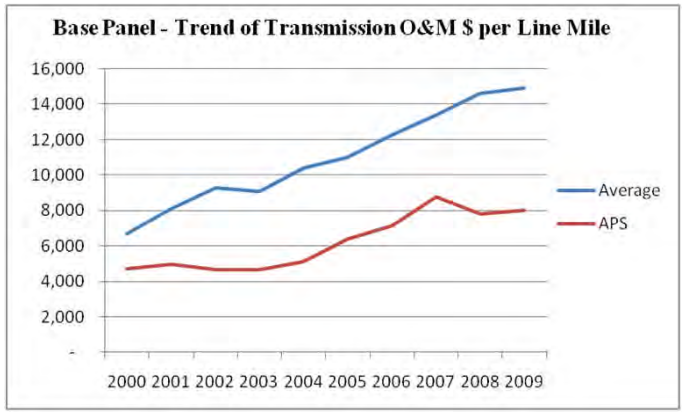


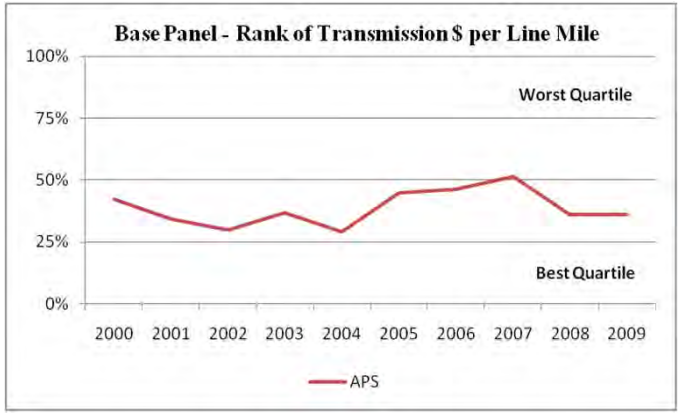


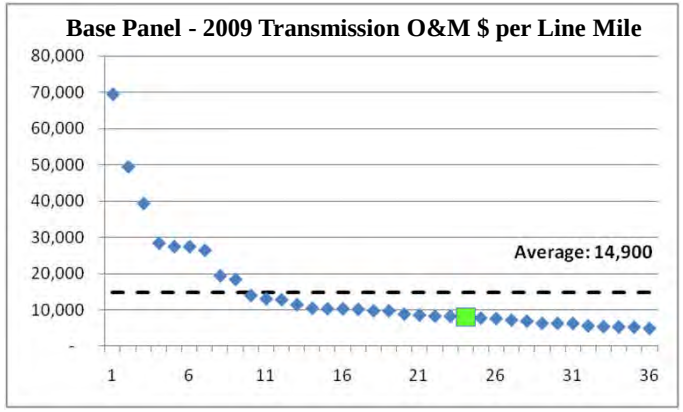
- APS has fluctuated between Q2 and Q3 and is now Q2
- This middle of the pack ranking results in transmission costs that are about 25% less than the panel average

Non-fuel O&M

Transmission O&M – per Line Mile







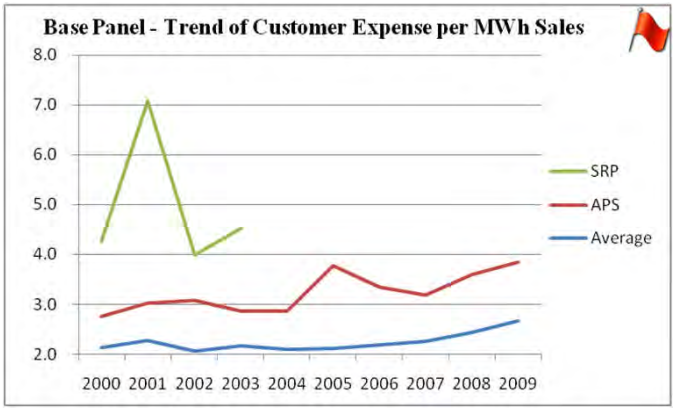
- On a cost per mile basis, APS is well below the panel average (top left)
- APS is consistently in the 2nd quartile (top right)
- Other than the top 7 utilities, all of the panel members are grouped in a narrow range (bottom left), making the average a not very useful benchmark

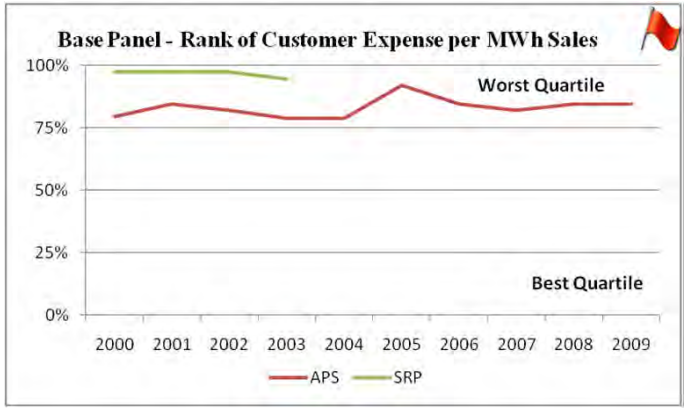
Non-fuel O&M

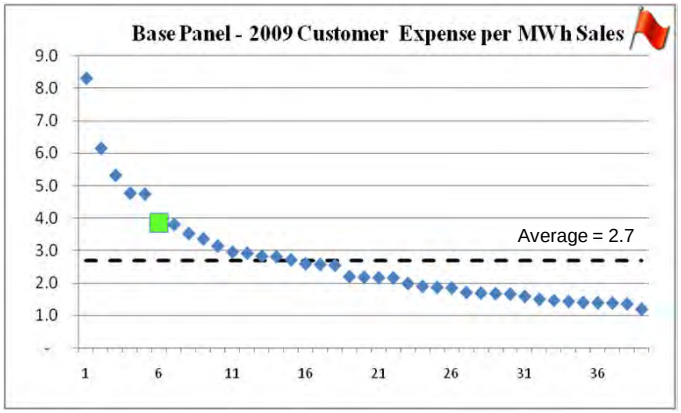
CUSTOMER EXPENSE

Non-fuel O&M

Customer Expense – per MWh Sales





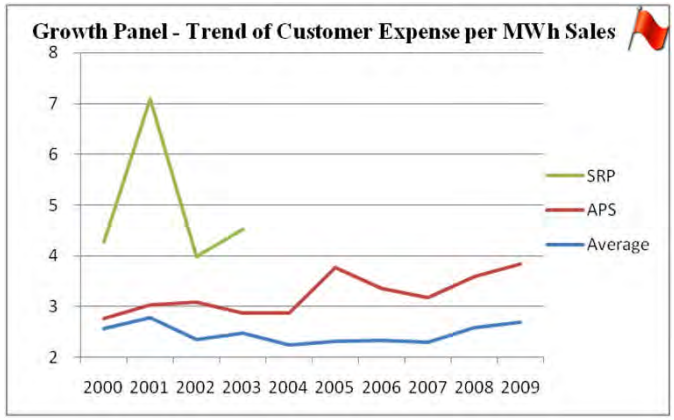


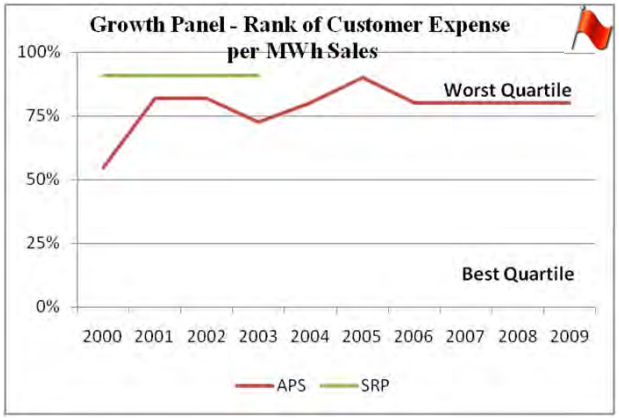
- Customer expense is high in the panel to the extreme.
- APS has previously attributed this at least in part to an extremely high customer turnover

Customer expense = Customer accounts
+ Customer service
+ Sales expense

Non-fuel O&M

Customer Expense – per MWh Sales
Growth Panel

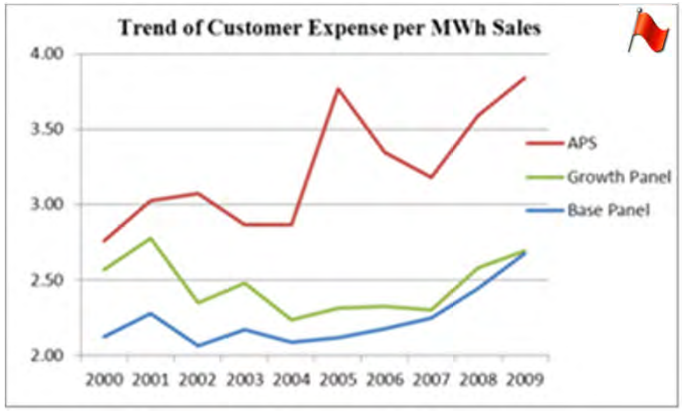


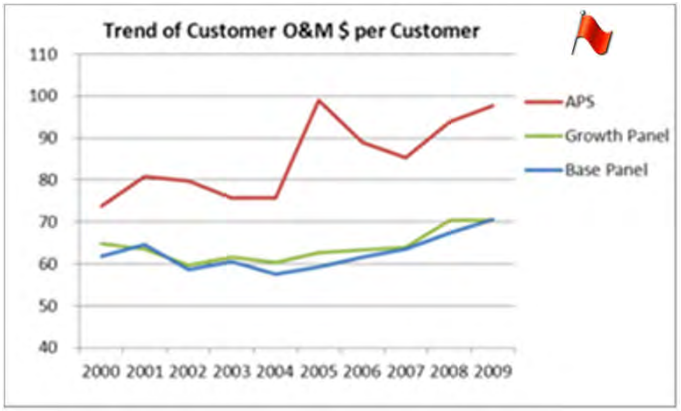


- The APS position does not improve when limited to the growth panel
- APS is still in the 4th quartile

Non-fuel O&M

Customer Expense
Base versus Growth Panels





- These charts demonstrate that there is no basis to assume high customer expenses result from high growth.
- The averages for the base and high growth panels are about the same
- And APS costs are 43% and 39% higher respectively than the per unit sales and per customer comparisons

Non-fuel O&M

Analysis of Customer Expense

- Customer expense is high in the panel to the extreme.
- The consistent 4Q rank does not change when limited to high growth utilities

- APS attributes this overage to:
  - Scope
    - DSM
    - CRCC
  - APS characteristics
    - High customer growth
    - Transient nature of customers
    - More rate options

- If DSM and CRCC are fully removed, which is probably inappropriate, APS costs are about equal to the industry average
- The “APS characteristics” explanations are problematic
  - The growth panel utilities share APS’s high growth and probably some of the transient characteristics, yet APS still compares unfavorably
  - The UMS report made clear that the higher workload from these factors is not the only driver of higher costs

Non-fuel O&M

Analysis of Customer Expense
Additional Observations

- The UMS report suggested that the growth and transients issues were “worthy of further study”. It does not appear that any further study was done, hence it remains unclear just to what extent these factors contribute to higher relative costs

- UMS also referred to the following as drivers of higher costs:
  - Duplication in web transactions
  - Lack of first call response
  - Decline in field service productivity

  Again, there is no quantitative assessment of the impact

- APS is making a huge investment in AMI (500,000 meters installed so far), but there is no assessment available of the reductions in customer expense that this investment is producing, or will produce

- The company has provided a list of real and credible improvements made in this area, some of which should have been expected to improve cost performance

Non-fuel O&M

Recommendations

- **Customer expense**
  - APS has relied on a series of traditional explanations for why its customer expense is high versus others
  - While these explanations have at least some validity, it is by no means clear that they paint a complete picture – and quantitatively, they paint no picture at all
  - Improvement actions have been good, but there is no evidence or estimate of cost benefits
  - Performance may or may not eventually prove to be a problem; however, it is a problem if the company is not able to effectively judge its own performance

- **Recommendations**

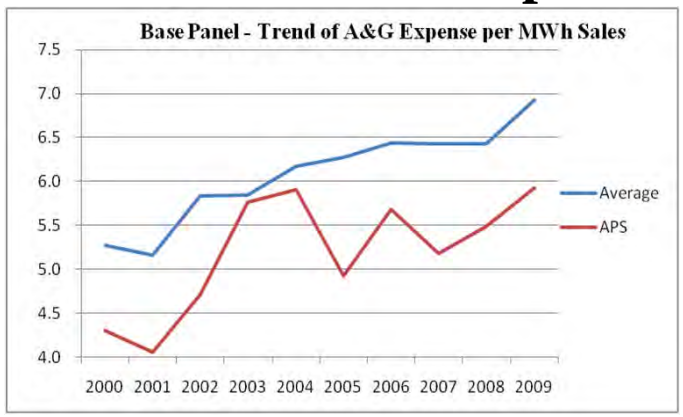
Recommendation 7.4: APS should determine, on a quantified basis, the specific reasons for its deviation from other utilities in the categories of customer expense. Such an analysis should include, at least, consideration of the UMS work, the Hackett work and the impact of the AMI project.

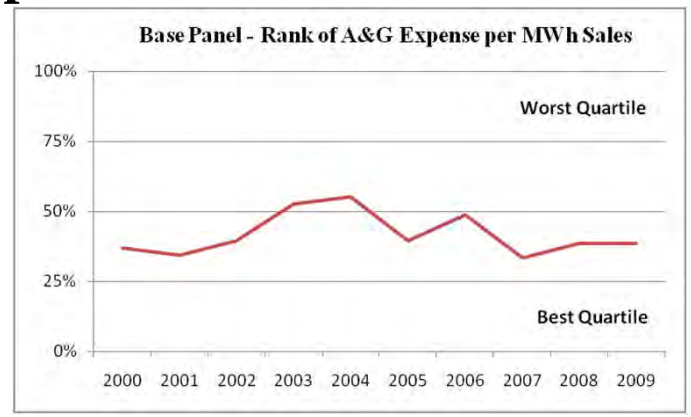
Non-fuel O&M

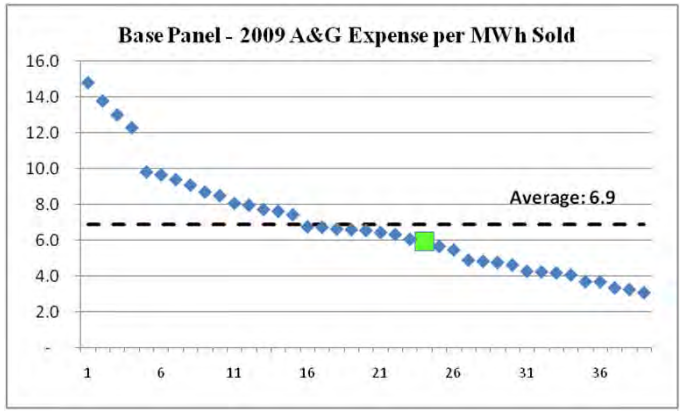
A&G EXPENSE

Non-fuel O&M

A&G Expense – per MWh Sales



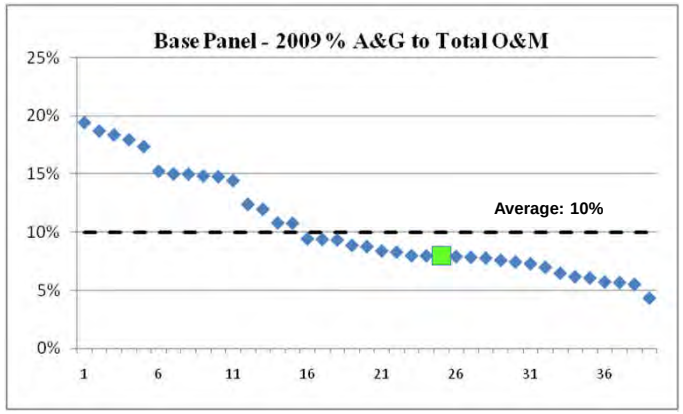


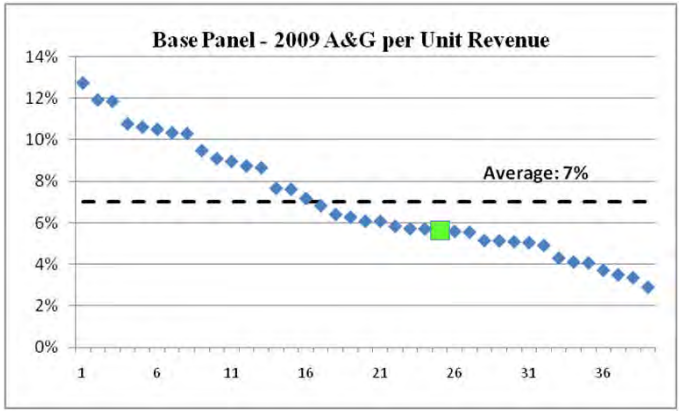


- APS has a favorable rank in A&G
- Costs are below panel average
- Rank is consistently Q2

Non-fuel O&M

A&G Expense Ratios





- APS is well below the panel averages in traditional A&G ratios

Non-fuel O&M

TOTAL ELECTRIC O&M

EXCLUDING POWER PRODUCTION COSTS

Non-fuel O&M

O&M Summary

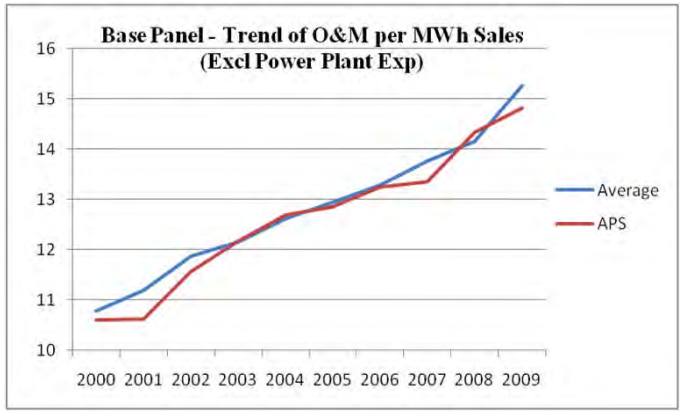
- Total O&M (excluding power production), should be expected to be in line with industry averages and perhaps a little better
- The category is weighted highest in A&G in which APS has a favorable position, somewhat offset by the relatively high customer expenses

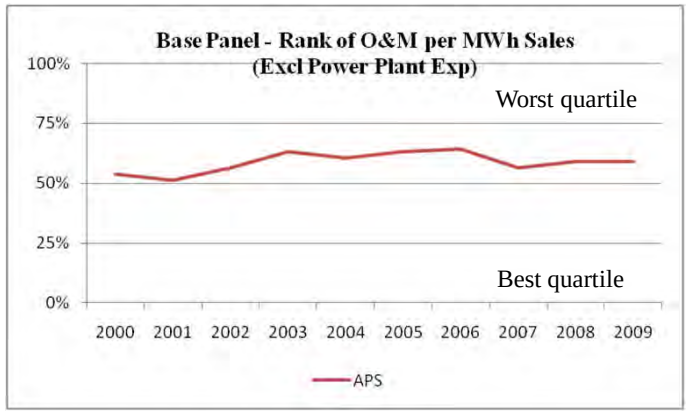
	Versus Panel Average	Quartile	
Transmission	Low	2	**11%**
Distribution	Average	2-3	**23%**
Customer	High	4	**26%**
A&G	Low	2	**40%**

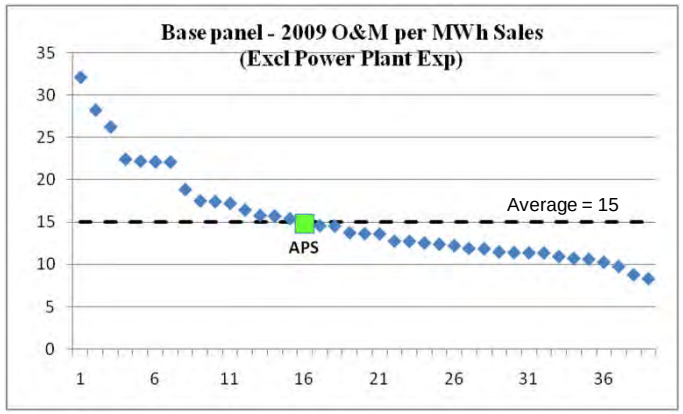
Non-fuel O&M

Total O&M – per MWh Sales

Excluding Power Production





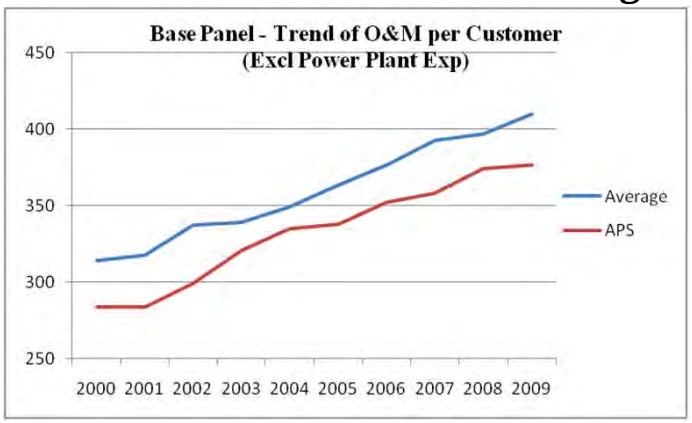


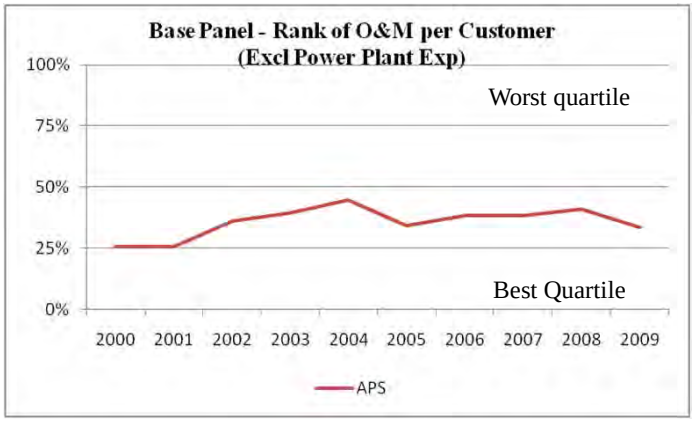
- On an MWh basis, O&M expenses are slightly below average
- Ranking has consistently been 3rd quartile

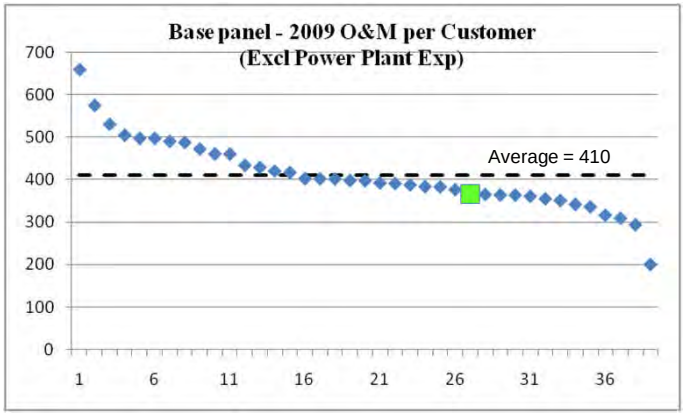
Non-fuel O&M

Total O&M – per Customer

Excluding Power Production







- As usual, APS's position includes on a per customer basis versus a sales basis
- Costs are below panel average
- Ranking is solid 2nd quartile

Non-fuel O&M

Summary of Observations

- Steam production costs are above the panel average, by about 20%
  - When viewed on a power plant basis, APS is “middle of the pack”, suggesting that the 100%-owned units are higher cost
- Other production costs are above the panel average – *to the extreme*
- Other production costs are rising extremely fast
- Distribution costs are mid-pack – there has been a spike since 2006
- Transmission ranks in the middle, but costs are well below the panel average
- Customer expenses are high by all measures
- A&G expenses are low compared to the panel – APS is 2nd quartile

APS Benchmarking Analysis

Exhibit VIII

Capital

Capital

Focus of Analysis

- Plant account represents accumulated investments in plant over decades
- Investments were added to rate base in the past, and presumably evaluated and proved appropriate at that time
- For our purposes, the absolute level of plant account is therefore of academic interest only at this time, as such costs are sunk
- More important is the recent trend of additions to plant – is the level of the company's capital expenditures
  - More than others, and perhaps more than needed?
  - Less than others, and perhaps insufficient to maintain service?

- Our analysis will therefore focus primarily on new investments over the study period

Capital

Capital Investment

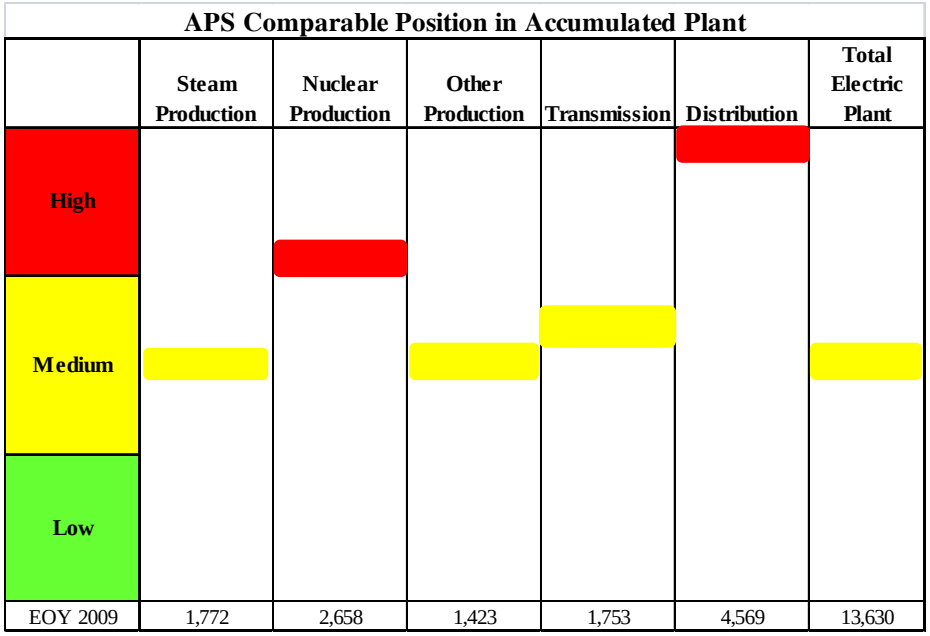
	Steam Production	Nuclear Production	Other Production	Transmission	Distribution	Sub-total	Other	Total Electric Plant
EOY 2000	1,233	2,346	171	892	2,645	7,287	747	8,034
2001	22	-3	17	82	193	312	61	374
2002	41	9	14	71	173	309	89	397
2003	42	161	1	111	175	490	-79	411
2004	38	-18	2	52	196	270	130	399
2005	41	59	1,089	119	235	1,543	98	1,641
2006	31	2	18	81	279	411	94	505
2007	62	5	10	110	287	474	255	729
2008	77	45	77	88	245	532	91	623
2009	186	51	22	147	141	548	-30	517
							0	
9 year total	539	312	1,251	861	1,924	4,888	708	5,596
	44%	*13%*	*730%*	*97%*	*73%*	*67%*	*95%*	*70%*
EOY 2009	1,772	2,658	1,423	1,753	4,569	12,175	1,455	13,630

- In this segment, we will examine:
  - Total electric plant additions
  - Steam production plant additions
  - Nuclear production plant additions
  - Other production plant additions
  - Transmission plant additions
  - Distribution plant additions

- The RFP requires a special look at distribution, including analysis on the basis of new customers.

Capital

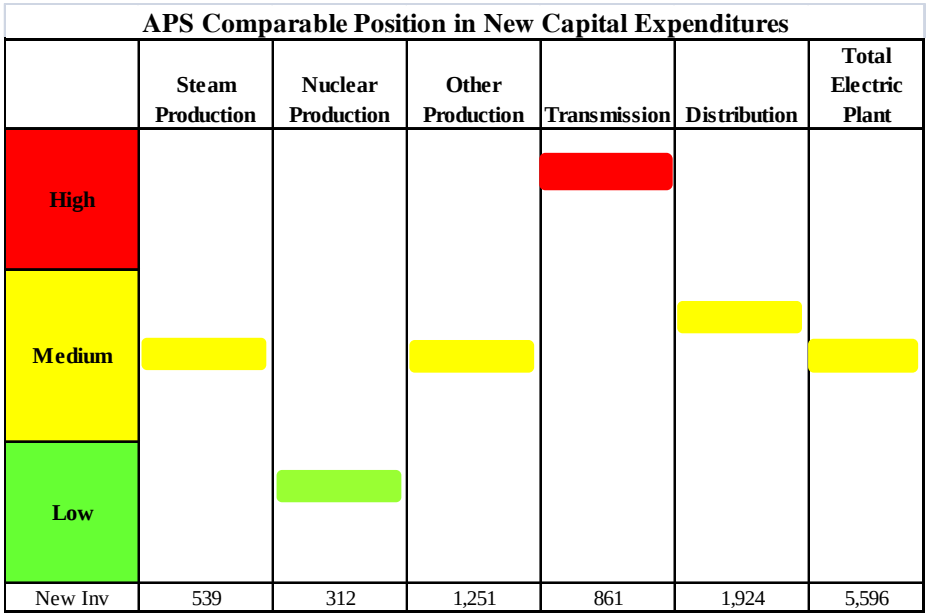
Accumulated Plant Investment
Summary of APS Comparative Position



- As a preview of the analysis to follow:
  - Distribution investment by APS is above the industry expectations, in the extreme
  - Nuclear is above expectation
  - All others are about where they should be expected to be

Capital

New Capital Expenditures (2000-2009)
Summary of APS Comparative Position



- As a preview of the analysis to follow:
  - New expenditures for transmission are well above industry average
  - New investment for distribution is well above industry average, but is expected due to APS's high growth rate
  - Nuclear expenditures are slightly below average

Capital

Panel Development

- The standard base panel is utilized with three exceptions
  - SRP data is not available in sufficient detail
  - Two other utilities had aberrant patterns or missing data
  - The resulting panel is 37 electric-only utilities with characteristics similar to APS
- The high growth rate panel is used
  - The top 10 utilities from the standard base panel in terms of annual sales growth between 1999-07[1]
  - SRP was replaced by the 11th cede
- The regional panel is used
  - Standard panel utilities (8) in or next to Arizona, excluding SRP

[1] 2008-09 was not considered due to the drop in the economy and its distortion of growth patterns

Capital

Expectations

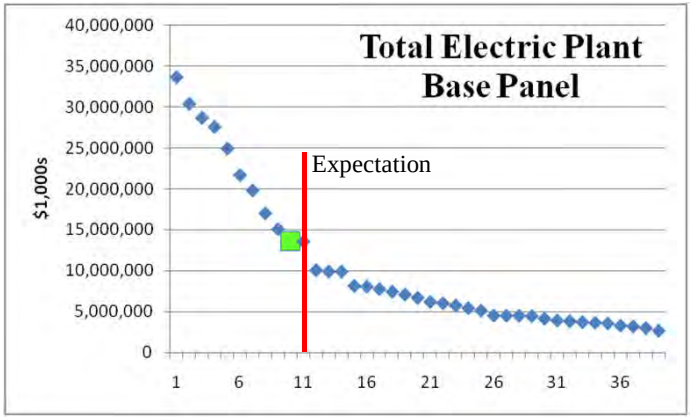
- It is first helpful to gauge the place of APS in the panel in order to anticipate where various results should come out
- In comparison to the base panel, APS is ranked:
  - 11th in revenue
  - 11th in number of customers
  - 13th in kwh sales
  - 10th in electric plant
  - 12th in peak load
  - 10th in transmission miles
- This is a very consistent picture that allows us to conclude that APS is about 11th in overall size in the panel, with all key parameters falling within 10-13
- In size-related parameters, we would therefore expect to see APS around the 11th spot

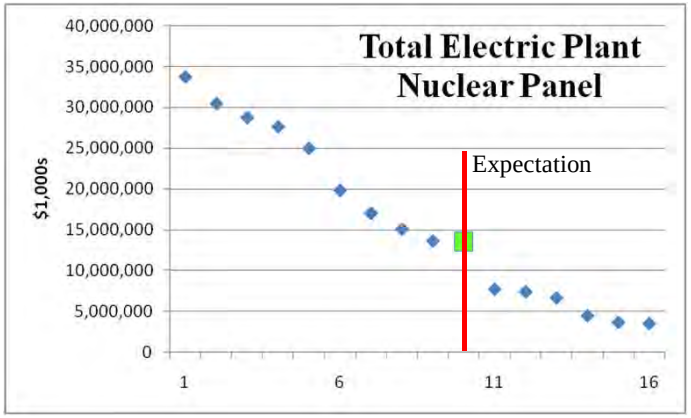
Capital

Total Electric Plant

Capital

Total Electric Plant

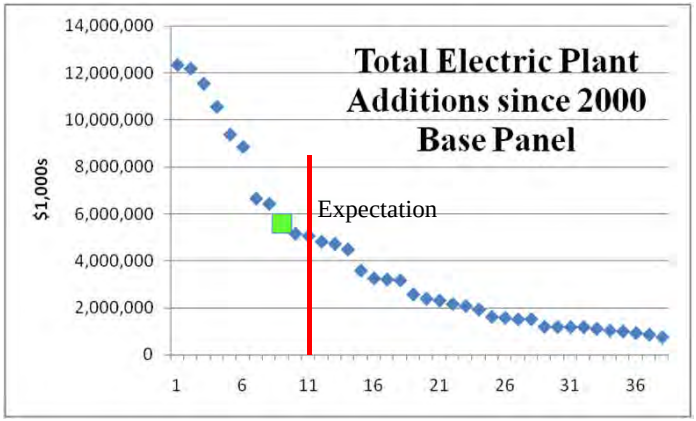


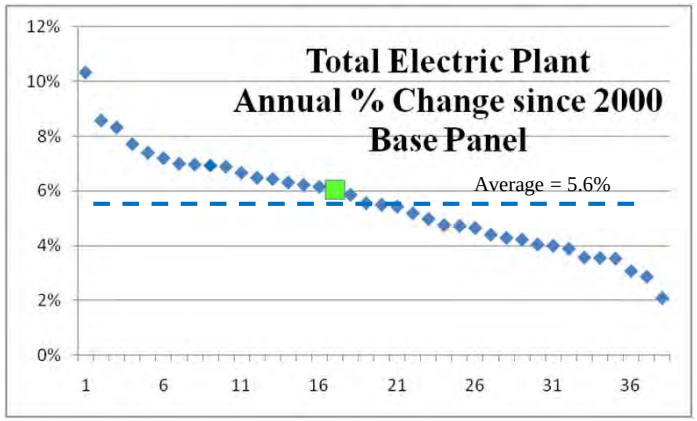


- We would expect APS to be in the familiar 11th range on the left chart, and that is about where it is (10th)
- Comparison with the nuclear panel (right chart) is probably more appropriate, and here APS is exactly where expected (10th)

Capital

Additions to Total Electric Plant 2000-09



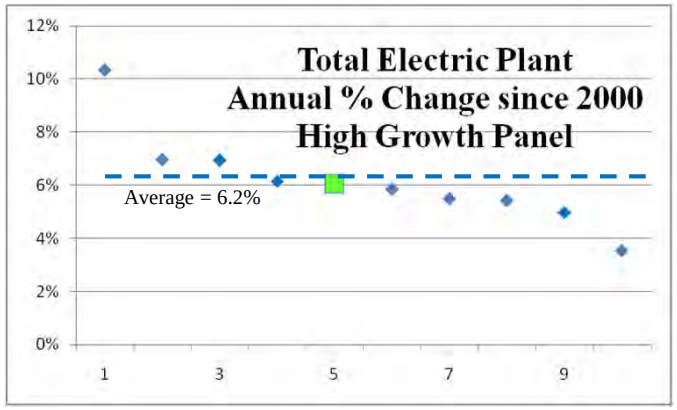


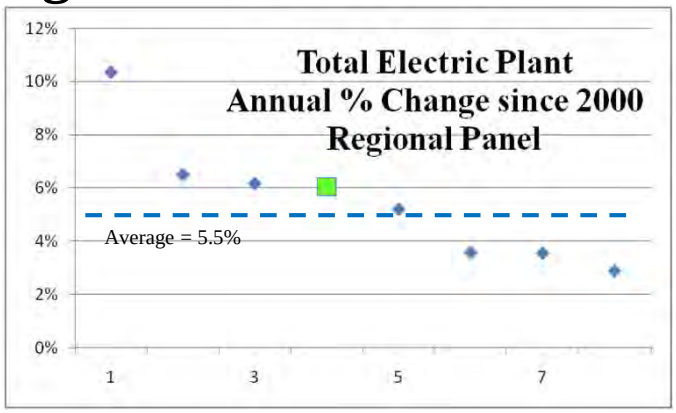
- APS additions are slightly above base panel expectations
- Electric plant has grown at 6% per year compared to the base panel's 5.6%

	Total Electric Plant
EOY 2000	8,034
2001	374
2002	397
2003	411
2004	399
2005	1,641
2006	505
2007	729
2008	623
2009	517
9 year total	5,596
	70%
EOY 2009	13,630

Capital

Additions to Total Electric Plant
Hi-Growth and Regional Panels





- A more appropriate comparison is versus the high growth panel – here APS is right in line with the other firms and essentially having the same annual growth rate in electric plant
- As might be expected, the regional panel has slower growth and approximates the base panel

In summary, APS's annual investment in total electric plant is in line with industry results and what should be expected; i.e., slightly higher than the base and regional panels and equal to the high growth panel.

Capital

Fuel Mix

- In the slides that follow, we will evaluate investment in generation – to do so, one must first understand the fuel mix utilized by APS and how it compares to the panel companies

	APS	Base Panel	Steam Panel	Nuclear Panel
% Self-generated	80%	73%	74%	78%
% Steam	46%	71%	70%	51%
% Nuclear	33%	16%	16%	37%
% Hydro	0%	3%	3%	2%
% Other	21%	10%	10%	10%

- Fuel mix obviously plays a large part in determining investment needs for production plant, and production plant dominates total investment needs
- APS's fuel mix aligns closely with that of the nuclear panel, and not so well with the other panels
- Only 17 utilities (after removing SRP) from our base panel of 40 qualify for the nuclear panel
- APS enjoys a healthier fuel diversity than the panels

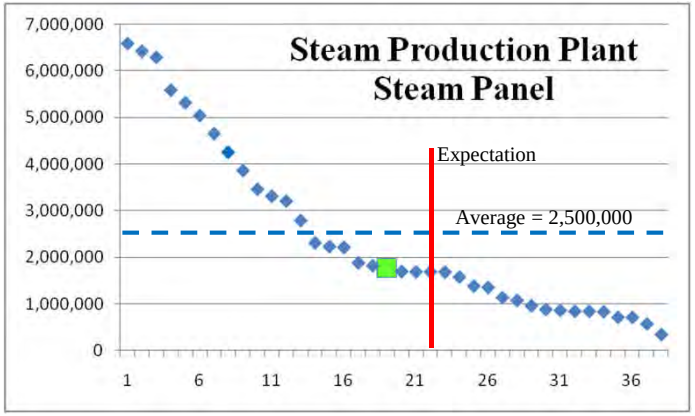
Alabama Power Company
Arizona Public Service Company
Carolina Power & Light Company
Detroit Edison Company
Duke Energy Carolinas, LLC
El Paso Electric Company
Entergy Arkansas, Inc.
Entergy Louisiana, LLC
Florida Power & Light Company
Florida Power Corporation
Georgia Power Company
Indiana Michigan Power Company
Kansas City Power & Light Company
Kansas Gas and Electric Company
Public Service Company of New Mexico
Southern California Edison Co.
Virginia Electric and Power Company

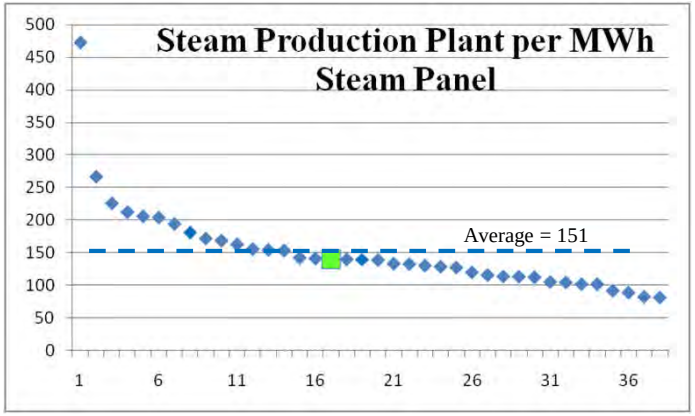
Capital

Steam Production Plant

Capital

Steam Production Plant

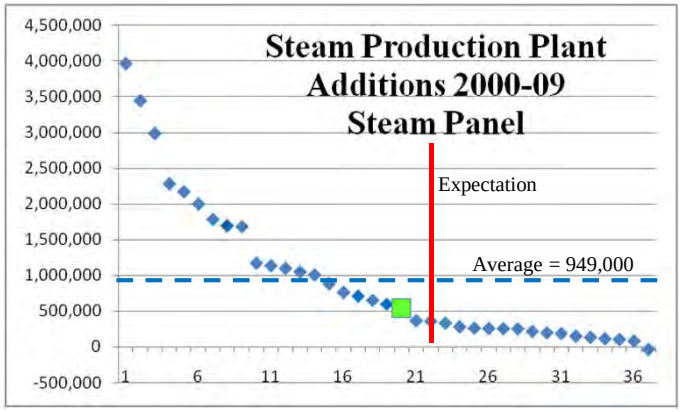


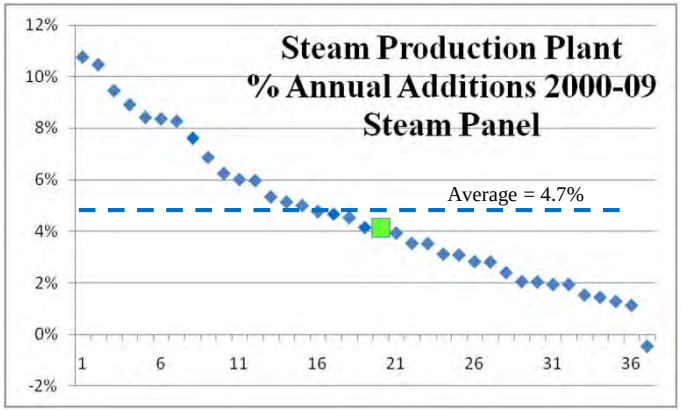


- We would expect APS to be 22nd on the left curve – they are 19th – since the curve is very flat in this section, we can conclude that APS is about where it would be expected to be
- The right curve is normalized for MWh, so the average expectation would be middle of the pack – and that is just about where APS falls

Capital

Additions to Steam Production Plant 2000-09





- APS additions to steam production plant have been slightly above benchmarking expectations, but not by a significant amount
- Average annual growth in steam plant investment since 2000 has been less than the panel average (4.0% versus 4.7%)
- The majority of APS's new investment has been in the last few years
- The lumpy nature of additions (for example, a whole new power plant) explains the wide variations in the above charts and makes comparisons problematic if outside the flat party of the curve
- In summary, there is nothing out of the ordinary in APS's spending levels

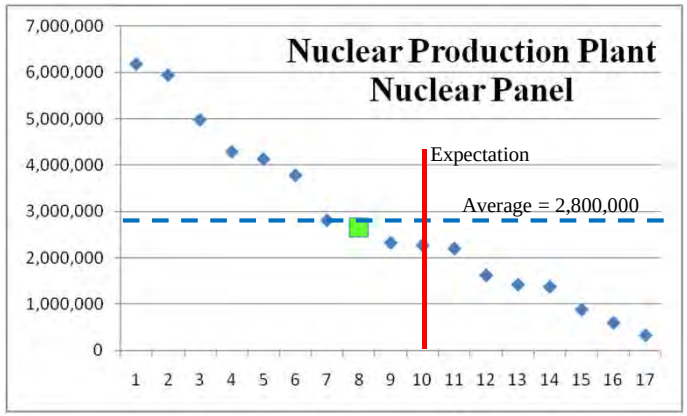
	Steam Production
EOY 2000	1,233
2001	22
2002	41
2003	42
2004	38
2005	41
2006	31
2007	62
2008	77
2009	186
9 year total	539
	44%
EOY 2009	1,772

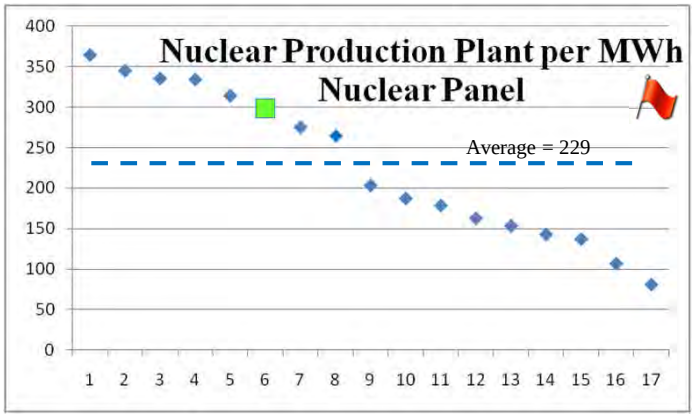
Capital

Nuclear Production Plant

Capital

Nuclear Production Plant

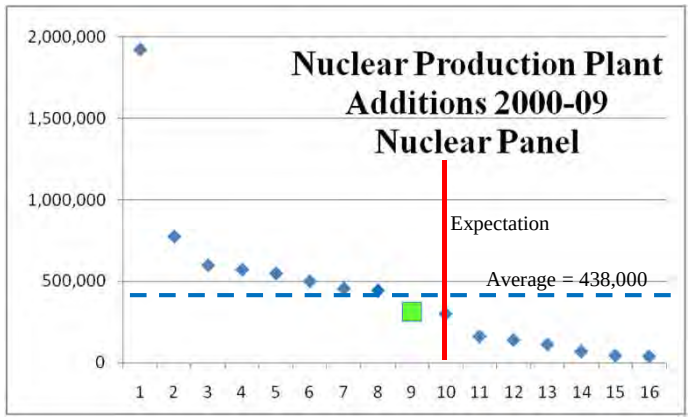


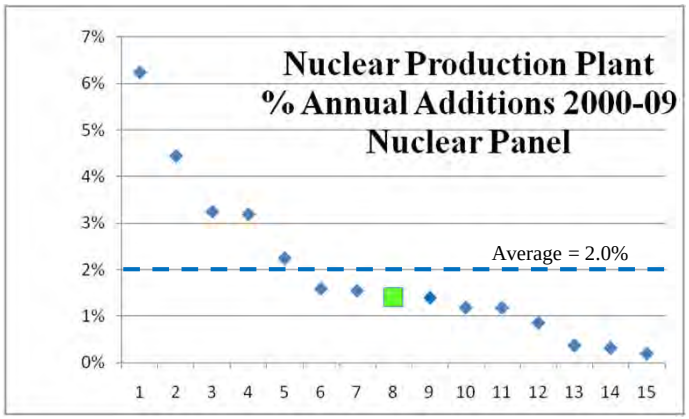


- We would expect APS to be 10th on the left curve – they are 8th – although this is not a major deviation, it nonetheless raises a flag
- The right curve, normalized for MWh, is more appropriate with APS well above the mid-point (capacity factor distorts this comparison somewhat but not significantly - a comparison to MW would have been preferred but was not available on this basis)
- Looking back, it appears that APS has invested proportionately more in nuclear on a per unit basis than average nuclear firms

Capital

Additions to Nuclear Production Plant 2000-09



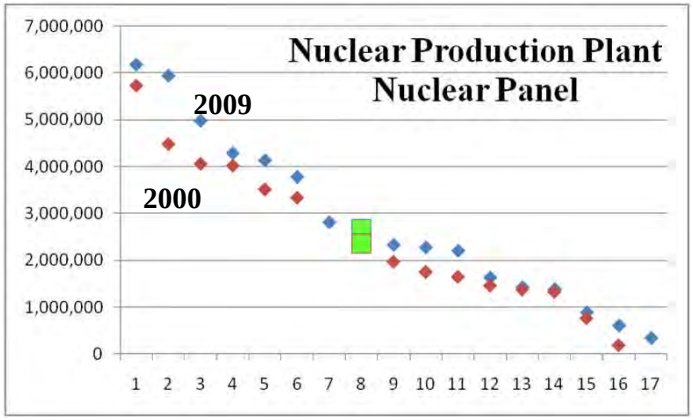


- While "old" investment in nuclear is above average, recent additions are less than the industry
- Average annual growth in nuclear plant investment since 2000 has been middle of the pack in terms of ranking but less than the panel average (1.4% versus 2.0%)
- Although there have been some major projects (such as steam generator replacements) in recent years, it does not appear that nuclear additions have been substantial in comparison to others – 50% of the total 9 year investment was made in one year - 2003

	Nuclear Production
EOY 2000	2,346
2001	-3
2002	9
2003	161
2004	-18
2005	59
2006	2
2007	5
2008	45
2009	51
9 year total	312
	13%
EOY 2009	2,658

Capital

2000 – 2009 Comparison



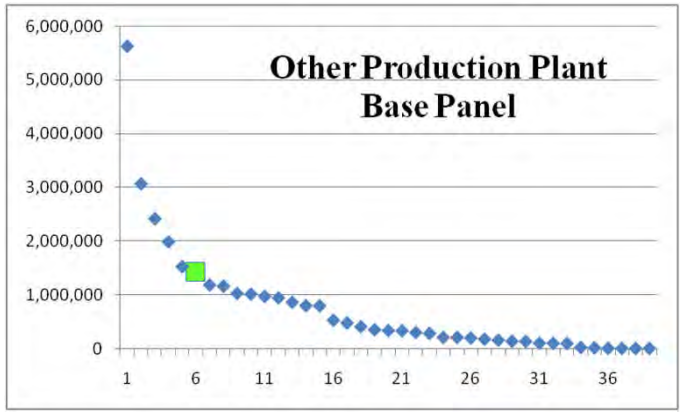
- The prior charts showed less than average growth, but a potentially high indicator on the 2009 value – this suggests that a look at prior years may be appropriate
- This chart shows that APS was 8th in 2000 and remains 8th in 2009 – as indicated on the prior page
- This suggests that despite a lower than average rate of added investment, not much has changed in terms of nuclear plant account versus other panel members

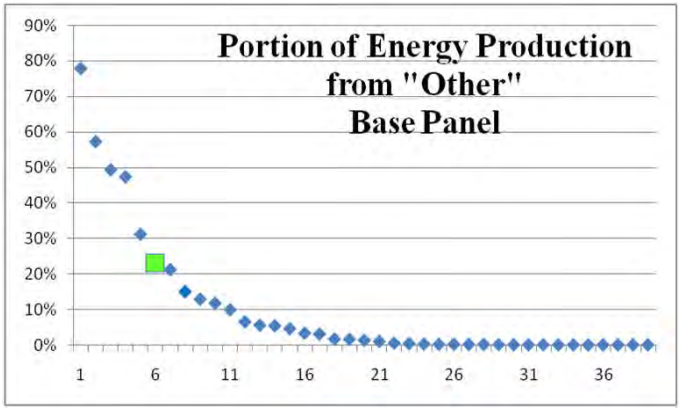
- In summary, there is conflicting data in that total nuclear investment is above panel average while growth is below
- In either case, however, there is nothing to suggest that APS's position should raise any serious questions

Other Production Plant

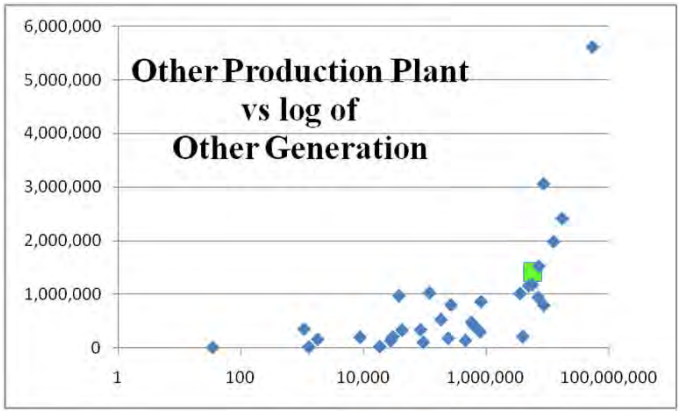
Capital

Other Production Plant



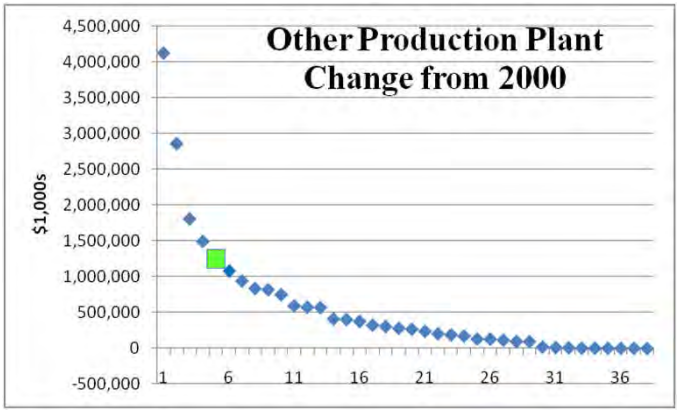


- As we observed in the O&M panel, comparisons in this category of generation are problematic because of the mix of fuels and capacity factors.
- Note the wide variance in the use of "other" by panel member (top right), ranging from 0 to nearly 80%
- While there is a clear correlation between investment and generation, it is meaningless given the wide variance in generation, caused largely by inclusion of peakers and combined cycle plants



Capital

Additions to Other Production Plant 2000-09



Other Production Plant
% Annual Change from 2000

The base panel grew at more than 16% per year in this category; however, since many panel members started at zero, an analysis of annual increases per company is inappropriate.

- As might be expected, this is the highest growth area in generation in the last decade because of combined cycle plants
- APS's growth has come about primarily from the transfer of gas-fired assets from a sister company in 2005
- Because of the very different characteristics, it is not possible to benchmark investment in "other" in a productive way
- Notwithstanding that reality, there is nothing in the APS data that suggests concern

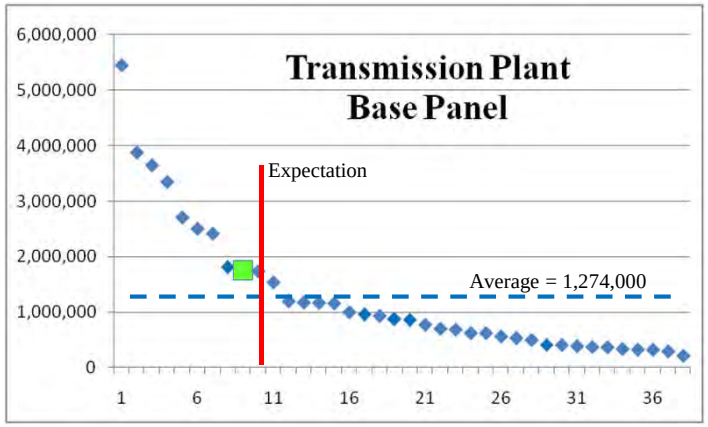
	Other Production
EOY 2000	171
2001	17
2002	14
2003	1
2004	2
2005	1,089
2006	18
2007	10
2008	77
2009	22
9 year total	1,251
	730%
EOY 2009	1,423

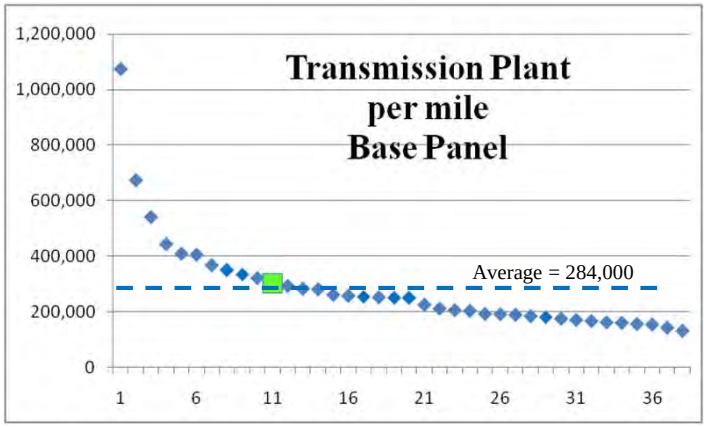
Capital

Transmission Plant

Capital

Transmission Plant

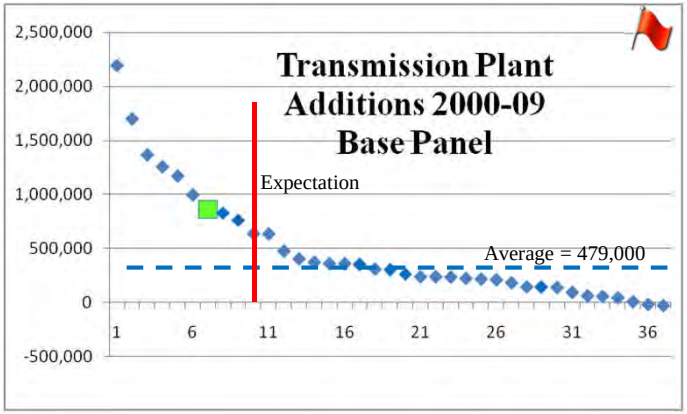


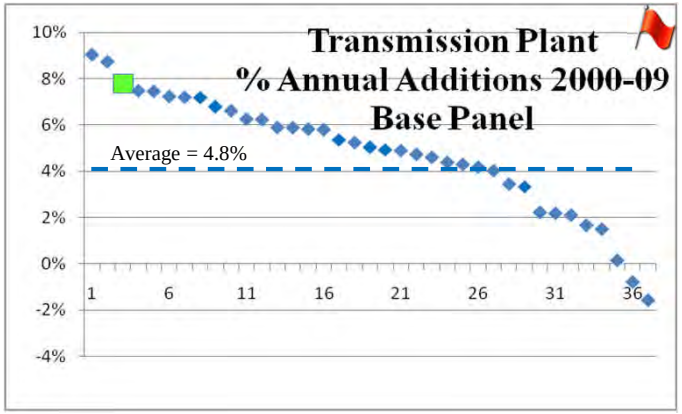


- We would expect APS to be 10th on the left curve – they are 9th – but 8-10 is essentially the same value
- The right curve is normalized for miles, so the average expectation would be middle of the pack – APS ranks high but is actually only slightly above the panel average

Capital

Additions to Transmission Plant 2000-09





- APS additions to transmission plant have been well above benchmarking expectations and well above the panel average
- This is particularly clear via APS's 3rd highest growth rate[1] – 7.8% annually since 2000, compared to only 4.8% for the panel
- This high growth rate has been consistent since 2000 and has resulted in a doubling of plant account over that period

[1] Behind Nevada Power and PSNH

	Transmission
EOY 2000	892
2001	82
2002	71
2003	111
2004	52
2005	119
2006	81
2007	110
2008	88
2009	147
9 year total	861
	97%
EOY 2009	1,753

Capital

Additions to Transmission Plant

- Robust investment in new transmission facilities is not a surprise
  - US utilities have lagged in transmission investments until perhaps the last 5 years
  - The federal government has offered significant incentives towards greater transmission investment
  - There are numerous bottle necks in the southwest and far west that constrain energy markets
  - An aggressive APS program is consistent with these realities
- But most of these factors apply to many utilities – why is APS investing at such a higher rate than others?

Recommendation 8.1: If it has not already done so, APS should submit to the ACC the rationale for its aggressive transmission investments as well as an analysis of the impact on APS and regional consumers.

Capital

Distribution Plant

Capital

Analytical Considerations

- The RFP requires analysis of distribution additions as a function of new customers
- But the annual growth in distribution investments is not solely, and perhaps not even primarily, a function of customer or sales growth
  - Investments are badly needed to modernize aging infrastructure
  - Many utilities treated distribution as the step-child for many years, and now are over-spending to “catch up” from years of under-investment
  - New technologies are taking off (Smart Grid), requiring massive new investments
- The parameter specified by the Settlement, “Distribution Additions to Plant per New Customer”, may therefore not tell a true tale
- Liberty will nonetheless analyze that parameter, but will also seek to develop other indicators that address the intent of the Settlement

Capital

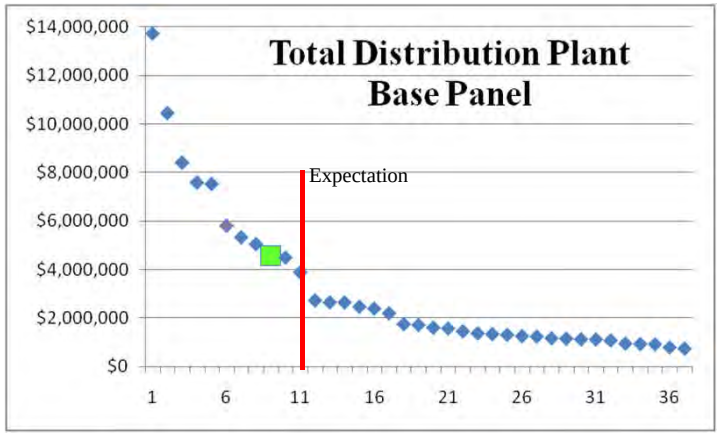
Framing the Analysis

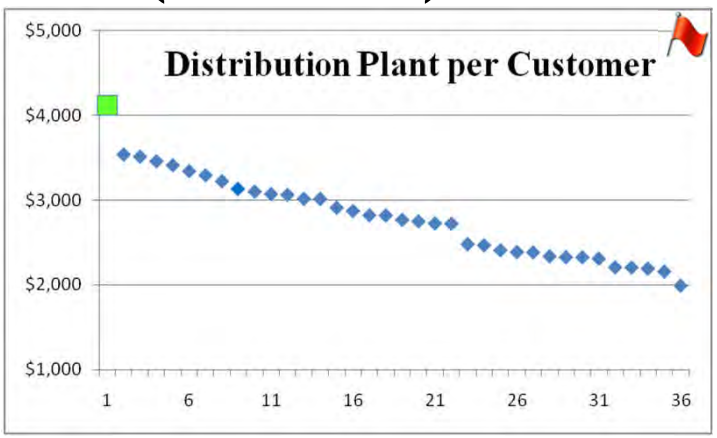
- APS is one of the fastest growing utilities in the US – as such, one would expect it to have a higher need for annual investment in distribution plant
- This leads to several questions that lend themselves to benchmarking
  - Is APS's total investment in distribution plant comparable to similar utilities?
  - Is the rate of new investment in distribution plant consistent with APS's high-growth position?
  - Is the investment required for new customers comparable to other utilities?
- The Liberty analysis will seek to answer these questions

- Terms
  - Total distribution plant is a key parameter – it is the investment in distribution prior to any deductions for accumulated depreciation
  - "New customers" is actually the net of new and departing customers
  - All data is from SNL and covers 2000-09

Capital

Total Distribution Plant (EOY 2009)



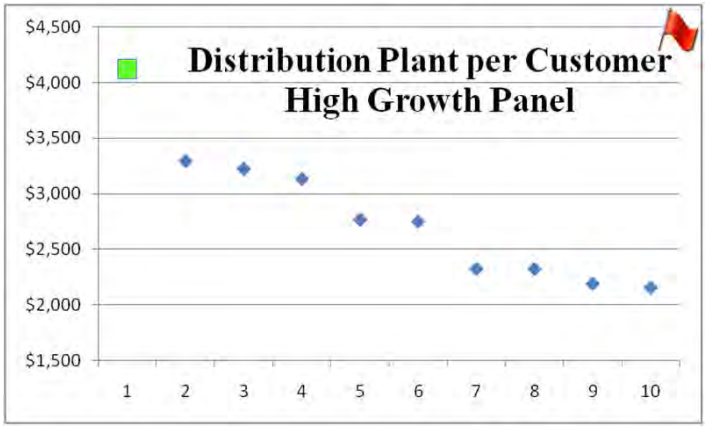


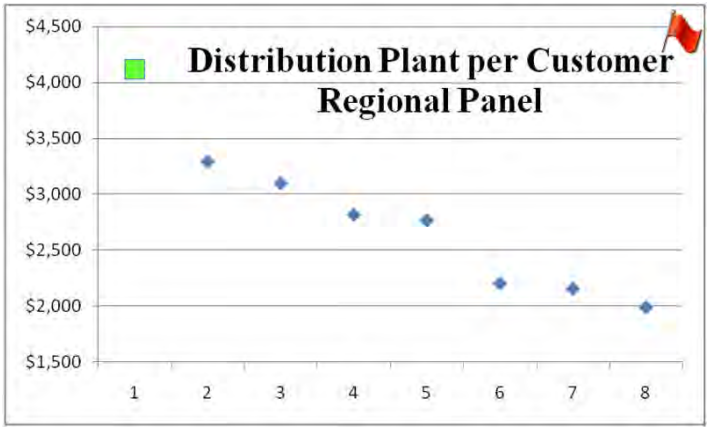
- APS ranks **9th** in distribution plant (left chart), slightly higher than our expected range – this is somewhat more significant given the large gap between 11 and 12
- But when we normalize for customer count (right chart), APS has the highest value of plant per customer in the panel – by far
- While the ranking in total plant suggests that APS has above-average investment, the degree of that overage on a per customer basis is surprising – APS is:
  - 16% over the next highest utility (Duke – Carolinas)
  - Nearly 50% higher than the average of the remaining panel members

	Distribution
EOY 2000	2,645
2001	193
2002	173
2003	175
2004	196
2005	235
2006	279
2007	287
2008	245
2009	141
9 year total	1,924
	73%
EOY 2009	4,569

Capital

Distribution Plant vs Other Panels

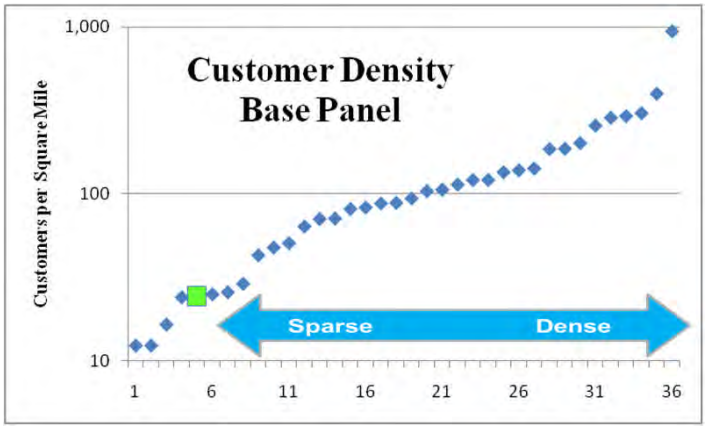


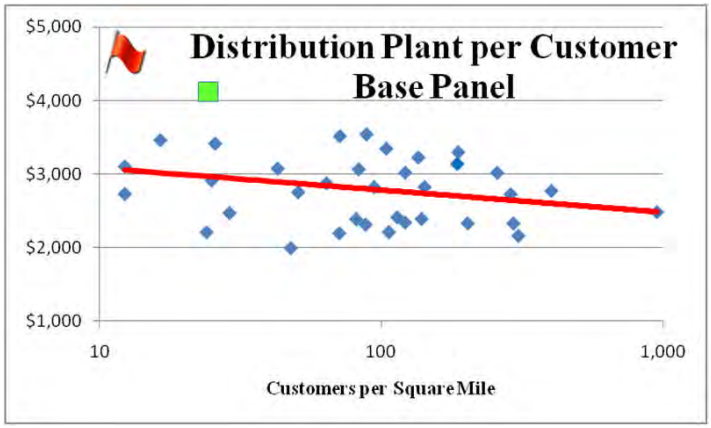


- Comparison with more finely tuned panels only worsens the APS position
- APS is 25% over the next highest utility (Nevada Power)
- It is clear that neither APS's high growth status nor its geographic location explains its top of the panel ranking

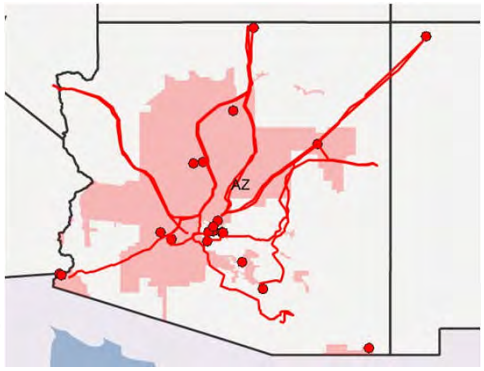
Capital

APS – Urban, Rural or Frontier?



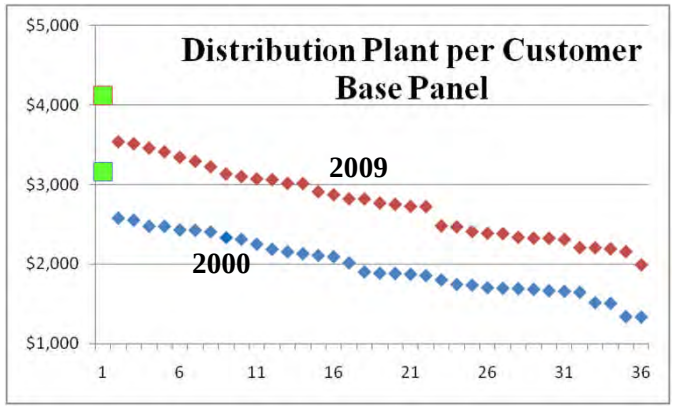


- From a density perspective, APS would be a rural, or more properly, frontier system
- But APS does have numerous population centers that contain large numbers of customers
- It would be misleading to make too much of APS's low customer density; nevertheless, density should be evaluated
- As expected, the cost data (right chart) suggests rural utilities have higher per customer costs – but this does not explain the magnitude of the APS investment, which is still an outlier



Capital

A Legacy Circumstance

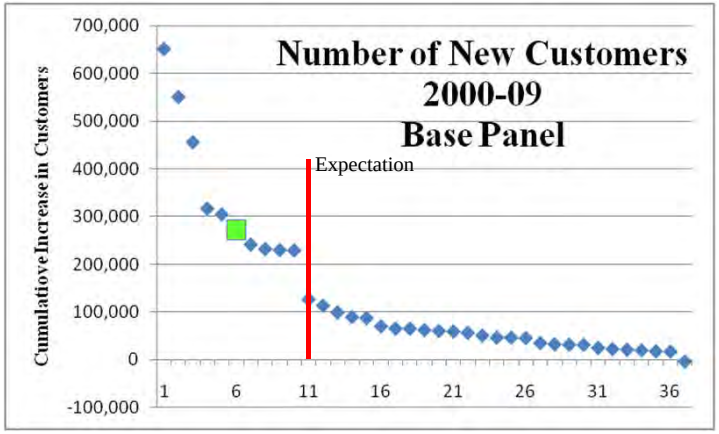


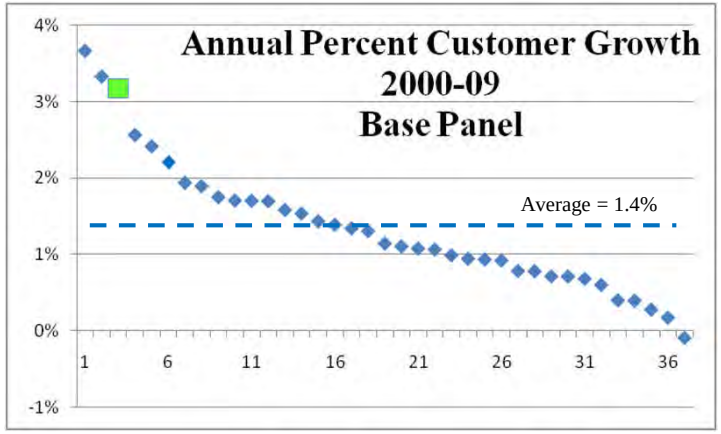
Distribution Plant per Customer		
	2000	**2009**
APS % above 2nd highest	38%	16%
APS % above remaining member average	61%	49%

- Whatever factors are driving APS to the top in distribution plant seem to have existed to a similar degree for quite some time
- The shape and relative magnitude of the data points is very similar
- In terms of growth in distribution plant, APS has actually lagged the panel, thereby narrowing the gap
  - APS: 3.0% per year growth in distribution plant
  - Base panel: 3.9% per year growth in distribution plant

Capital

Analysis of Relative Growth

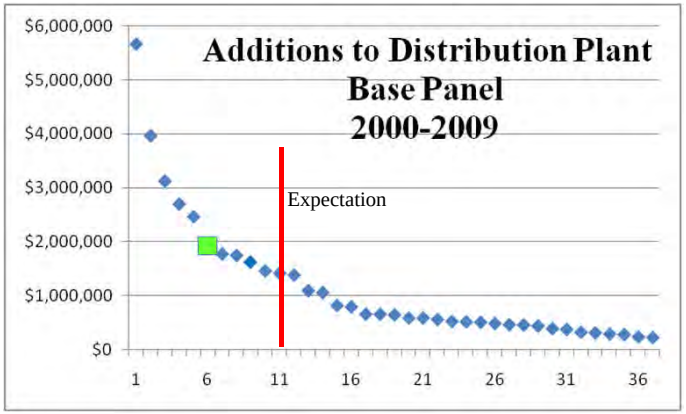


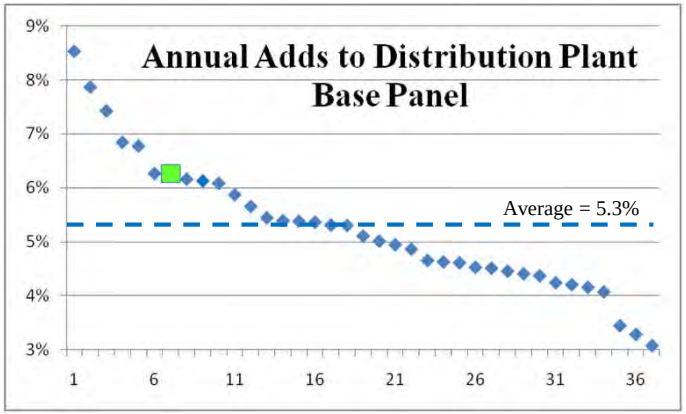


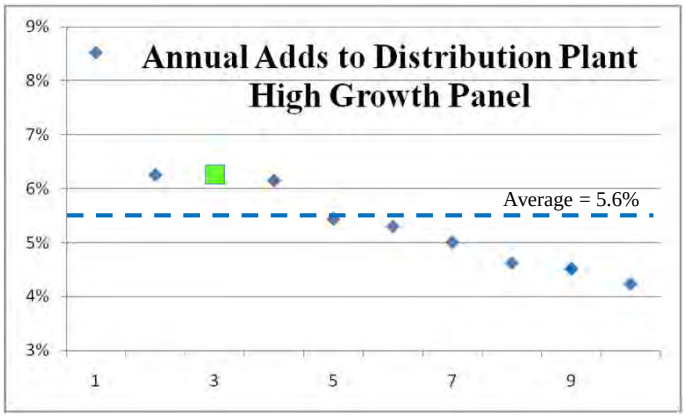
- APS ranks **6th** in terms of customer growth since 2000, compared to **11th** in number of customers – this simply confirms the obvious, that APS is a much higher growth company than the typical panel member
- And APS ranks **3rd** in terms of percentage customer growth, adding new customers far faster than most of the panel members
- This data sets the stage for comparing APS's annual investment needs for distribution – clearly such needs should be above the typical base panel member

Capital

Additions to Distribution Plant







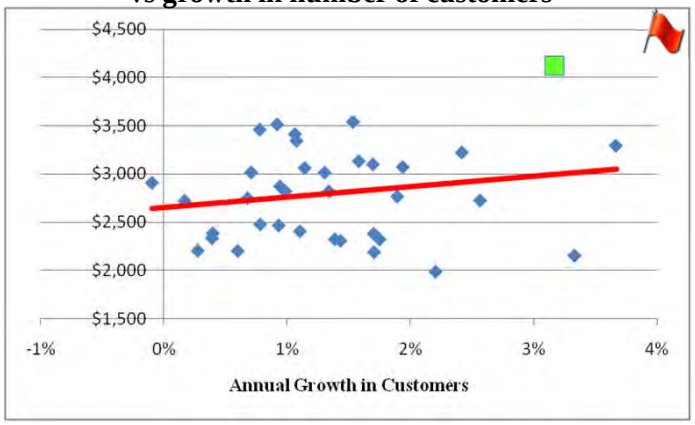
- In comparison to the base panel, additions are higher than expectation, as expected from the prior slide
- Comparison to the growth panel still shows APS to be above average
- None of these results are out of sorts with APS's role of one of the fastest growing utilities in the US

Capital

Impact of Growth

Distribution Plant per Customer
vs growth in kwh sales

Distribution Plant per Customer
vs growth in number of customers



- The charts compare plant per customer to growth in sales (left) and growth in number of customers (right)
- The customer growth relation is probably more appropriate because the sales data is distorted by negative growth in 2008-09
- Although APS is one of the highest growth firms, this does not explain the wide differential in plant per sales or per customer

Capital

Sales and Customers

- The fact that APS appears better on a per customer basis than on a per sales basis suggests that APS has below-average sales per customer
- This is indeed the case, although not to the extreme

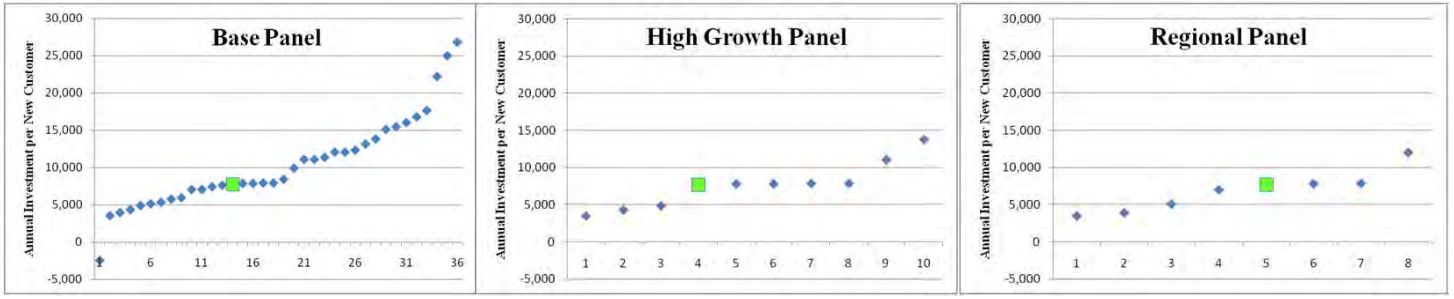
	MWh Sales per Customer	APS Rank
APS	25.4	
Base Panel	28.1	28 of 37
Nuclear Panel	26.7	10 of 16
Regional Panel	25.6	4 of 8

- At the same time, APS's annual growth in sales has lagged slightly behind the growth in customers, suggesting a downward trend in sales / customer
- This may be linked to APS's observation that they have a customer base that is more transient
- Prior to 2008, sales and customer growth were essentially the same

Capital

Investment in Distribution Plant per New Customer

Average 2000-09



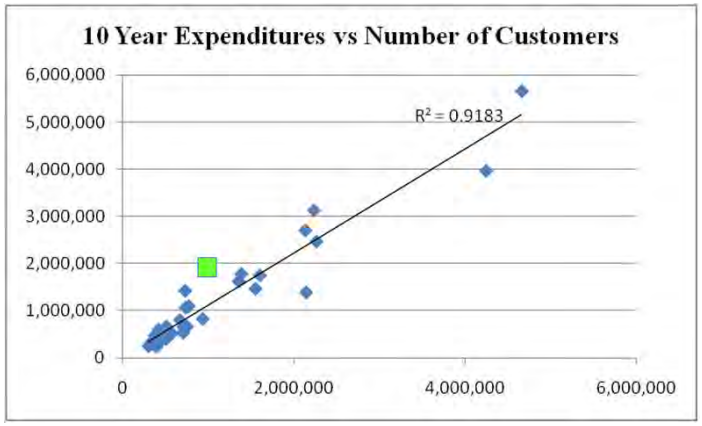
- Changes in plant account are "lumpy" and in some cases unrepresentative (for example, due to acquisitions) – as a result, an average that excludes the maximum and minimum years for each utility was used

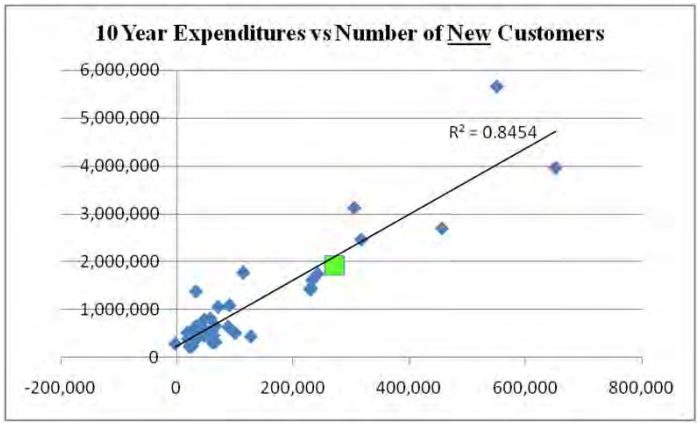
	Median	APS Rank
APS	7,699	
Base Panel	8,397	14 of 37
Hi Growth Panel	7,834	4 of 10
Regional Panel	7,363	5 of 8

- As emphasized earlier, investment in plant is stimulated by far more than new customers – the investment per new customer parameter must therefore be used with care
- The APS placing in the panels is unremarkable – Q2 for base and high growth and Q3 for regional
- APS is within 10% of the median value of each panel (see table), despite the bandwidth of the largest panel being 300% of APS – this is a strong indicator that APS is not unusual

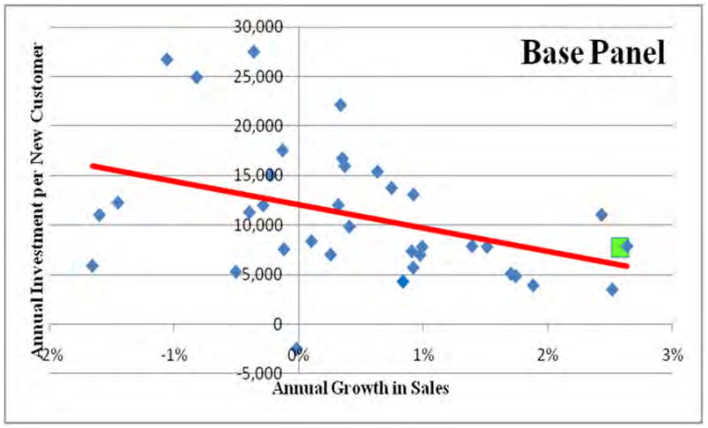
Capital

Investment in Distribution is <u>not</u> a function of New Customers



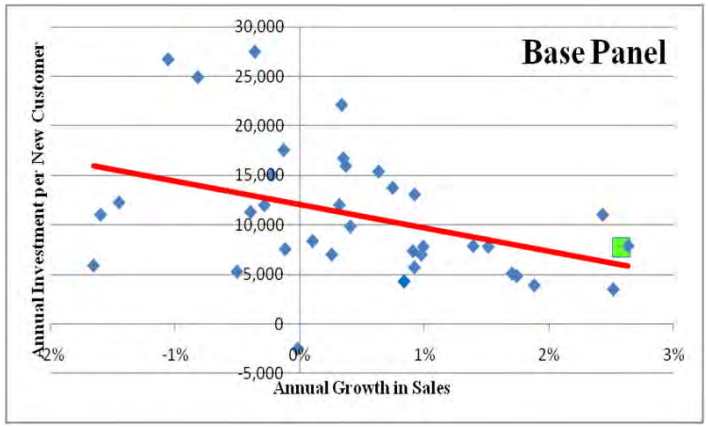


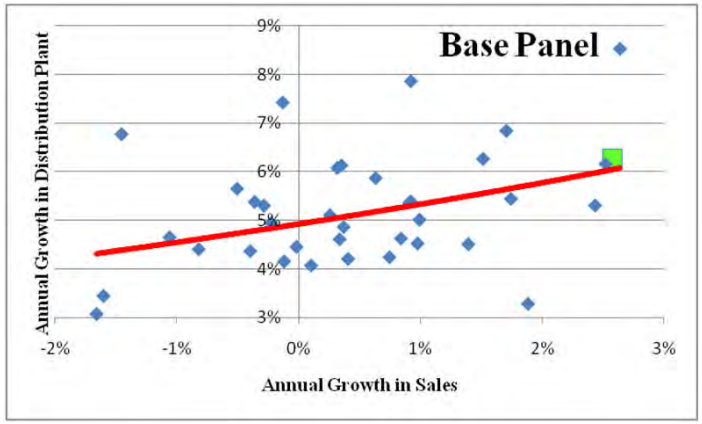
- The top left chart (customers) is a better fit than the top right (new customers)
- APS moves from above the line (higher unit costs) on a customer basis to below the line on a new customer basis, suggesting an artificial deflation by dividing by the larger number
- The bottom right chart has a downward slope – why? Again because we are artificially lowering the unit costs of the high growth companies by dividing by new customers



The Role of Growth

Investment in Distribution Plant per New Customer versus Annual Growth Rate in Sales



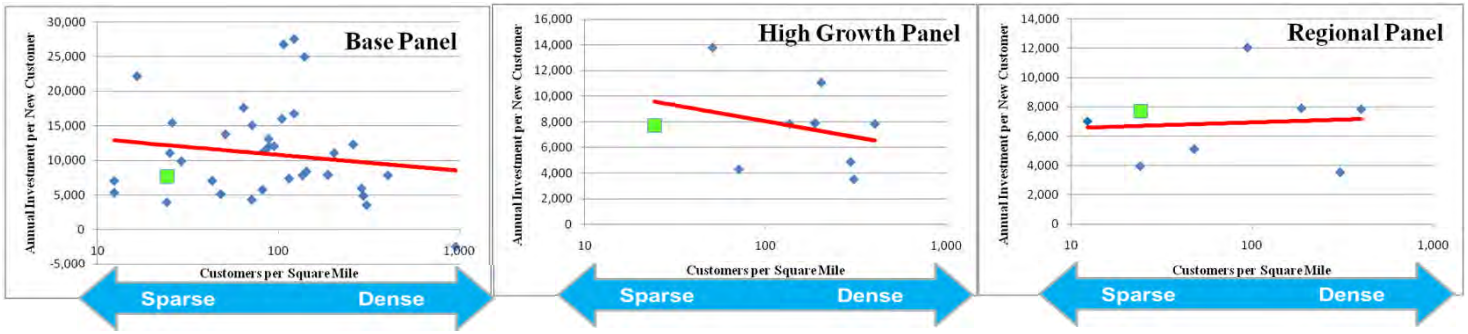


- The high growth firms enjoy lower costs per new customer (the left chart)
  - Growth in plant comes from more than just new customers
  - A larger number of new customers raises costs, but also provides a larger base to spread the non-customer related costs over
- On the other hand, the high growth firms, as should be expected, see a greater percentage increase in plant (the right chart)
- APS appears on both charts almost precisely where one would expect

Capital

Impact of Customer Density

Annual investment in distribution per new customer vs. customer density



- When the nature of the service territory is considered, APS's comparative position in the base panel improves.
  - This is most likely due to the "new customers in the denominator" effect discussed on the prior page.
  - The effect is less pronounced in the other two panels since most of those members share the high growth characteristic
- In summary, a rural service territory tends to increase the cost of a new customer, but this does not seem to adversely impact APS

Capital

Summary of Observations – Distribution

- APS is one of the fastest growing utilities in the US – as such, one would expect it to have a higher need for annual investment in distribution plant
- APS's total investment in distribution is above what one might expect based on the benchmarking data
  - Rank for total investment is out of proportion to utility size
  - Normalized value (per customer) is above every other panel member – *to the extreme*
  - None of the typical differentiators (growth rate, region, customer density) explain this disparity
  - The large gap with the industry is long-standing
    - The gap has narrowed in recent years but remains extraordinary
    - Distribution plant is growing at a 3.0% rate versus 3.9% for the panel
  - After several discussions with APS, we were unable to identify the cause of this phenomenon.
- APS's growth in plant on an annual basis is about what one should expect, whether measured on an absolute basis or on a new customer basis

APS Benchmarking Analysis

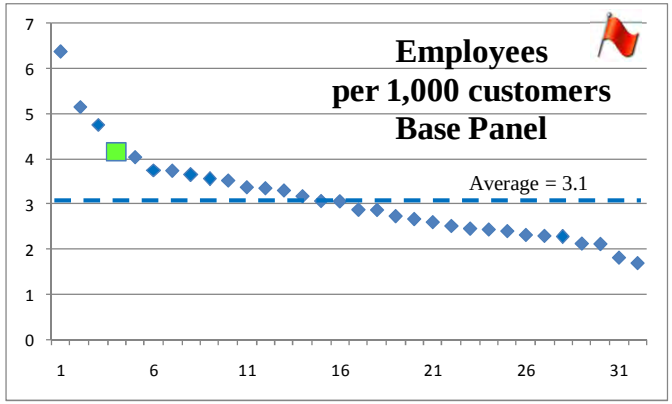
Exhibit IX

Mgt., Labor and Reg. Expense

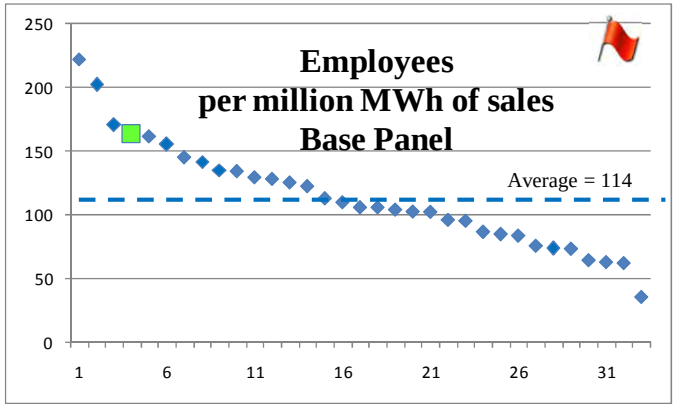
Topics

- **In this section we will examine:**
  - **Staffing**
    - Number of employees
    - Salaries and wages
    - Pensions and benefits
  - **Regulatory Commission expenses**

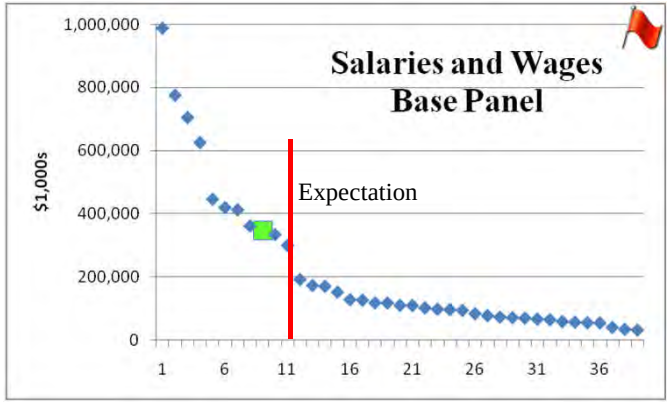
Employees

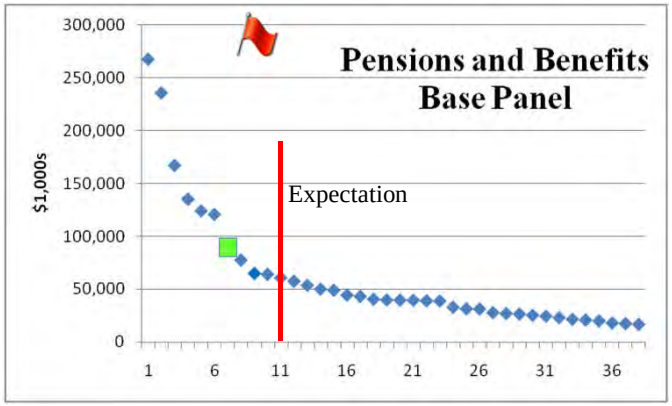


- Because of joint ownerships at Palo Verde and other participant plants, the equivalent APS count is approximately 4,600 out of the total APS employee count of 6,800
- APS ranks No. 9 in terms of employees, which is slightly above its ranking as the 11th largest company on the Base Panel
- Based on per sales and per customer measures, APS is substantially above the panel for staffing



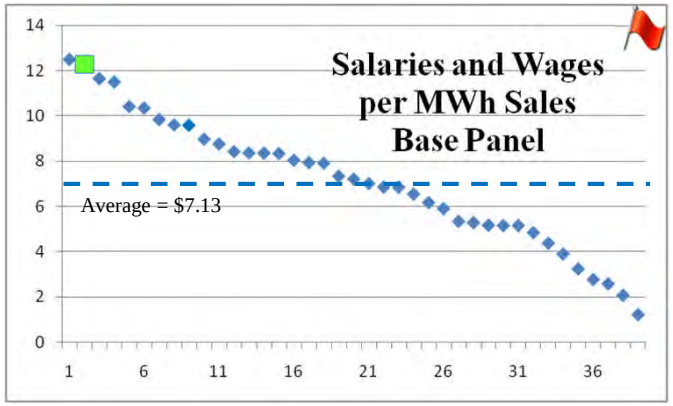
Employee Costs

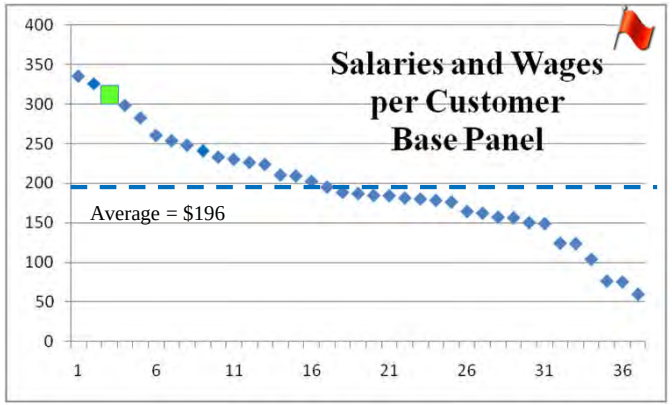




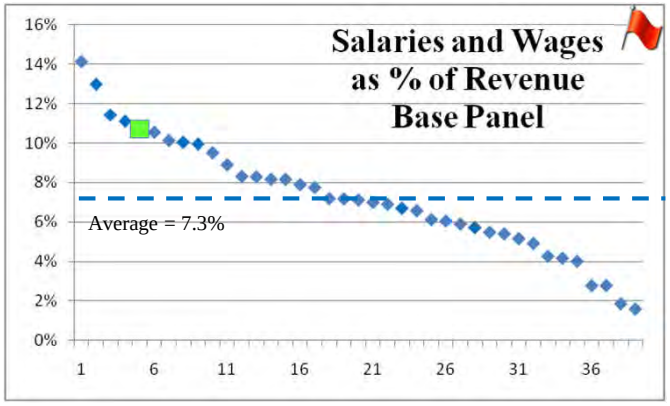
- We would expect APS to fall about 11th in this panel, but it is above this ranking in both measures:
  - Salaries and wages - 9th
  - Pensions and benefits – 7th
- This might be especially suggestive in that the 11th and below positions are in a relatively tight grouping while the left-most utilities exhibit far higher values

Salaries and Wages

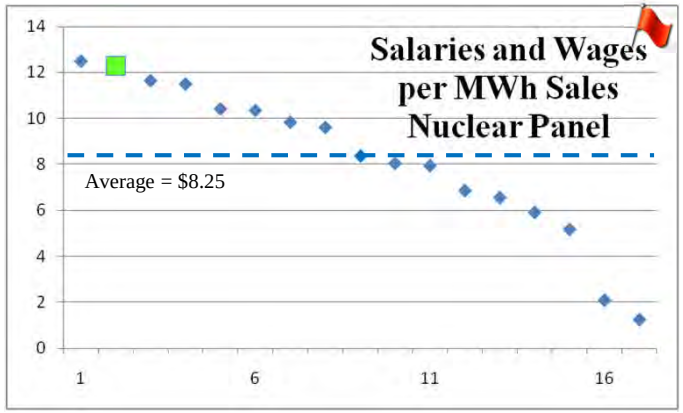


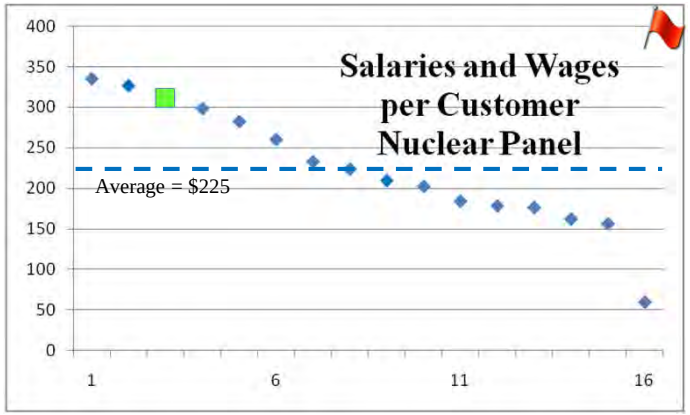


- As suggested by the prior ranking, APS salaries and wages appear high in the panel, exceeding the panel averages by wide margins
  - $12.27 per MWh versus $7.13
  - $312 per customer versus $196
  - 10.7% of revenue versus 7.3%

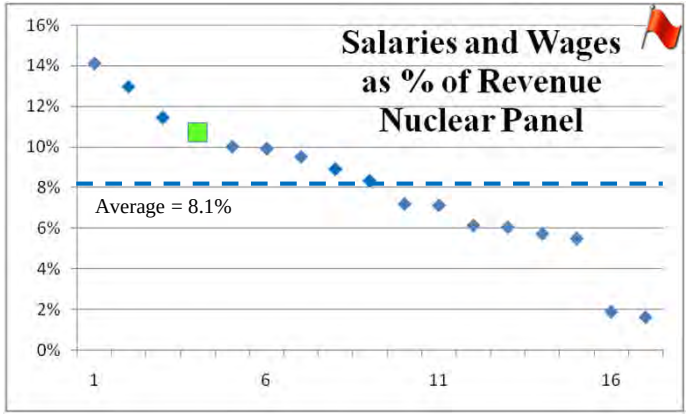


Salaries and Wages – Nuclear Panel

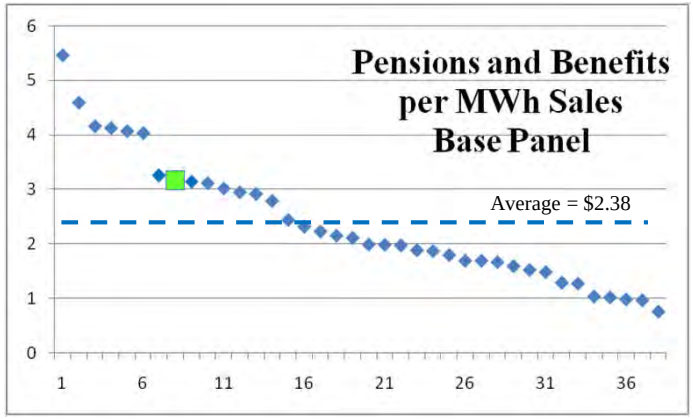


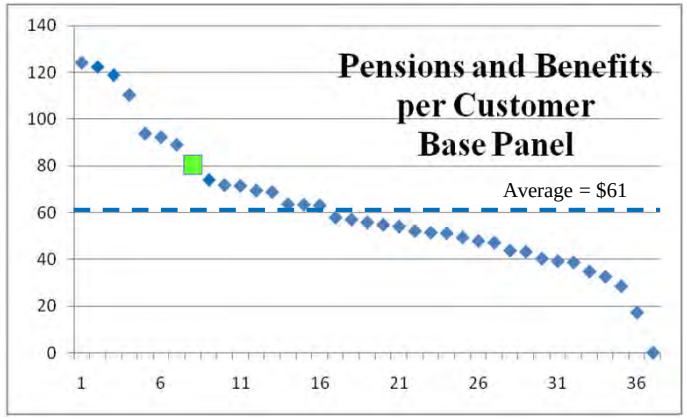


- The average salaries rise in the nuclear panel, but APS's relative position is still high in the ranking and well above average panel costs
  - $12.27 per MWh versus $8.25
  - $312 per customer versus $225
  - 10.7% of revenue versus 8.1%

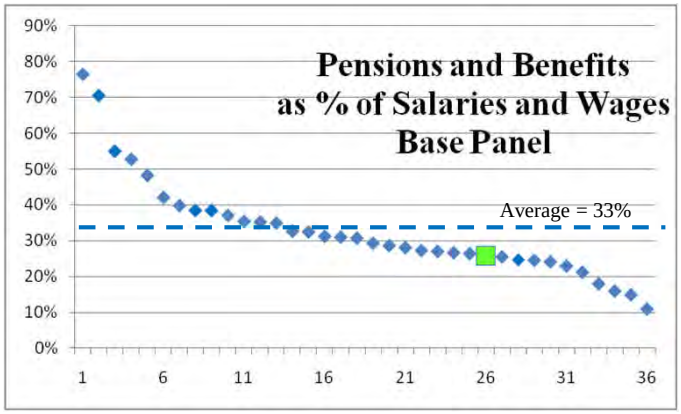


Pensions and Benefits

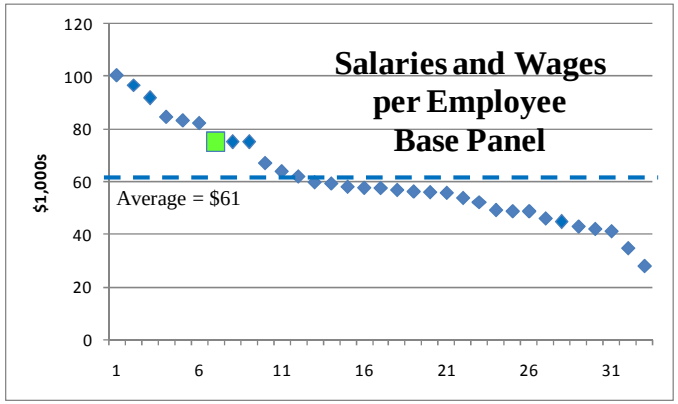


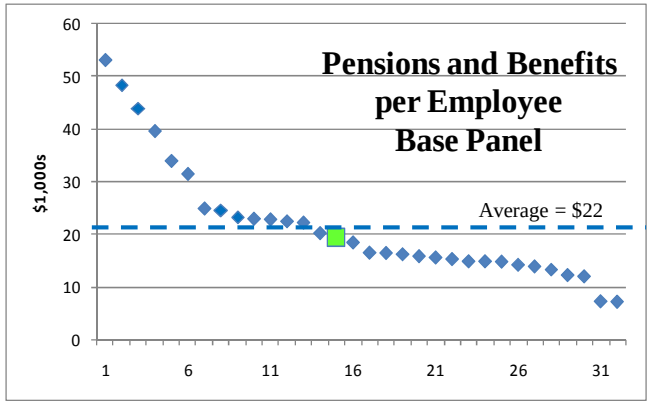


- APS's pension costs are above the panel average, but not to the same extent as salaries
- APS pension costs are below the industry average when measured as a percent of salaries
- The high ranking of pension costs appears to be a consequence of salaries, and not a potential issue in itself



Cost per Employee





- On a per employee basis, APS is above average in Salaries and Wages and slightly below average in Pensions and Benefits.

Analysis of Staffing and Associated Costs

- On the surface, the data is compelling that:
  - The number of employees at APS is significantly higher than other panel companies (even after removing 2,200 employees for the nuclear adjustment)
  - Salaries and wages are also high versus the panels, by an amount more than would be expected by the theorized staffing overage
  - Pensions and benefits appear to be average
  - The latter two points are confirmed by analysis showing cost per employee is:
    - High for S&W
    - Average for P&B

- There could be some legitimate reasons for some of these projected overages
  - APS has suggested higher than normal capital spending

- The magnitude and breadth of the theorized overages make it likely that this issue cannot be fully explained away

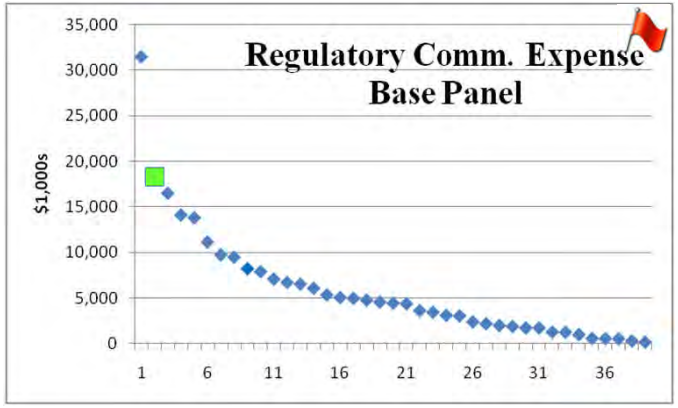
Linking Staffing to Other Benchmarks

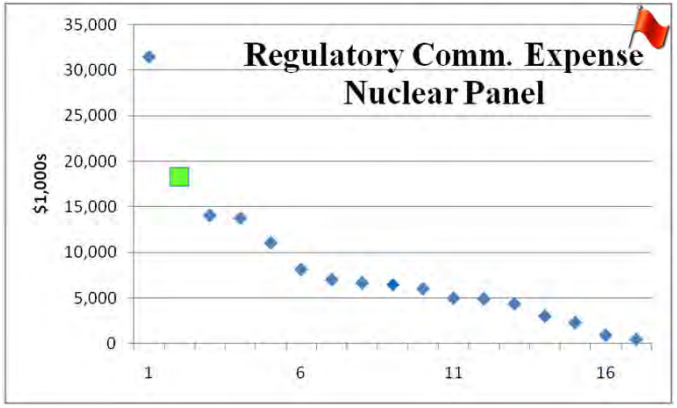
- More than any other factor we have examined, staffing is the most likely to have impacted other areas in this study that have been identified as higher than industry
- Personnel costs are a major component of O&M, so to suggest staffing is high after concluding some elements of O&M are high, is logical
- A study aimed specifically at staffing would therefore appear to lead to duplication of effort; rather, the other findings of this report can be used to identify which organizations should be the subject of any focus on staffing

Recommendation 9.1: APS should complete an overview of its staffing levels to determine the approximate overage, if any, and reconcile its deviations from industry data.

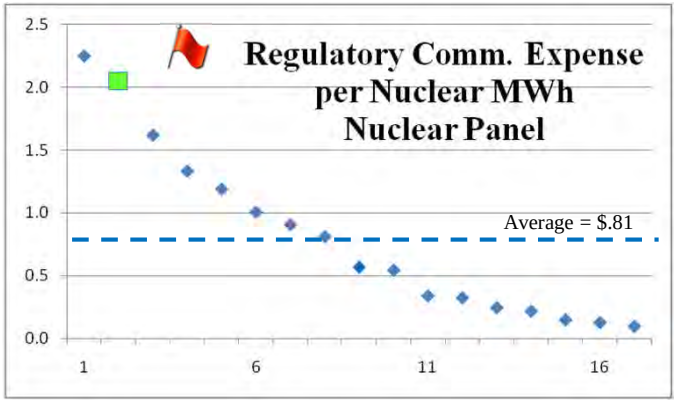
Recommendation 9.2: APS should conduct a detailed staffing analysis in those areas where it concludes costs, as discussed in this report, are out of synch with industry levels. This might include at least nuclear O&M, combined cycle O&M and customer expense.

Regulatory Commission Expenses





- APS is again very highly ranked – one can expect that nuclear-related fees are included (top left)
- It is therefore appropriate to look at the nuclear panel, but APS is again ranked near the top (top right). And several times the level of most of the panel members
- Normalizing to nuclear MWh does not improve the situation (bottom right)



Analysis of Regulatory Commission Expenses

- APS is clearly an outlier in this category, with costs higher than others
- Discussions with the company identified a few anomalies that would narrow the gap, but not significantly
- Although the costs here are small relative to many of our other categories, they do represent a potential $10 million overage, too much to ignore
- It is likely the costs here are mandatory and out of the utility's control, but again the amount forces further investigation

Recommendation 9.3: APS should audit all payments for "Regulatory Commission Expenses" and determine the reasons why this account is inconsistent with other utilities.

APS Benchmarking Analysis

Exhibit X

Finance

THE LIBERTY CONSULTING GROUP

Financial Benchmarking Parameters

- **Financial Performance**
  - *Return on Average Equity (ROAE)*
  - *Return on Average Assets (ROAA)*
  - *Earnings Growth Rates*
  - *Equity Investment Performance*

Financial Performance

1. ROAE
2. ROAA
3. EGR
4. EIP

- **Credit/Cash Flow Metrics**
  - *Adjusted Operating Cash Flow /Average Debt*
  - *Cash Flow Interest Coverage*
  - *Net Cash Flow/CAPEX*
  - *Total Debt/Capitalization Ratio*

Credit Metrics

5. CF/Debt
6. CF/Int.
7. CF/CAPEX
8. Debt/Cap.

- **Other Financial Measures**
  - *CWIP/Net PP&E*
  - *Dividend Payout Ratio to Parent*
  - *Debt and Commercial Paper Rating*

Other Fin. Measures

9. CWIP/Net PP&E
10. DPR
11. Debt & CP Ratings

Financial Performance

Financial Performance

Annual return on equity capital invested in the utility

- *1. Return on Average Equity (ROAE)*

$$\frac{\textbf{Net Income } \textit{(before ext.)}}{\textbf{Average Common Equity}}$$

ROAE

Return on the total asset investment of the utility

- *2. Return on Average Assets (ROAA)*

$$\frac{\textbf{Net Income } \textit{(before ext.)}}{\textbf{Average Assetts}}$$

ROAA

Operating Utility earnings growth rate

- *3. Earnings Growth Rates*

Compound growth rate of:

Net Income *(before ext.)*

EGR

Total return to parent company, including dividends and retained earnings growth

- *4. Equity Investment Performance*

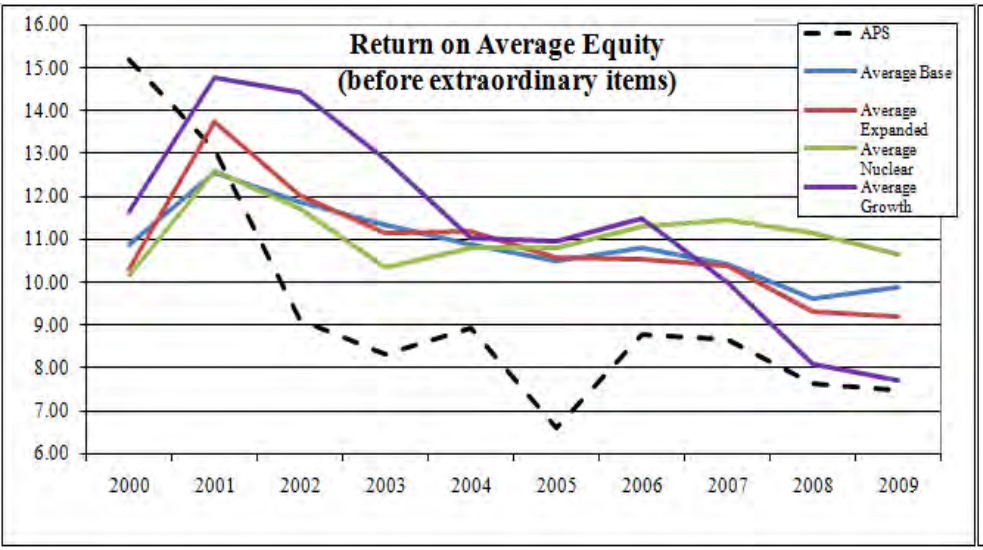
Compound growth rate of:

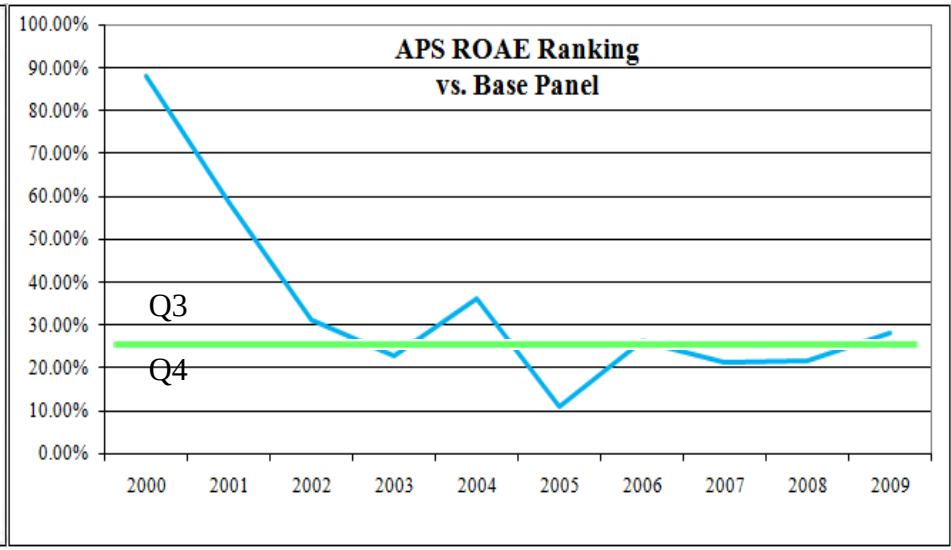
$$\frac{\textbf{Net Income } \textit{(before ext.)}}{\textbf{Average Common Equity}}$$

EIP

ROAE

1. Return on Average Equity

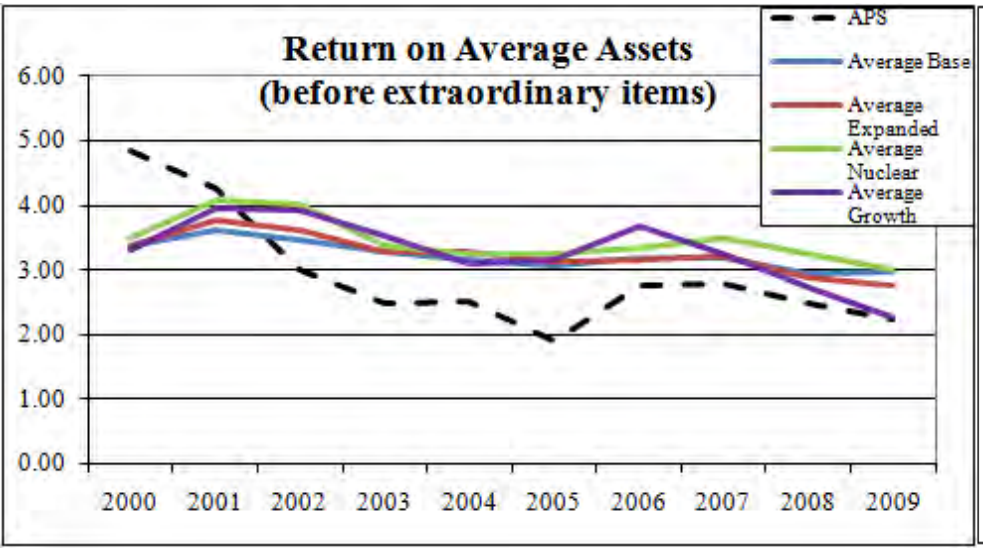


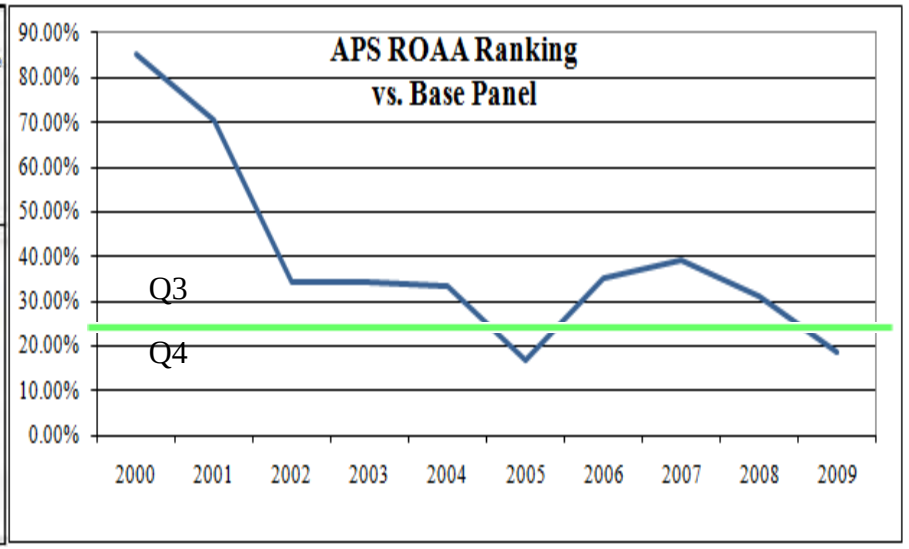


- APS's ROE was well below that of <u>all</u> panels from 2002-2009
- APS had low third or fourth-quartile performance as compared to the base panel for 2002-2009

ROAA

2. Return on Average Assets





- APS' ROA performance was also well below all of the panels from 2002-2009
- Performance since 2002 was equivalent to the third and fourth quartile of the base panel

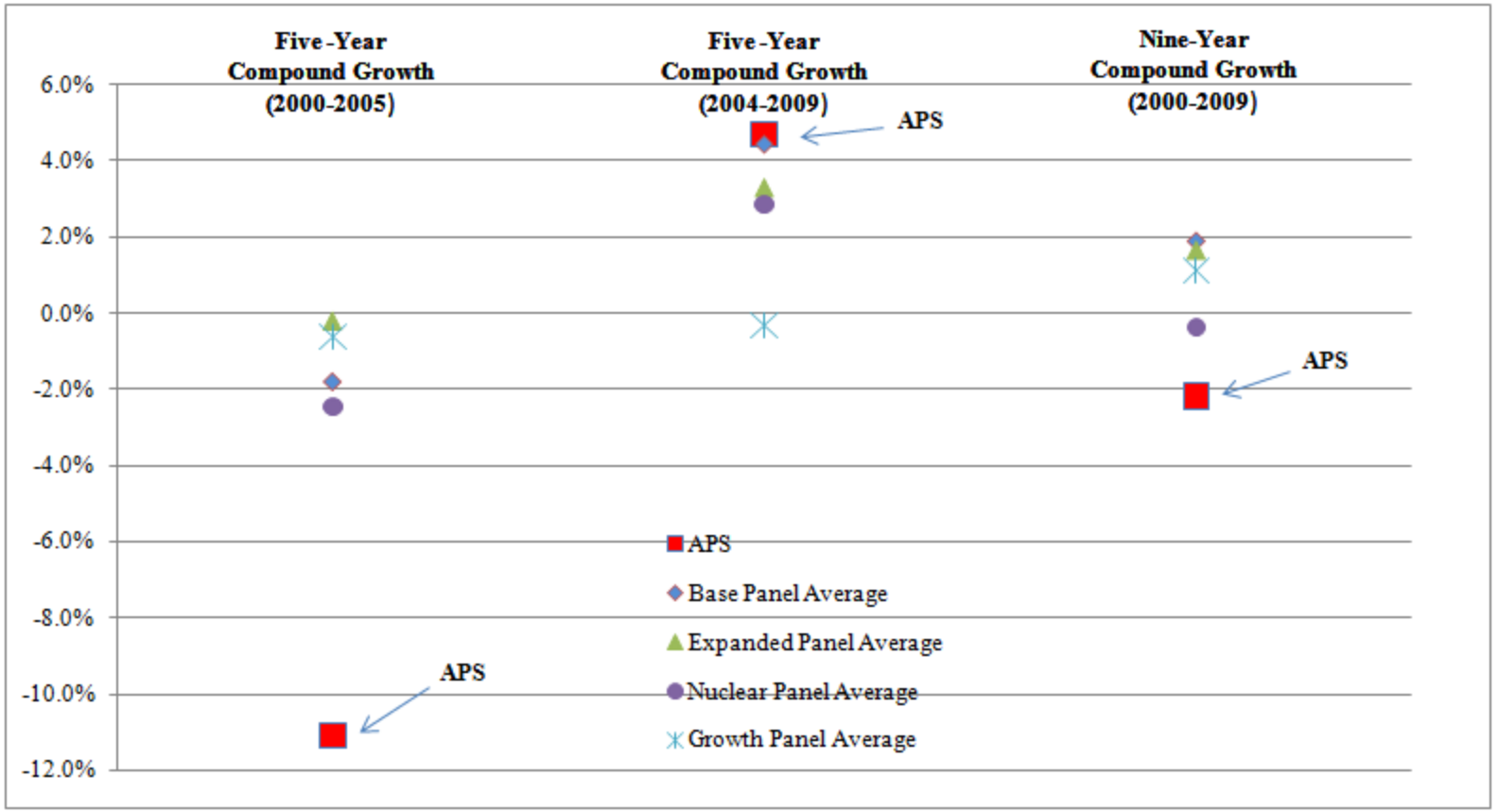
Drivers of APS Return Results

- In 2000 and 2001, APS had substantial incremental profits from marketing and trading operations
- APS had fuel-related issues 2002-2006; fuel write-off of $139 million in 2005
- High growth in APS' CAPEX and operating expenses combined with historical test periods caused consistent earnings attrition

EGR

3. Earnings Growth Rate

- *Compound growth rate of Net Income Before Extraordinary Items*



- Nine-year compound growth rate used due to large APS write-off in 1999
- APS earning growth was far below all panels, 2000-2005
- APS earnings recovery in 2004-2009 raises 9-year results nearer to panel averages

EGR

APS Earnings Growth Rate vs. Panel Averages
(cont'd)

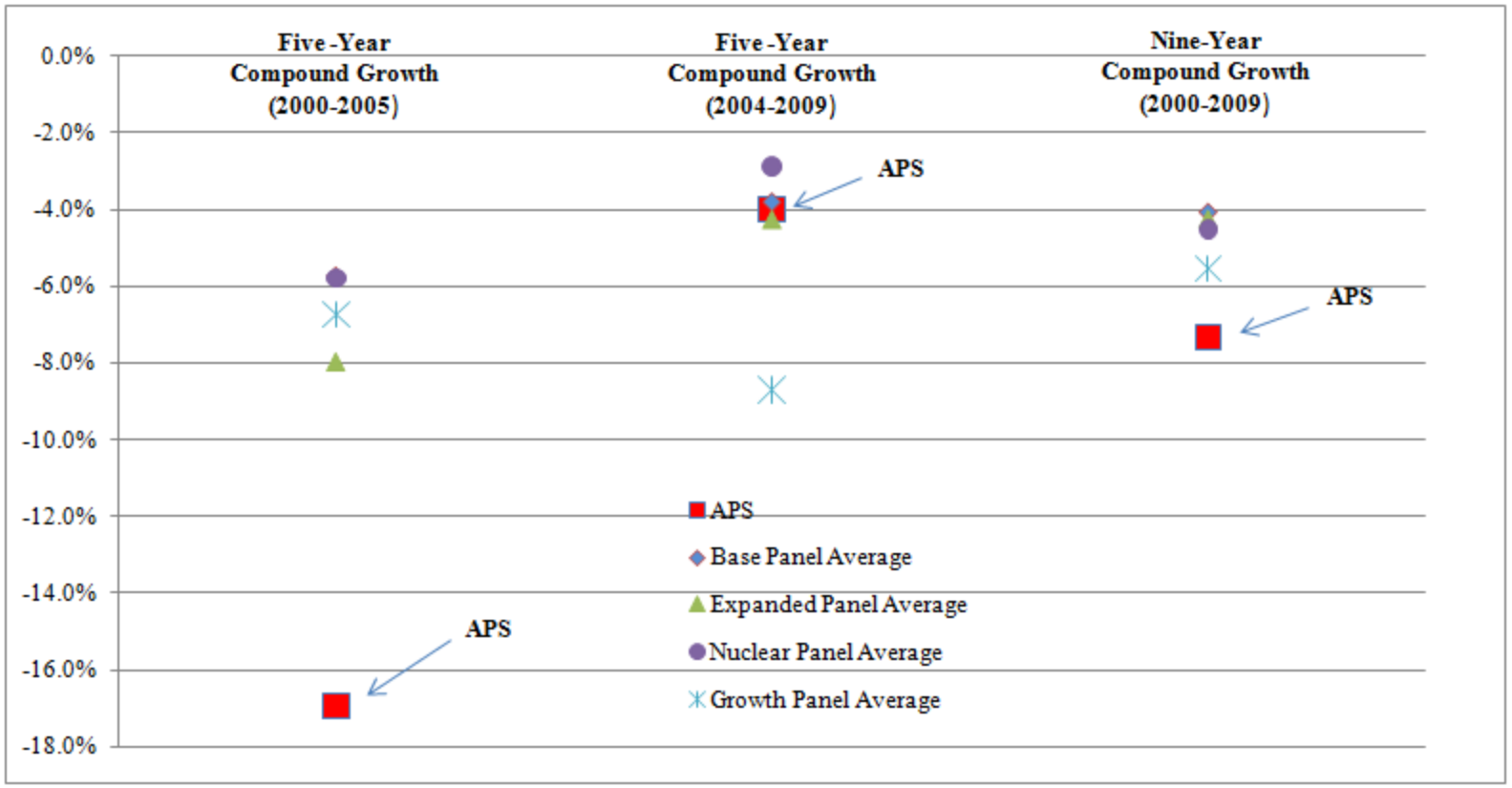
APS/Panel	Five -Year Compound Growth *(2000-2005)*	Five -Year Compound Growth *(2004-2009)*	Nine-Year Compound Growth *(2000-2009)*
APS	-11.1%	4.7%	-2.2%
Base Panel Average	-1.8%	4.5%	1.9%
Expanded Panel Average	-0.2%	3.3%	1.7%
Nuclear Panel Average	-2.4%	2.9%	-0.4%
Growth Panel Average	-0.6%	-0.3%	1.1%

- APS negative earnings growth 2000-2005 was an outlier to all panel results; the 2005 write-off was a large factor
- APS 2004-2009 growth rates are above panels, but do not bring 9-year results near panel averages

4. Equity Investment Performance

EIP

- *Compound growth rate of (APS Net Income Before Extraordinary / Common Equity)*



- Nine-year compound growth rate used due to large APS write-off in 1999
- APS earning growth was again far below all panels, 2000-2005
- APS earnings recovery in 2004-2009 again raises 9-year results nearer to panel averages

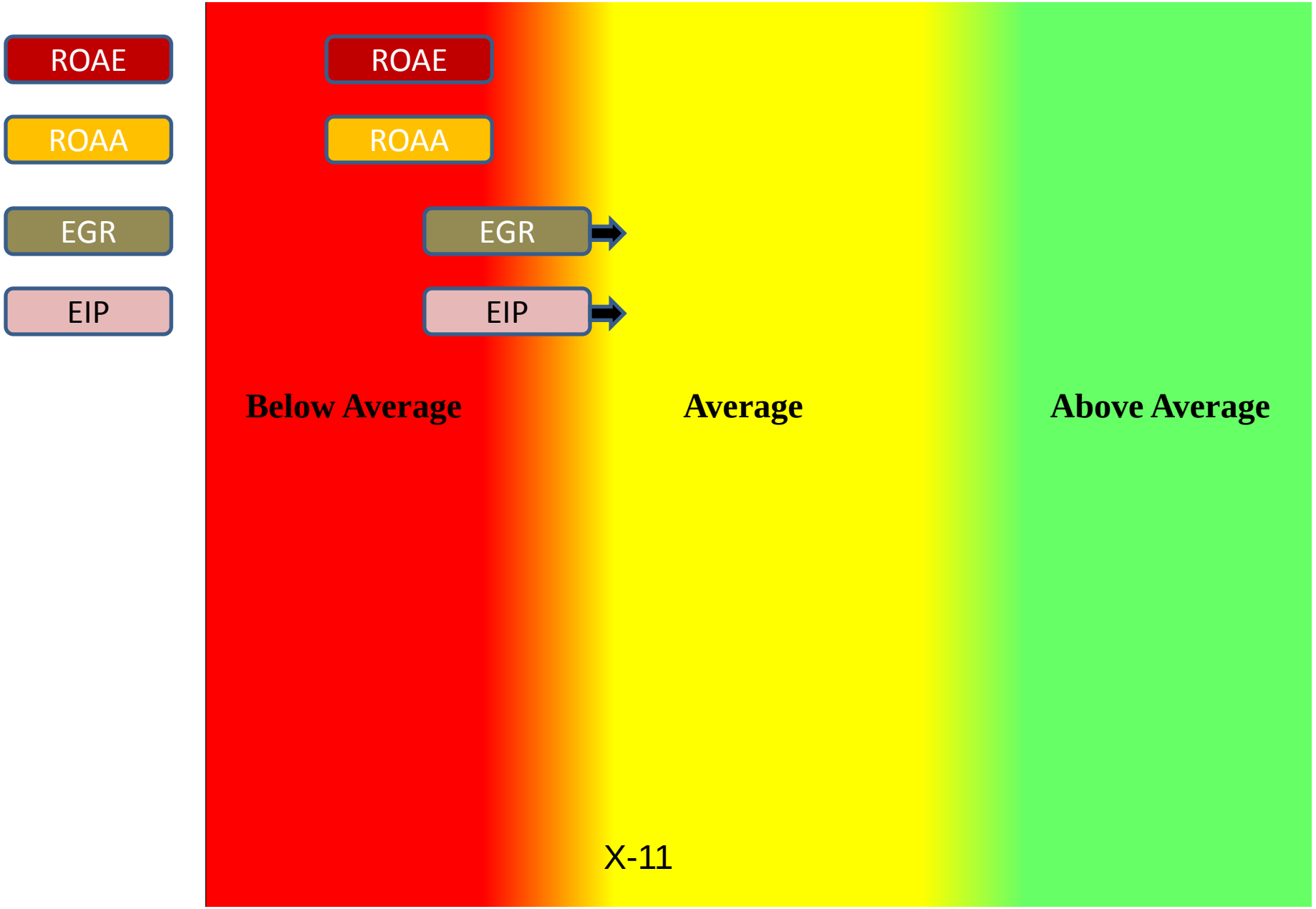
EIP

APS Equity Investment Performance vs. Panel Averages *(cont'd)*

APS/Panel	Five -Year Compound Growth *(2000-2005)*	Five -Year Compound Growth *(2004-2009)*	Nine-Year Compound Growth *(2000-2009)*
APS	-17.0%	-4.0%	-7.3%
Base Panel Average	-5.7%	-3.8%	-4.1%
Expanded Panel Average	-8.0%	-4.3%	-4.3%
Nuclear Panel Average	-5.8%	-2.9%	-4.5%
Growth Panel Average	-6.7%	-8.7%	-5.6%

- APS negative earnings growth 2000-2005 was an outlier to all panel results; the 2005 write-off was a large factor
- APS 2004-2009 growth rates are nearer panels, but do not bring 9-year results to panel averages

Financial Performance Metrics



Credit/Cash Flow Metrics

Credit Metrics

Credit measure for cash flow adequacy relative to debt

- *5. Adjusted Operating Cash Flow /Average Debt*

$$\frac{\text{Operating Cash Flow}}{\text{Average Debt}}$$

CF/Debt

Cash flow adequacy relative to interest requirements

- *6. Adj. Op. Cash Flow/Interest*

$$\frac{\text{Operating Cash Flow + Interest}}{\text{Interest}}$$

CF/Int.

Internal funding of capital expenditure program

- *7. Net Cash Flow/CAPEX*

Internal Cash % of CAPEX

CF/CAPEX

Raw Debt Leverage w/o Rating Agency Adjustments

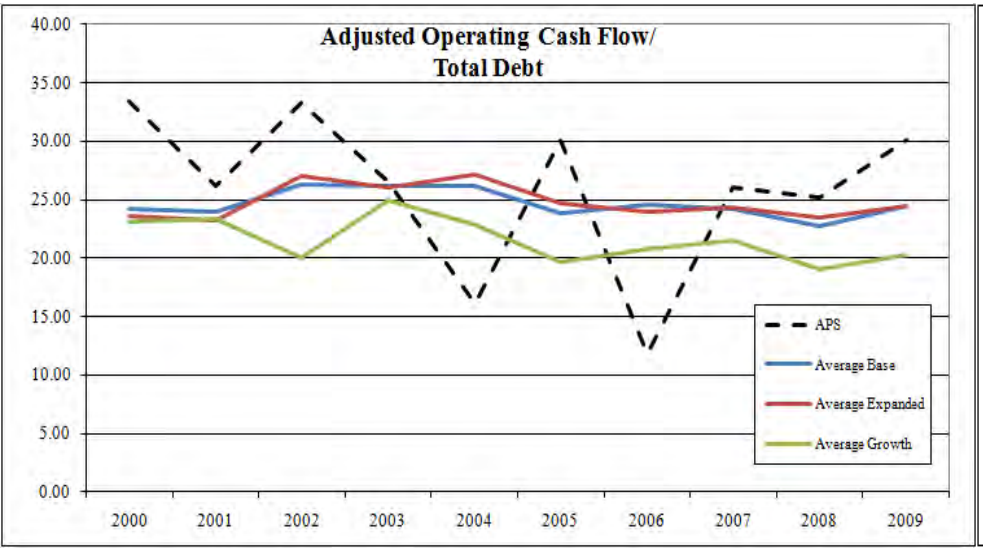
- *8. Total Debt/Capitalization Ratio*

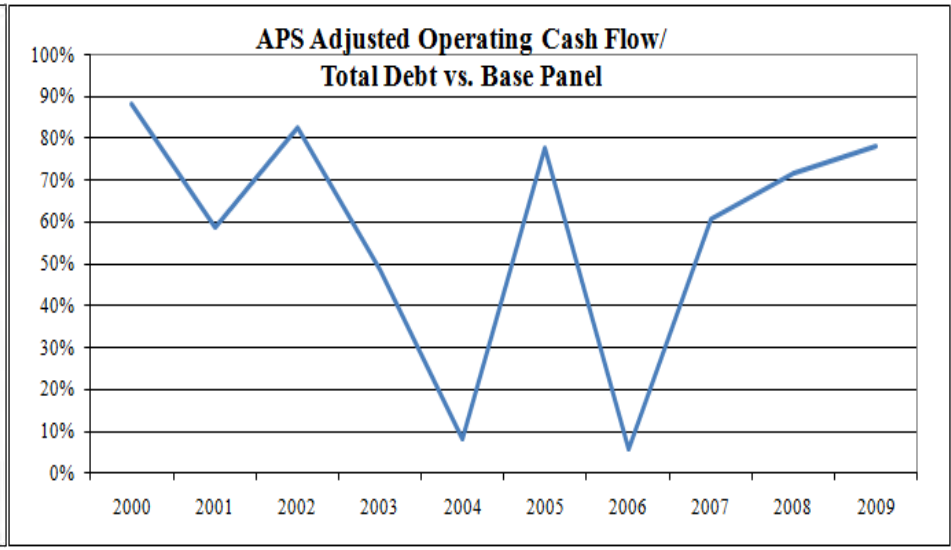
$$\frac{\text{Total Debt}}{\text{Total Capitalization}}$$

Debt/Cap.

CF/Debt

5. Adjusted Operating Cash Flow/Debt





- APS' ratio is volatile, indicating cash flow "busts" in 2004 and 2006
- However, APS ratios are above the panels in every other year
- Rating agency adjustments to reflect the effect of PPAs, leases and pension/OPEB are very large for APS
- This "raw ratio" does not reflect the rating agency adjustments, and does not provide the full story

Credit Metrics

S&P Adjustments – FFO/Debt

Rating agencies adjust both the cash flow numerator and debt denominator for the effects of PPAs, operating leases, and pension/OPEB obligations

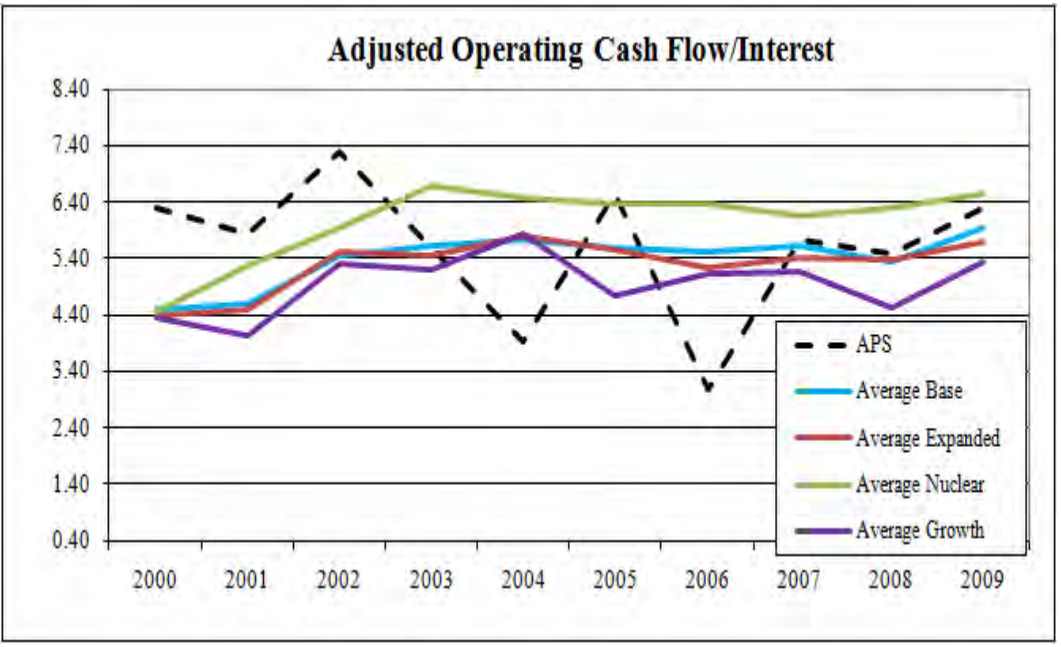
APS Ratios Before and After S&P Debt Imputation Adjustments

	12/31/2007	12/31/2008	12/31/2009	APS 3-Year Avg.	S&P Rating Category Fit w/ U.S. Utilities
Debt Imputed by S&P for:					
Operating leases	$ 432	$ 399	$ 331		
Pension/OPEB	$ 330	$ 442	$ 535		
Purchased Power contracts	$ 293	$ 282	$ 252		
Accrued Interest	-	$ 41	$ 55		
Additional Debt for Ratios	$ 1,055	$ 1,164	$ 1,173		
S&P FFO/Debt before Adj.	17.9%	20.2%	27.1%	21.7%	
S&P Ratio after Adj.	15.7%	16.9%	20.8%	17.8%	BBB
S&P FFO Int Coverage before Adj.	4.20	4.63	5.11	4.65	
S&P Ratio after Adj.	3.70	4.30	4.20	4.07	BBB
S&P Debt/Capital befor Adj.	50.7%	53.0%	53.2%	52.3%	
S&P Ratio after Adj.	57.0%	59.4%	59.8%	58.7%	BB

- S&P imputes additional debt of over $1 Billion to APS in each year from 2007-2009 for PPAs, leases and pension/OPEB
- S&P's adjustments reduce the FFO/Debt ratio by 2.2%, 3.3% and 6.3% in 2007-09, respectively

CF/Int.

6. Adjusted Operating Cash Flow/Interest Coverage



- APS raw interest coverage above or near panel averages except for 2004 and 2006
- Also does not reflect significant rating agency adjustments

APS Adjusted Operating Cash Flow/Interest vs. Base

Item	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
APS	6.30	5.83	7.29	5.59	3.94	6.54	3.07	5.72	5.48	6.29
APS % Rank	92%	73%	89%	66%	16%	74%	8%	60%	59%	74%
Average	4.48	4.60	5.43	5.61	5.72	5.59	5.53	5.62	5.35	5.94
Median	4.63	4.49	5.44	5.12	5.99	5.15	5.22	5.41	5.03	5.53

Credit Metrics

S&P Adjustments – FFO/Int

Rating agencies adjust both the cash flow numerator and interest denominator for the effects of PPAs, operating leases, and pension/OPEB obligations

APS Ratios Before and After S&P Debt Imputation Adjustments

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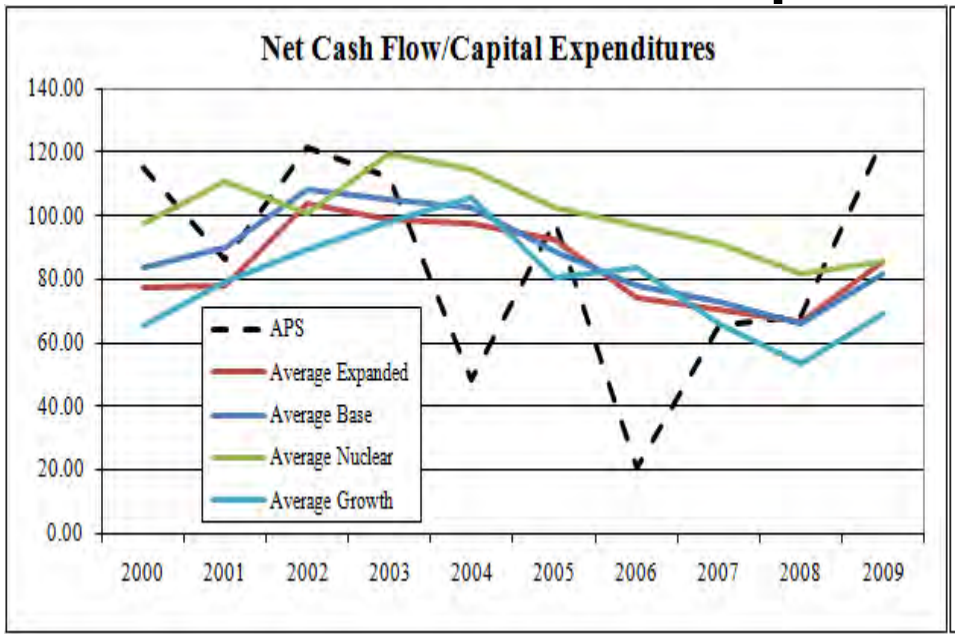
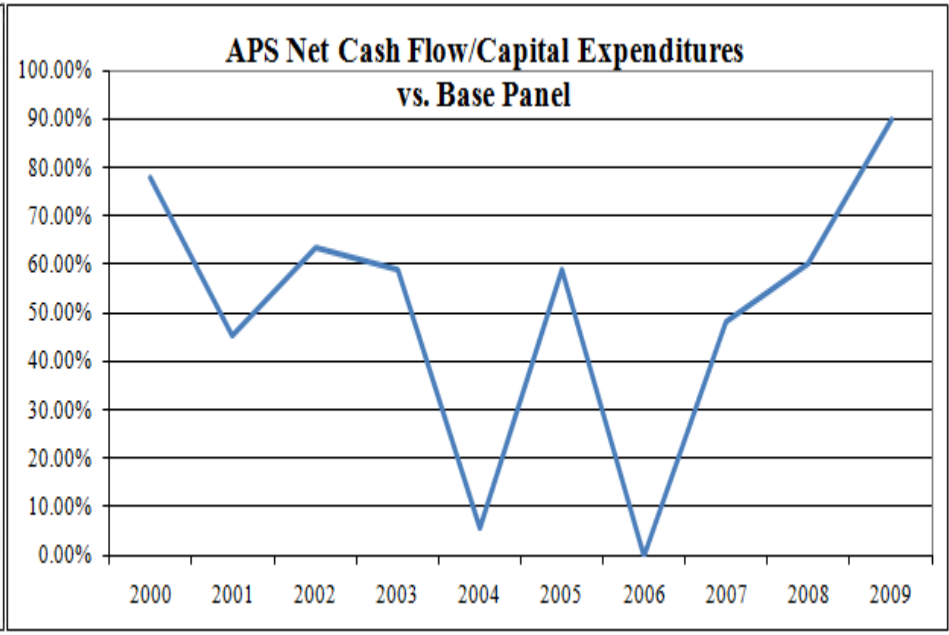
S&P FFO Int Coverage before Adj.	4.20	4.63	5.11	4.65	
S&P Ratio after Adj.	3.70	4.30	4.20	4.07	BBB
S&P Debt/Capital befor Adj.	50.7%	53.0%	53.2%	52.3%	
S&P Ratio after Adj.	57.0%	59.4%	59.8%	58.7%	BB

- S&P's adjustments reduce the FFO Interest Coverage by 0.5 times, 0.43 times and 0.91 times, respectively, in 2007-09

7. Net Cash Flow/Capital Expenditures

CF/CAPEX

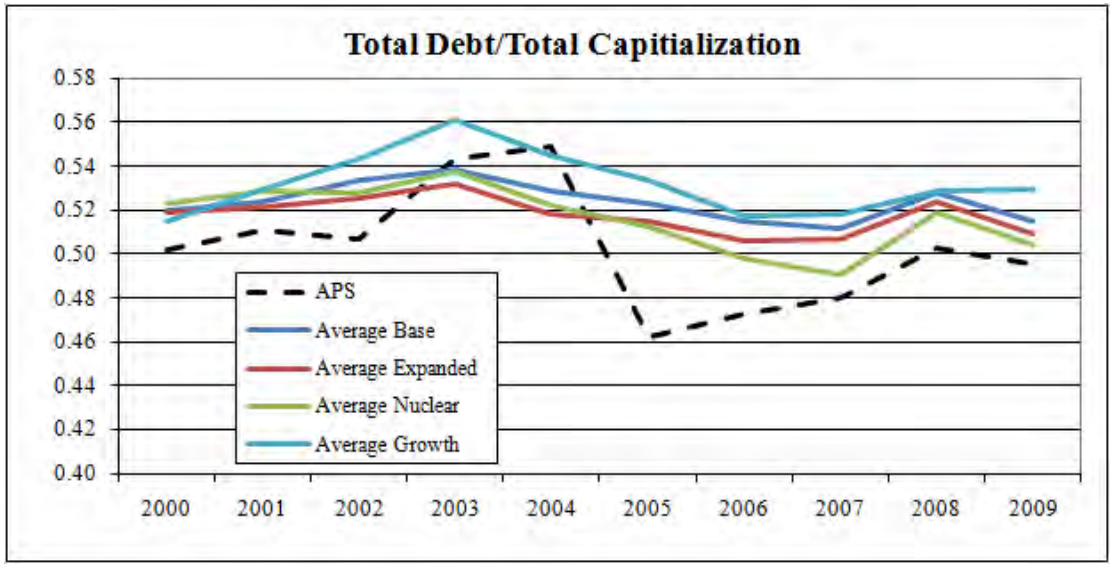




- APS internal funding of CAPEX has been at moderate-to-high levels, with the exceptions of 2004 and 2006
- Volatility of cash flow and periodic reliance on capital markets is a negative factor in APS' credit picture

8. Total Debt / Total Capitalization Ratio (w/out adjustments)

Debt/Cap.



- APS raw debt leverage is below all of the panels except for 2003 and 2004
- However, S&P imputes debt of over $1.1 Billion to APS for 2009 due to PPAs, leases and pension/OPEB underfunding

APS Total Debt/Total Capitalization vs. Base Panel

Item	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
APS	50%	51%	51%	54%	55%	46%	47%	48%	50%	50%
APS % Rank	50%	49%	37%	50%	69%	14%	21%	21%	31%	28%
Average	52%	52%	53%	54%	53%	52%	51%	51%	53%	51%
Median	50%	52%	54%	54%	52%	53%	52%	50%	53%	51%

S&P Adjustments – Debt/Capital

Rating agencies adjust the debt numerator and total capital denominator for the effects of PPAs, operating leases, and pension/OPEB obligations

APS Ratios Before and After S&P Debt Imputation Adjustments

	12/31/2007	12/31/2008	12/31/2009	APS 3-Year Avg.	S&P Rating Category Fit w/ U.S. Utilities
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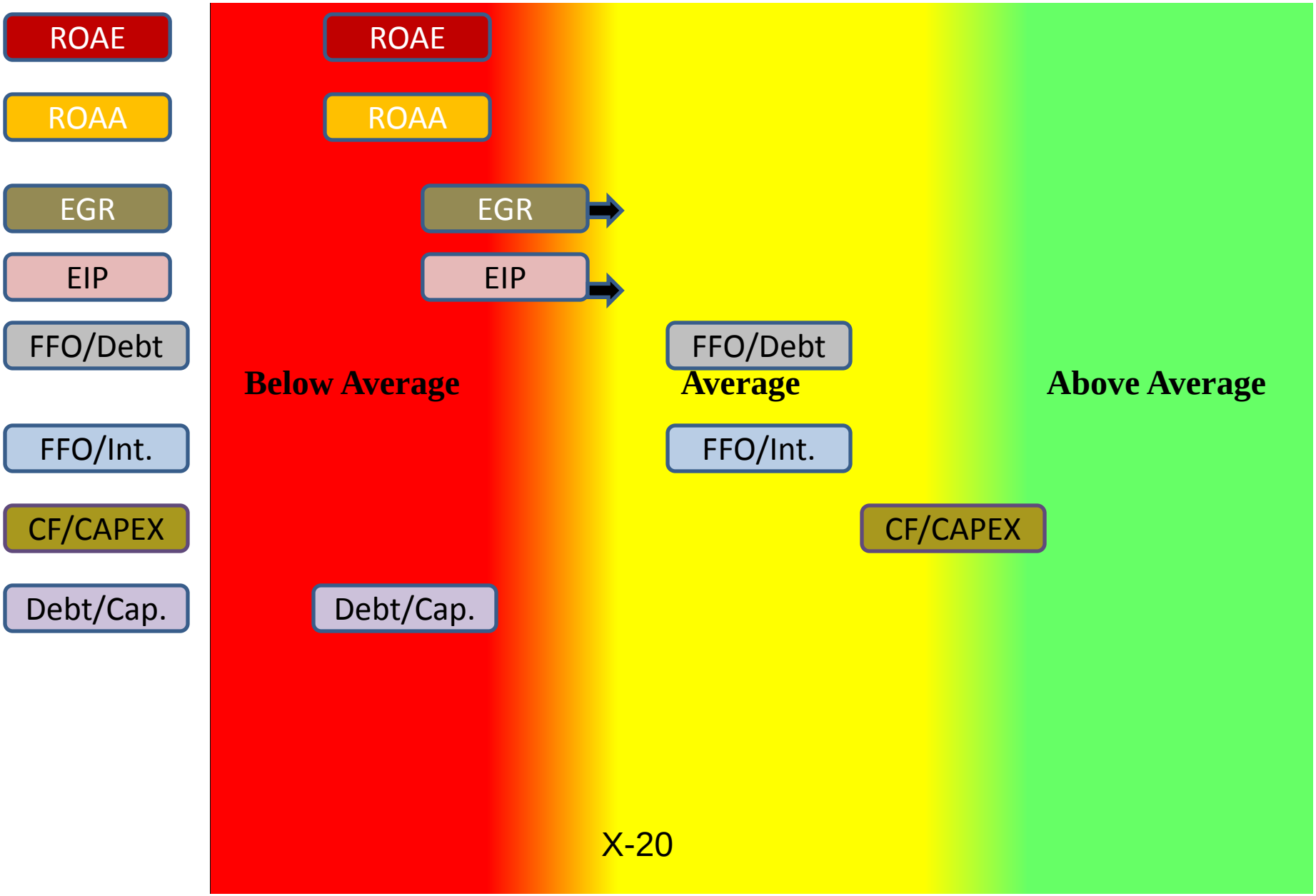
S&P Ratio after Adj.	57.0%	59.4%	59.8%	58.7%	BB

- S&P's adjustments add an average of 9 percentage points to the Debt/Capital ratio from 2007-2009
- The debt ratio is a major factor inhibiting APS credit rating improvement

APS Credit/Cash Flow Ranking with Adjustments



Other Fin. Measures

Other Financial Measures

Higher percentages of CWIP not in rate base can cause cash flow and liquidity problems

- *9. CWIP/Net Property, Plant and Equipment*

$$\frac{\text{CWIP}}{\text{Net PP\&E}}$$

CWIP/Net PP&E

High dividend levels to parent can cause inadequate utility equity

- *10. Dividend Payout Ratio to Parent*

$$\frac{\text{Dividends Paid to Parent}}{\text{Common Equity}}$$

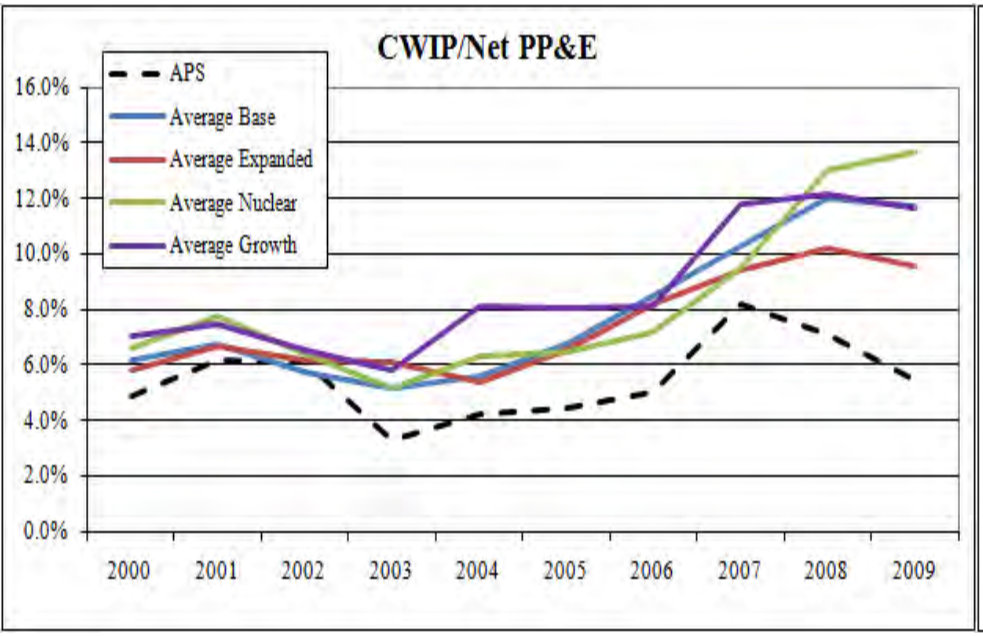
DPR

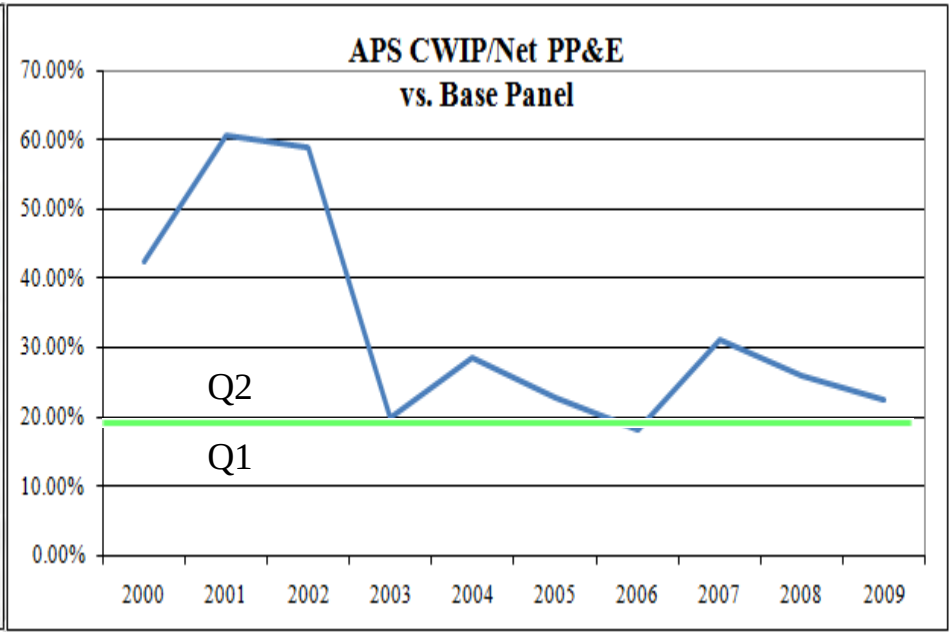
Credit ratings define business and financial risk levels and capital access

- *11. Debt and Commercial Paper Ratings*
  - **S&P**
  - **Moody's**
  - **Fitch**

Debt & CP Ratings

9. CWIP/Net PP&E

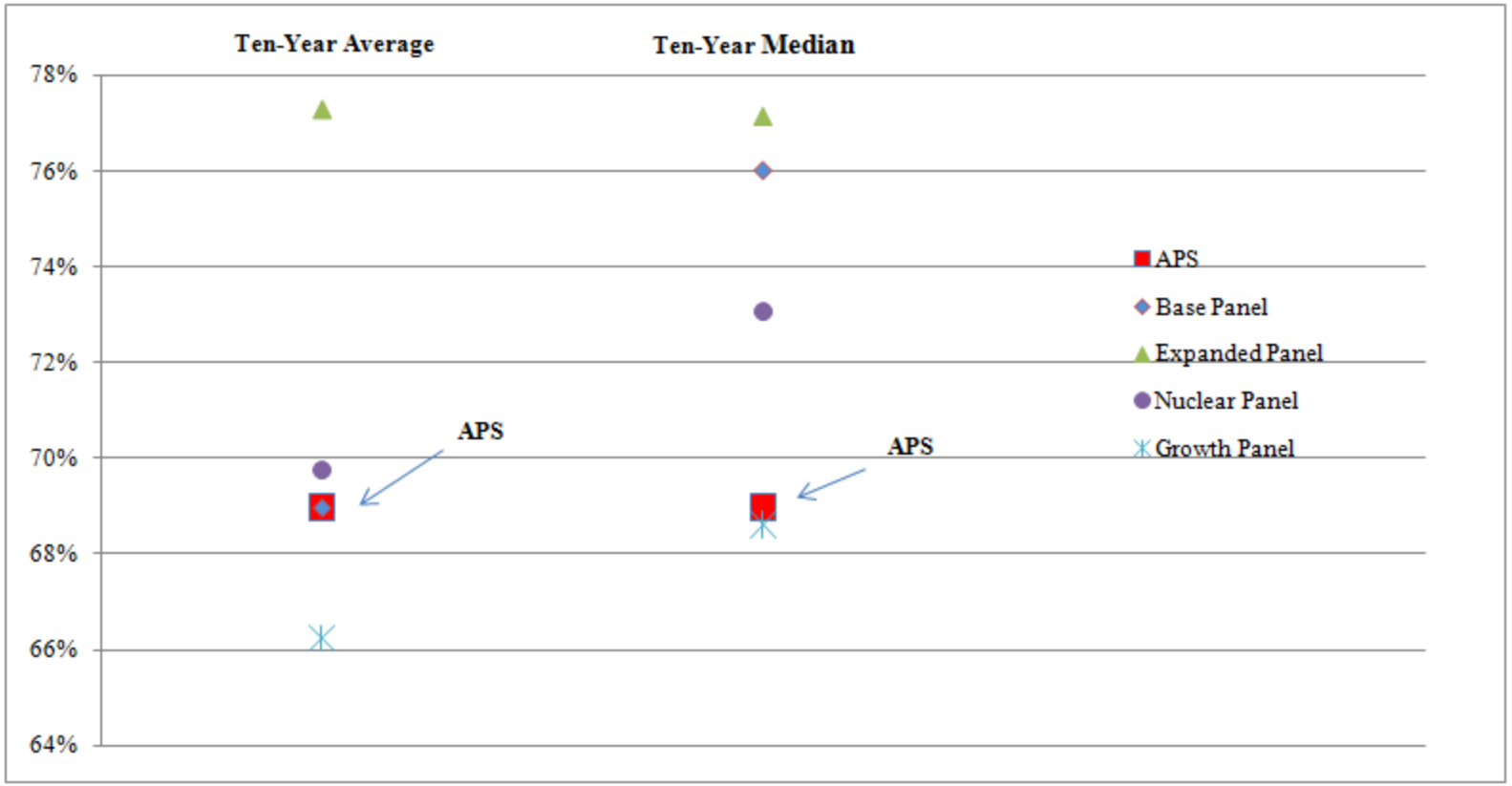




- APS CWIP as a percentage of Property, Plant and Equipment fell significantly from 2002-2006 and from 2007-2009, indicating reduced CAPEX levels and rate case re-sets of CWIP
- The comparative ranking with the base panel has improved to higher second quartile

10. Dividend Payout Ratio: 10-Year Look

DPR



- Average payout ratio over 10 years removes substantial annual volatility
- APS dividend payout is near the base panel average
- Payout ratio to parent is relevant only to maintaining an appropriate utility capital structure

11. APS Debt and Commercial Paper Ratings

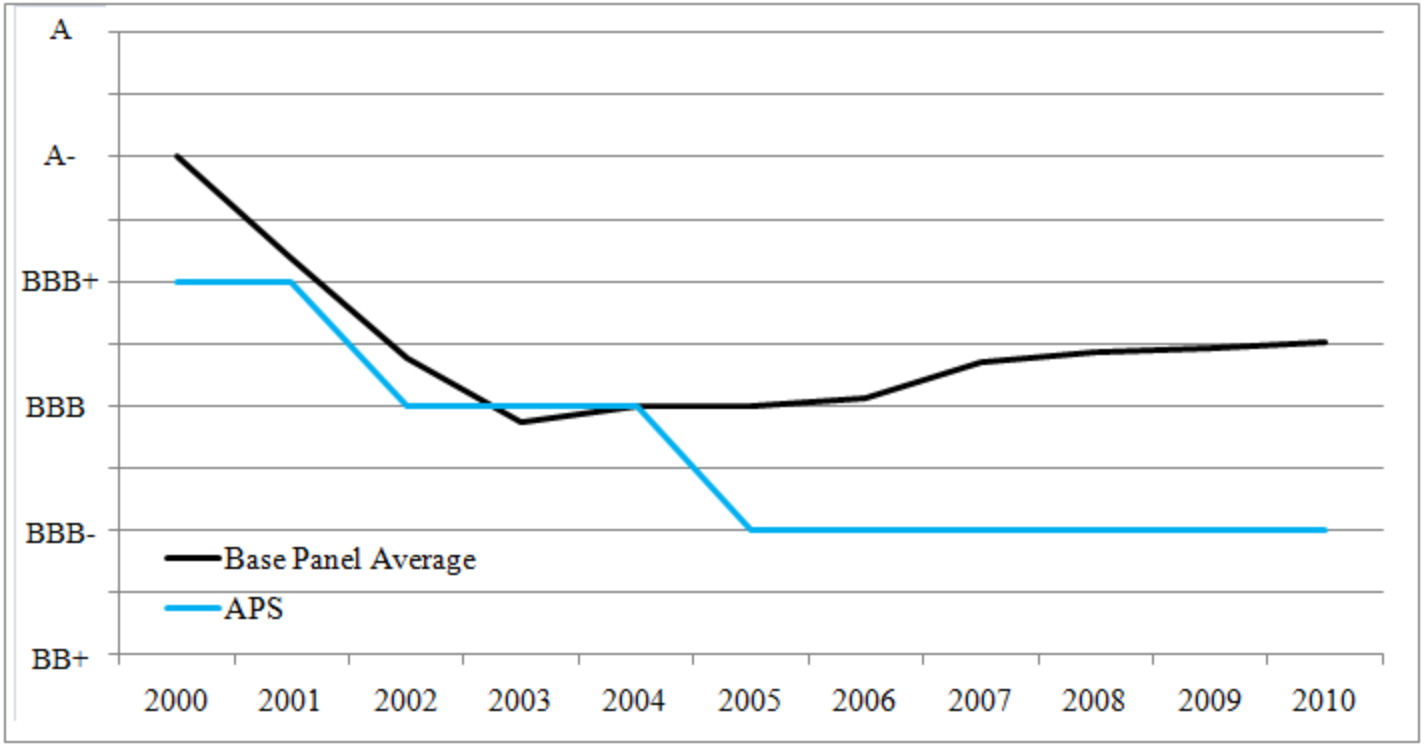
Debt & CP Ratings

	S&P	Moody's	Fitch
Long Term Issuer	BBB-	Baa2	BBB-
LTI Outlook	OP	OS	OS
Senior Unsecured	BBB-	Baa2	BBB
Short Term Commercial Paper	A-3	P-2	F3

- S&P and Fitch have recently revised credit outlooks on APS upward to the statuses shown
- Long-term issuer ratings for electric utilities currently average between BBB and BBB+, and A-2 for commercial paper
- APS long-term debt ratings do not yet reflect improved regulatory treatments and the cash flow and coverage indicators of the last 2-3 years
- Commercial paper ratings of A-3 and F-3 are linked to the BBB- APS issuer rating

12. Debt and Commercial Paper Ratings vs. Expanded Panel

Debt & CP Ratings



- APS was one ratings category below the expanded panel in 2005 and 2006, and about 1.5 categories below from 2007-2010
- Industry ratings have improved since 2006, while APS has not

Debt & CP Ratings

APS Credit Rating History

- Downgraded to BBB- and A-3 by S&P commercial paper in late 2005
- Fuel recovery and effect on cash flow and liquidity were key issues
- Investment-grade “cliff” was a primary issue in 2006 and 2008 rate cases
- No ratings level improvement to date despite strength of some credit metrics (FFO/Debt, FFO Interest Coverage)

2008 Rate Case and Settlement

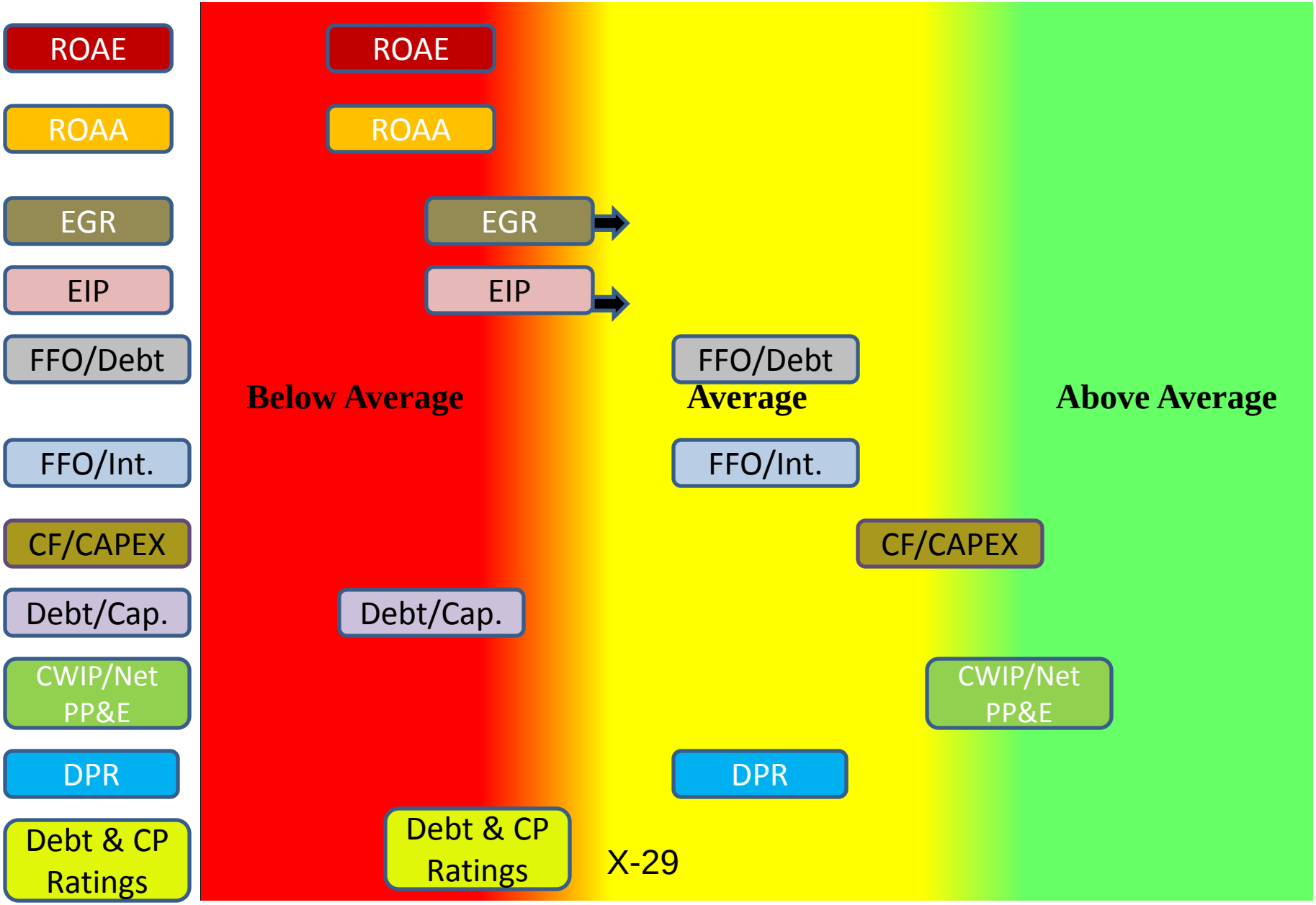
- APS rate case Settlement in 2009 was positive for credit status: commitment to adjusted Debt Ratio reduction to 52%; $700 MM of new equity; $30 MM per year expense reduction; ability to update rate base; favorable treatment of solar projects
- S&P April 2010: ***"… recent rate activity indicates that the company's management of regulatory risk may have improved."***
- APS Finance Plan also proposes streamlined rate case process to reduce regulatory lag
- APS Plan proposes to mitigate negative effects of PPAs, leases
- S&P: ***"We could raise the rating if the company continues to improve its management of regulatory relationships and the balance sheet is deleveraged."***

Debt & CP Ratings

APS Current Credit Status

- S&P and Fitch have recently raised APS' credit outlook (2010)
- S&P raised APS' business environment rating and credit outlook at same time
- S&P : ***The positive outlook reflects our assessment of an improving business profile exemplified by management's recent success in regulatory filings combined with progress in the disposition of remaining non-utility assets. The strengthened business profile may lead to higher ratings in the 12- to 18- month time frame, provided the company is able to manage service area growth and costs prudently and sustain financial metrics consistent with our forecast expectations of adjusted FFO to debt of more than 17 percent and adjusted debt to capital of less than 56 percent.***
- APS is now focused on debt and capital structure management, operating expense reduction and rate case efficiency

APS Financial Metrics



Liberty Finance Conclusions Summary

- *Long-term debt and commercial paper credit ratings have been at minimum investment grade levels since late 2005, currently 1.5 levels below panel average*
- *Key cash flow to debt and interest metrics map to BBB/A-2 levels and improving*
- *Business environment rating and debt leverage have been a drag on APS credit ratings for several years*
- *APS business environment has recently been upgraded; debt level needs to improve for credit upgrades*
- *APS' ROE and ROA are well below all of the comparative panels from 2002-2009*
- *High growth in APS' CAPEX and operating expenses combined with historical test periods has seemingly caused consistent earnings attrition*
- *APS earnings growth rates were negative and far below other panels for 2000-2005, and near averages for 2004-2009*
- *APS as an investment for the parent has was also negative for the first half of the period and average for the past 5 years*

Potential Areas for Action Plans - Finance

- Evaluate specific drivers and causes for consistently low APS rates of return
- Specific analysis of whether APS Finance Plan and Settlement will improve credit ratings to BBB or BBB+/A-2
- Determine how the credit rating effects of PPAs, operating leases and pension/OPEB may be economically mitigated
- Determine the if APS' targeted adjusted debt level of 52% will provide desired results

APS Benchmarking Analysis

Exhibit XI

Hedging

Challenges

- Hedging data and information deemed highly proprietary by its owners
- Minimal reporting
  - Non-uniform and non-standard where it is available
- Geographic location affects strategies
  - (*e.g.*, location with respect to physical trading points)
- Utilities generally reluctant to share hedging practices and results with regulators
  - Utility concerns about “heads you win, tails I lose” treatment of gains and losses
  - No regulatory policy statements on hedging in many jurisdictions
  - Potential for higher than average financial risk area

Previous Reviews of Hedging

- **Liberty Consulting – 2006**
  - Audit of APS fuel and purchased power procurement practices and costs
  - Liberty selected by Commission after RFP process
  - Liberty report dated August 31, 2006
  - Included hedging and risk management

- **R. W. Beck – 2006**
  - Required by Commission by Decision No. 68685
  - Commission directed APS to work in conjunction with Staff
  - Report dated November 1, 2006
  - Independent benchmarking assessment of APS hedging, with specific focus on natural gas

Liberty Consulting Audit and Report - 2006

- Reviewed goals, strategy, procedures, practices of hedging program
- Based upon interviews, document reviews , and site visits to front office (trading floor), middle and back offices (accounting and controls) ; included interviews on trading floor
- Liberty conclusions:
  - APS has designed and operates a sound hedging program
  - The program has been successful in meeting its primary objective
  - The program will prevent costs from falling
  - Segregation of utility and non-utility hedging activities is not as complete as it should be.
- Liberty Recommendations:
  - Engage stakeholders in a discussion of hedging program objectives.
  - Report to the Commission on future plans for non-utility activities.
- APS Follow-up Actions
  - APS provided a workshop on hedging to the Resource Alternative Planning Stakeholder Meeting Group in March 2008.
  - APS reported that it terminated all non-utility gas and power commodity activities as of 12/31/08.

RW Beck Study and Report - 2006

- Benchmarking assessment of APS's fuel hedging program
  - Specific focus on natural gas, including overall design and process, and quality of program and associated transactions
- Primary source of information was a survey
  - Beck sent out surveys to 35 utilities, received 12 responses
  - Respondents self-selected; results unaudited
- RW Beck Conclusions
  - APS's approach to risk analytics and limits is consistent with industry practice.
  - APS has implemented hedging parameters and limits based on volumetric parameters, also consistent with industry standards.
  - APS considers the correlation between natural gas prices and power prices as part of its analysis, which is a positive attribute.
  - APS hedges an appropriate amount of natural gas given its goals, financial condition and level of exposure to natural gas prices.
  - APS's hedging activities appear to have provided significant protection to customers from higher fuel-related net costs than would have otherwise occurred.

Liberty's Panel and Data Development

- This analysis complements the previous studies
  - Liberty analyzed APS's performance in depth
  - Beck surveyed other utilities
- For this analysis, potential panel candidates were identified from universe of those utilities which met the following criteria:
  - Utilities for which independent third party audit reports of their hedging programs were performed
  - Reports on those audits were publicly available
  - Included electric and/or gas hedging
- Qualifiers
  - Physical gas storage is widely used in the natural gas industry and is not considered hedging for these purposes.
  - Storage arbitrage would be considered a hedging technique but was not utilized by any of the companies in the panel.
  - Individual utility data is from different periods; range from 2003 – 2009
- Primary criterion for panel selection was availability of data

Selected Panel

Utility	State	Report Date	Commodity	Regulatory Authorization
Arizona Public Service	AZ	---	Elec, Gas[1]	Permitted
Washington Gas Light	MD	2010	Gas	By specific order
Elizabethtown Gas	NJ	2009	Gas	Authorized and promoted
New Jersey Natural Gas	NJ	2009	Gas	Authorized and promoted; some incentives
Public Service E&G	NJ	2009	Gas	Authorized and promoted
South Jersey Gas	NJ	2009	Gas	Authorized and promoted; some incentives
Consolidated Edison	NY	2009	Elec, Gas[2]	Required, within general guidelines
National Grid (NMPC)	NY	2010	Elec	Required, within general guidelines
Orange & Rockland	NY	2009	Elec	Required, within general guidelines
Columbia of Ohio	Ohio	2008	Gas	Permitted
Dominion East Ohio	Ohio	2006	Gas	Permitted
Duke Energy Ohio	Ohio	2007	Gas	Permitted
Vectren of Ohio	Ohio	2003	Gas	Permitted
1 Gas for generation 2 Gas for steam/electric cogen				

Parameters Evaluated

- Commodities hedged include Electricity, Gas for Generation, Gas for utility distribution service
- Physical hedges – contracts for future physical delivery
- Financial hedges – various types financial instruments
- Governance Practices
  - Executive level awareness
  - Risk management committee at high level in organization
  - Written policies and procedures
  - Approved products and services
- Operational Practices
  - Programmatic, non-discretionary trading
  - Target hedge ratios
  - Regular reporting
  - Separation of duties
  - Independent verification
  - Approved products and services

Governance Parameters

Utility	Executive Level Awareness	Risk Mgmt Committee	Policies & Procedures	Approved Products and Instruments
Arizona Public Service	x	x	x	x
Wash Gas Light	x	x	x	x
Elizabethtown Gas	x	x	x	x
New Jersey Natural Gas	x	x	x	x
Public Service E&G	x	x	x	x
South Jersey Gas	x	x	x	x
Consolidated Edison	x	x	x	x
National Grid (NMPC)	x	x	x	x
Orange & Rockland	x	x	x	x
Columbia of Ohio	x	x	x	x
Dominion East Ohio	N/A	N/A	No	N/A
Duke Energy Ohio	x	x	x	x
Vectren of Ohio	x	x	No	x

Operational Parameters

Utility	Physical vs. Financial Hedges	Program-matic Trading (Non-disc.)	Target Hedge Ratios	Maximum Forward Period Hedged	Regular Reporting	Separation of duties	Independ. Verif.
Arizona Public Service	Financial	x	x	36 months	x	x	x
Washington Gas Light	Both	x	x	Next 2 Seasons	x	x	x
Elizabethtown Gas	Both	Primarily	No	18 months	x	x	x
New Jersey Natural Gas	Both	Primarily	x	18 months	x	x	x
Public Service E&G	Physical	x	No	18 months	x	x	x
South Jersey Gas	Both	Primarily	No	18 months	x	x	x
Consolidated Edison	Financial	Primarily	No	36 months	x	x	N/A
National Grid (Niag Mohawk)	Both (90/10)	Primarily	No	N/A	x	x	N/A
Orange & Rockland	Financial	N/A	N/A	N/A	x	x	N/A
Columbia of Ohio	Physical	x	x	36 months	x	No	N/A
Dominion East Ohio	Physical	x	No	Next winter season	Informal	x	x
Duke Energy Ohio	Physical	No	No	36 months	x	N/A	N/A
Vectren of Ohio	Physical	x	x	15 months	N/a	N/A	No

General Observations

- Utilities sensitive to regulatory perceptions of their hedging programs.
- Without Commission approval hedging programs, utilities tend to view hedging as a "no-win."
- Virtually all utilities stated purposes for hedging is to mitigate price volatility.
- Strong controls necessary to overcome the urge to beat the market.
- Reasonable level of executive level awareness of hedge programs.
- Utility hedge programs generally conservative/unsophisticated.
- Preference for physical hedges over financial hedges.
- Most hedges extend a maximum of 18 months; longest forward period is 36 months.
- Minimal use of storage optimization (adjusting injection and withdrawal schedules).
- Programs generally non-responsive to market changes.
- No explicit balancing of upside and downside risks; *e.g.*, balancing risk of price increases and decreases

Best Practices - General

- Best Practices are defined as best of those used in the utility industry

- Policy Level
  - Objectives should be risk-oriented, not profit-oriented.
  - Any program designed to beat the market should be avoided.
  - Diversity is critical.
  - Regulatory commission buy-in, at some level, is important for a successful hedge program.

Best Practices – Governance & Management

Practice Area	APS	Comments
Executive Level Awareness	x	Senior officers involved
Written Policy	x	Stand-alone hedging policy
Written Procedures	x	Hedging strategy document
Risk Management Committee	x	Chartered, recently reconfigured
Regular Committee Meetings	x	Bimonthly
Delegation of Authority	x	Specified in strategy document
Trading Limits by Job Level	x	Limited by allowed hedge quantities
Approved Products & Instruments	x	Specified in strategy document
Separation of Duties	x	Front, middle, back office separation
Independent Verification	x	By Enterprise Risk Management group

Best Practices – Operations

Practice Area	APS	Comments
Programmatic Trading	x	Specified in strategy document
Target Hedge Ratios	x	Specified by quarter
Specified Maximum Forward Period	x	36 months
Responsive to Market Changes	x	Within limits of allowed hedge ratios
Gas Storage Optimization	x	N/A
Regular Reporting	x	Daily, weekly, monthly

Conclusions

- APS performance is strong with respect to policy level best practices and governance and operational parameters.
  - This is consistent with the findings of the previous Liberty and RW Beck reviews.
- There is a wide range of variability within each parameter, e.g., the existence of written policies and procedures does not indicate whether they are appropriate, effective or effectively implemented.
- The parameters examined here should be viewed as minimal requirements for a hedging program. The lack of a good database precludes drawing any further conclusions.
- Generally, the industry tends to favor programmatic trading and not respond to market changes.

Funds Paid among Affiliates

Background

- Utility payments to affiliates are driven by two principal factors:
  - Use of a common provider (service company) to serve multiple utility operations
  - Nature, size, complexity of non-utility operations
- Even among holding companies with similar numbers of utility and non-utility operations, payments can vary widely
  - Some provide only common A&G services; others provide substantial common technical and operating services to utilities
  - Some operate non-utility businesses virtually stand-alone; others provide many A&G services to utility and to non-utility affiliates
- There is not a good, readily available source of affiliate payment data
  - FERC Form 60, which is filed by service companies having multi-state utility affiliates, might be useful but APS/Pinnacle West is not required to file
  - In any event, Pinnacle West does not have a service company
- Even if one could get common, reliable affiliate transaction data; there is no way to compare the level of goods/services provided
  - Data showing volumes/levels of goods and services not available
  - Therefore, cannot determine value, (i.e., unit costs/prices of services)
- Liberty has performed 20 or more affiliate cost and relationship assessments and audits
  - We have not seen benchmarking in any of those instances
  - We have not found benchmarking a useful exercise in examining cross subsidization issues

Pinnacle West Affiliates

- No service company
- Three principal non-utility affiliates:
  - SunCor Development Company
  - APS Energy Services Company, Inc.
  - El Dorado Investment Company
- A fourth, Pinnacle West Marketing & Trading Co., LLC
  - Is winding down
  - Began in early 2007 to conduct operations previously under a division of Pinnacle West through the end of 2006
  - By the end of 2008, substantially all the contracts were transferred to APS or expired.

Pinnacle West Affiliates
SunCor Development Company

- Developer of residential, commercial, industrial real estate projects in Arizona, Idaho, New Mexico and Utah.
- Pinnacle West reports attempting to sell SunCor's assets.
  - Remaining assets include land with improvements, commercial buildings, and golf courses.
  - Remaining projects include master-planned communities, and commercial and other residential. There were about 260 employees. Its revenues were about $103 million in 2009.
- Its dividends (2007 through 2009) to Pinnacle West were $5 million (about 1% of APS's $510 million distributions to Pinnacle West).
  - No cash distributions from SunCor to Pinnacle West in 2009 because of restrictive covenants.
- No reported charges for good or services either to or from APS.

Pinnacle West Affiliates
APS Energy Services Company, Inc. (APSES)

- APSES provides energy-related products and services
  - E.g.; energy master planning, energy use consultation and facility audits, cogeneration analysis and installation, and project management)
  - Focus on energy efficiency and renewable energy to commercial and industrial retail customers in western US.
  - Also owns and operates district cooling systems.
- About 70 employees.
- The combined operating revenues of El Dorado and APSES were no more than $44.8 million in 2009.
  - Operating revenues were not separately reported for El Dorado and APSES.
- APSES had a net loss of $2 million in 2009.
- There were no reported charges for good or services either to or from APS.

Pinnacle West Affiliates
El Dorado Investment Company

- El Dorado owns minority interests in several energy-related investments and Arizona community-based ventures.
- Pinnacle West reports that it may use El Dorado for investments strategic to the business of generating, distributing and marketing electricity.
- No reported employees.
- The combined operating revenues of El Dorado and APSES were no more than $44.8 million in 2009. (Operating revenues were not separately reported for El Dorado and APSES.)
- El Dorado had a net loss of $7 million in 2009.
- There were no reported charges for goods or services either to or from APS.

Affiliate Cost Hypotheses

Given the Lack and Comparability of Available Data, We Should Look to the Question of Rate Risk to Identify Benchmarking Opportunities

- Payments among affiliates have potentially material risks and impacts to rate setting to the extent there are:
  - Significant levels of common services to multiple utility affiliates
  - Significant utility common costs across state borders
  - Significant levels of common services to utility and non-utility affiliates
  - Significant purchases/sales (e.g., power) between utility entities or from/to non-utility affiliates

- The first two risks do not exist at Pinnacle West because there is only one utility (electricity) operating in one state

- Absent significantly sized non-utility operations, any common services (the third risk) present a low cross-subsidization threat

- Absent significant levels of purchases/sales between APS and non-utility affiliates, the fourth risk also presents a low cross-subsidization threat

Objectives

Given Data Limitations and Risk Assessment, We Decided:

- To compare the size of Pinnacle West's non-utility operations against other single-state holding companies, in order to gauge cross-subsidization potential

- To determine whether APS purchases/sales to affiliates are at levels sufficient to create significant cross-subsidization risk

- Not to test the question of common services among multiple utility operations, as Pinnacle West has only a single-state/single-service utility and, in any case, the non-utility affiliates do not provide goods or services to APS

Panel and Data Development

- Potential panel candidates were identified from several databases, including DOE/EIA, EEI, and SEC.
- Researched 2009 data from several sources, including SEC 10-Ks, holdco and utility web sites, and shareholder corporate reports.
- Revenue, asset and employee data were the most relevant of the available data for comparison, and the most readily available parameters.
- While Form 60 filers (as service companies serving operations in multiple states) are distinguishable from Pinnacle West, looking at their costs may shed light on the degree of APS cross subsidization risk.

Our Three Parameters

- Utility and Non-Utility Revenues
- Utility and Non-Utility Assets
- Utility and Non-Utility Employees

- Best available parameters to enable comparisons
- Selected “utility” and “non-utility” categories
- The “non-utility’ category includes data associated with non-utility affiliates and the parent.

Limitations of Data

We found inconsistencies in reported data.

- Some 10-Ks reported more robust data by business segment, e.g. “gas business” and “electric business” as opposed to the consolidated G&E utility.

- A number of 10-Ks did not report parameter data for each 1st tier non-regulated subsidiary.

- Little consistency among types of (non-utility) affiliates

Single-State Holding Company Panel

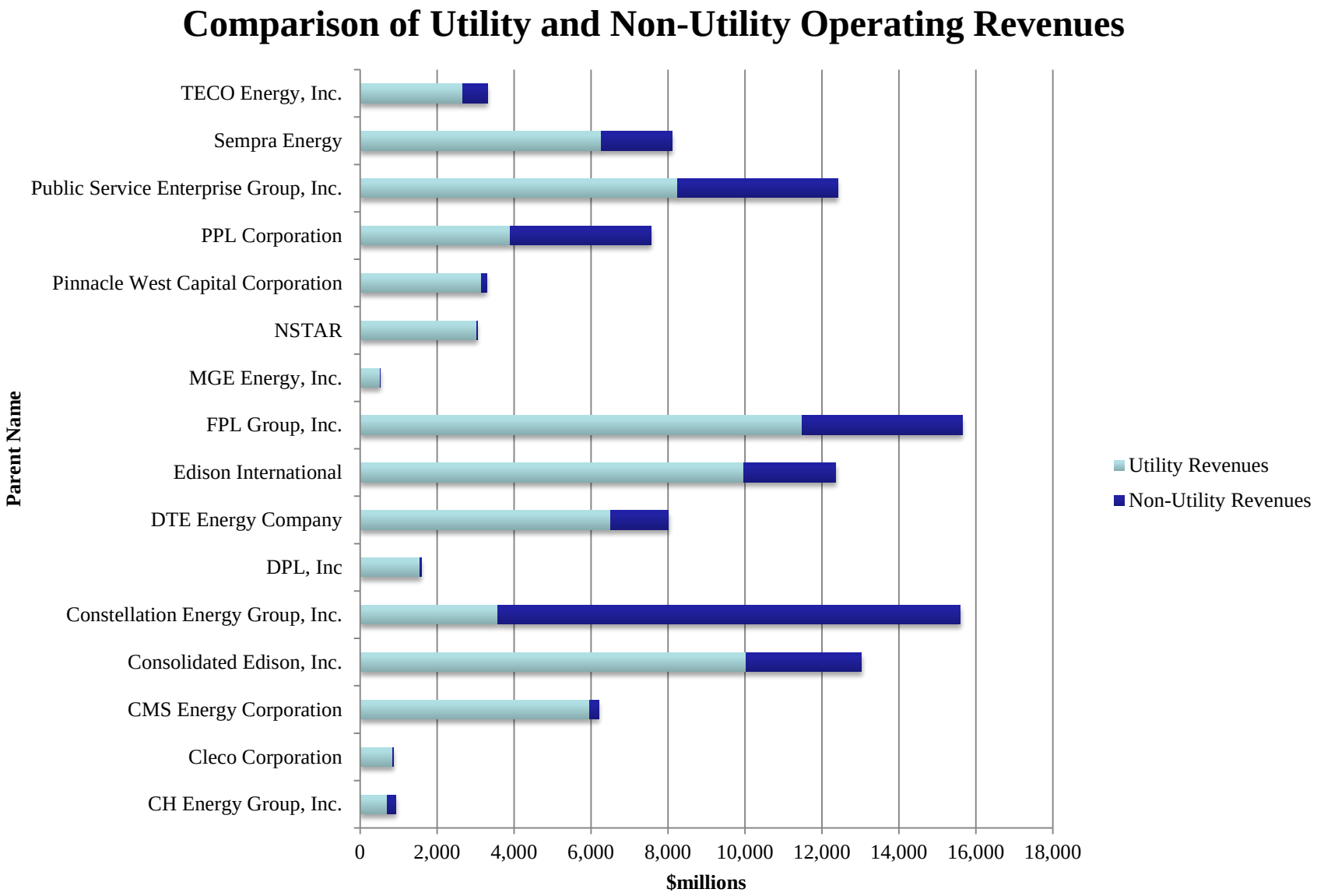
Parent Name	State	Utilities	E/G	1st Tier Non-Utility Subs
CH Energy Group, Inc.	NY	1	E&G	3
Cleco Corporation	LA	1	E	2
CMS Energy Corporation	MI	1	E&G	2
Consolidated Edison, Inc. (note)	NY	2	E&G	3
Constellation Energy Group, Inc.	MD	1	E&G	7
DPL, Inc.	OH	1	E	3
DTE Energy Company	MI	3	E&G	5
Edison International	CA	1	E	2
FPL Group, Inc.	FL	1	E	2
MGE Energy, Inc.	WI	1	E&G	5
NSTAR	MA	1	E&G	3
Pinnacle West Capital Corporation	AZ	1	E	3
PPL Corporation	PA	1	E	2
Public Service Enterprise Group, Inc.	NJ	1	E&G	3
Sempra Energy	CA	2	E&G	4
TECO Energy, Inc.	FL	1	E&G	3

Note: Consolidated Edison, Inc. has a small level of utility operation in PA and NJ.

Types of Non-Utility Affiliates Within the Panel and Occurrences for Each

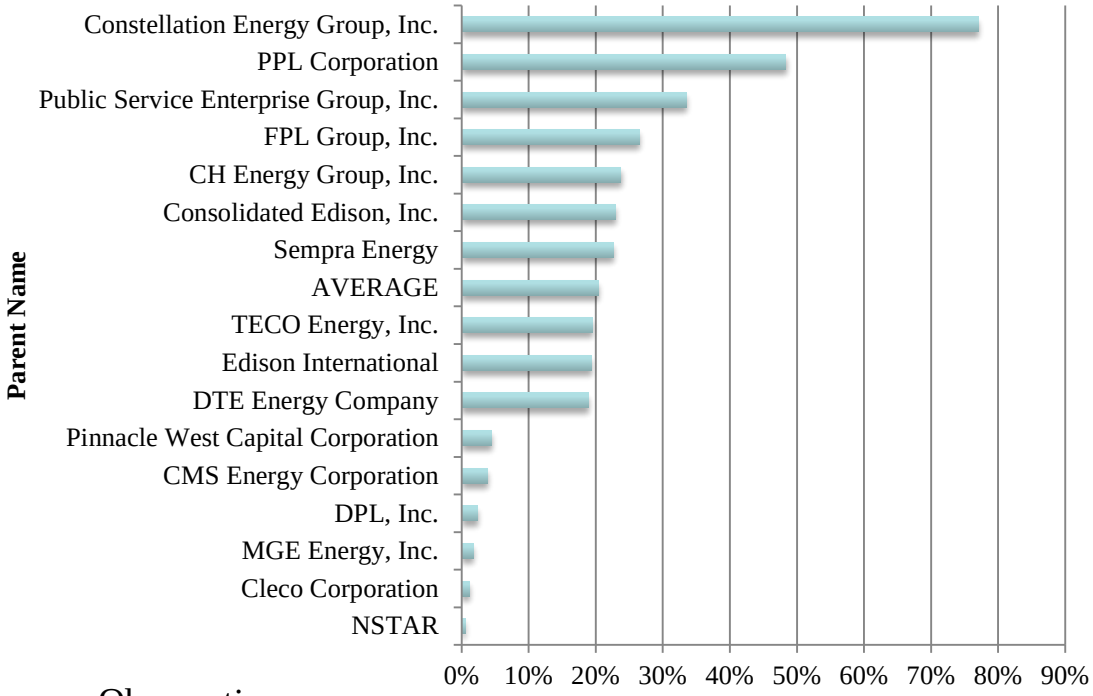
- Generating plants for use by the affiliate utility and/or as a merchant generator (12)
- Real estate, infrastructure or business development (5)
- Energy efficiency services (2)
- Wholesale procurement, marketing and trading (4)
- Renewable energy sources (biomass, landfill, wind) (5)
- Other energy-related products and services (6)
- Gas pipeline and storage (4)
- LNG operation (2)
- Bundled corporate management services provided to affiliates (2)
- Individual corporate services, such as financing (5)
- Telecommunications (1)
- Competitive retail sales (4)
- Coal mining, processing or transportation (3)
- International generation or energy delivery (2)

Funds Paid among Affiliates



Funds Paid among Affiliates

Non-Utility Revenues As a Percent of Total



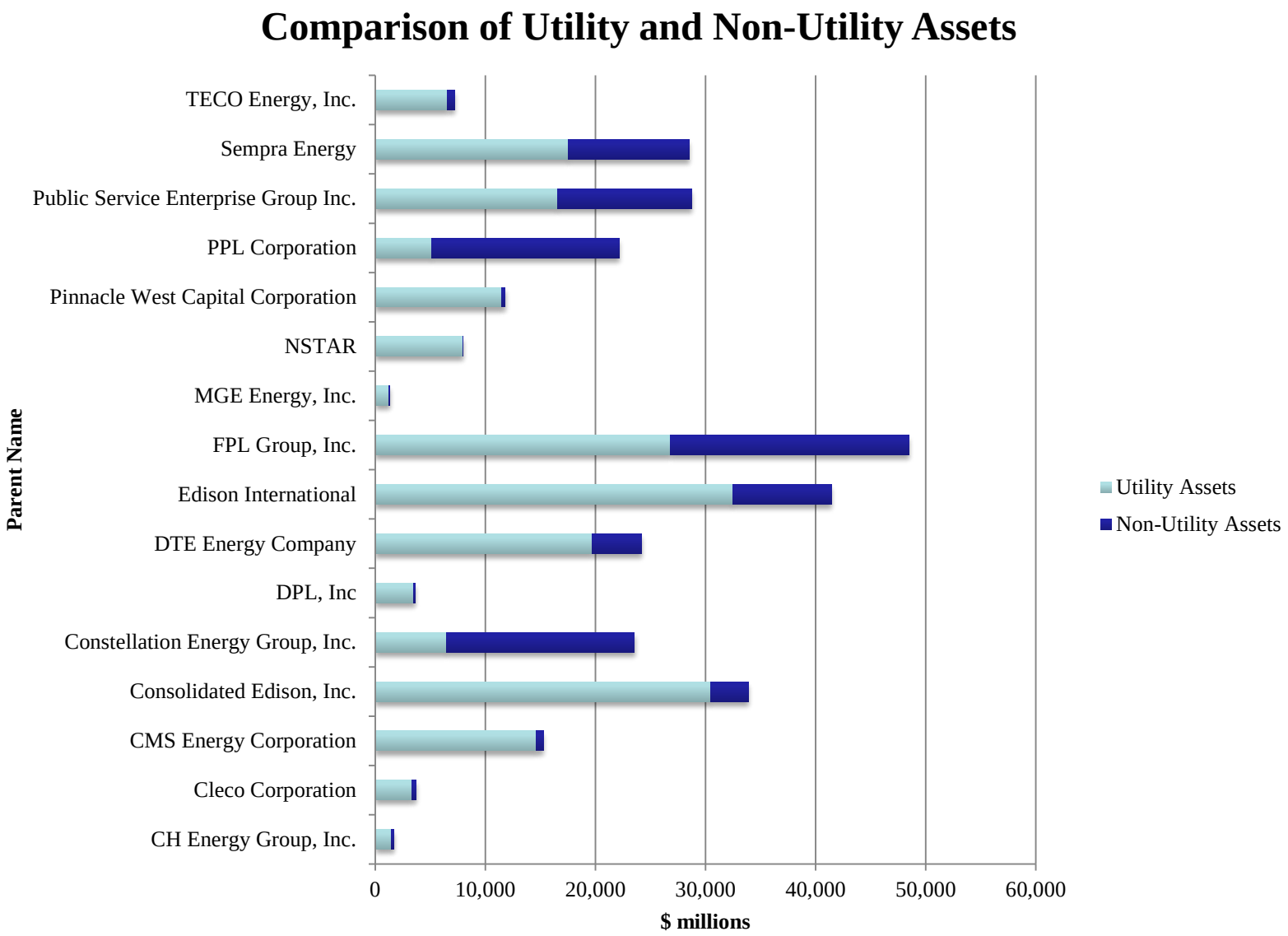
Parent Company	Non-Utility Revenues As a Percent of Total
NSTAR	1%
Cleco Corporation	1%
MGE Energy, Inc.	2%
DPL, Inc.	2%
CMS Energy Corporation	4%
Pinnacle West Capital Corporation	4%
DTE Energy Company	19%
Edison International	19%
TECO Energy, Inc.	19%
AVERAGE	20%
Sempra Energy	23%
Consolidated Edison, Inc.	23%
CH Energy Group, Inc.	24%
FPL Group, Inc.	27%
Public Service Enterprise Group, Inc.	34%
PPL Corporation	48%
Constellation Energy Group, Inc.	77%

Observations:

About 4% of Pinnacle West's total revenues are derived from non-utility sources, which places the company at the low end of the range of the panel members, well below the panel average and median, and at a level best matching the members in the lowest quartile in terms of non-utility revenues.

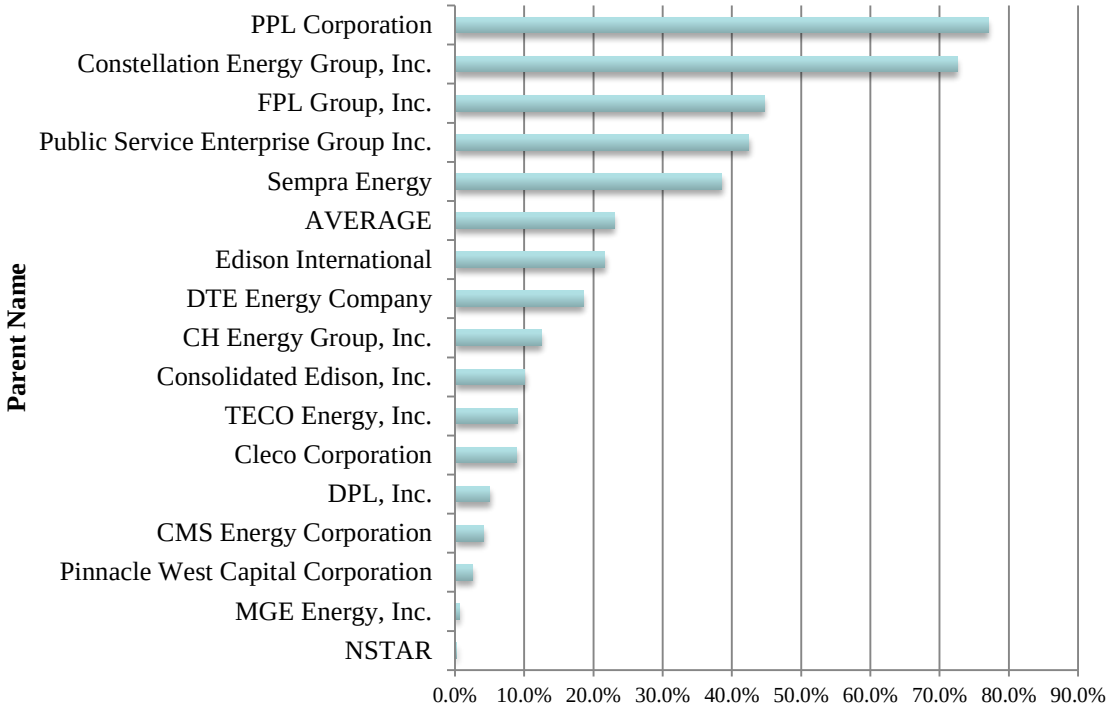
Constellation Energy Group, Inc. sold in 2009 significant amounts of merchant generation, accounting for its highest position in the panel.

Funds Paid among Affiliates



Funds Paid among Affiliates

Non-Utility Assets As a Percent of Total



Parent Company	Non-Utility Assets As a Percent of Total
NSTAR	0.3%
MGE Energy, Inc.	0.6%
Pinnacle West Capital Corporation	2.6%
CMS Energy Corporation	4.2%
DPL, Inc.	5.1%
Cleco Corporation	9.0%
TECO Energy, Inc.	9.0%
Consolidated Edison, Inc.	10.1%
CH Energy Group, Inc.	12.5%
DTE Energy Company	18.5%
Edison International	21.6%
AVERAGE	23.0%
Sempra Energy	38.6%
Public Service Enterprise Group Inc.	42.5%
FPL Group, Inc.	44.7%
Constellation Energy Group, Inc.	72.6%
PPL Corporation	77.0%

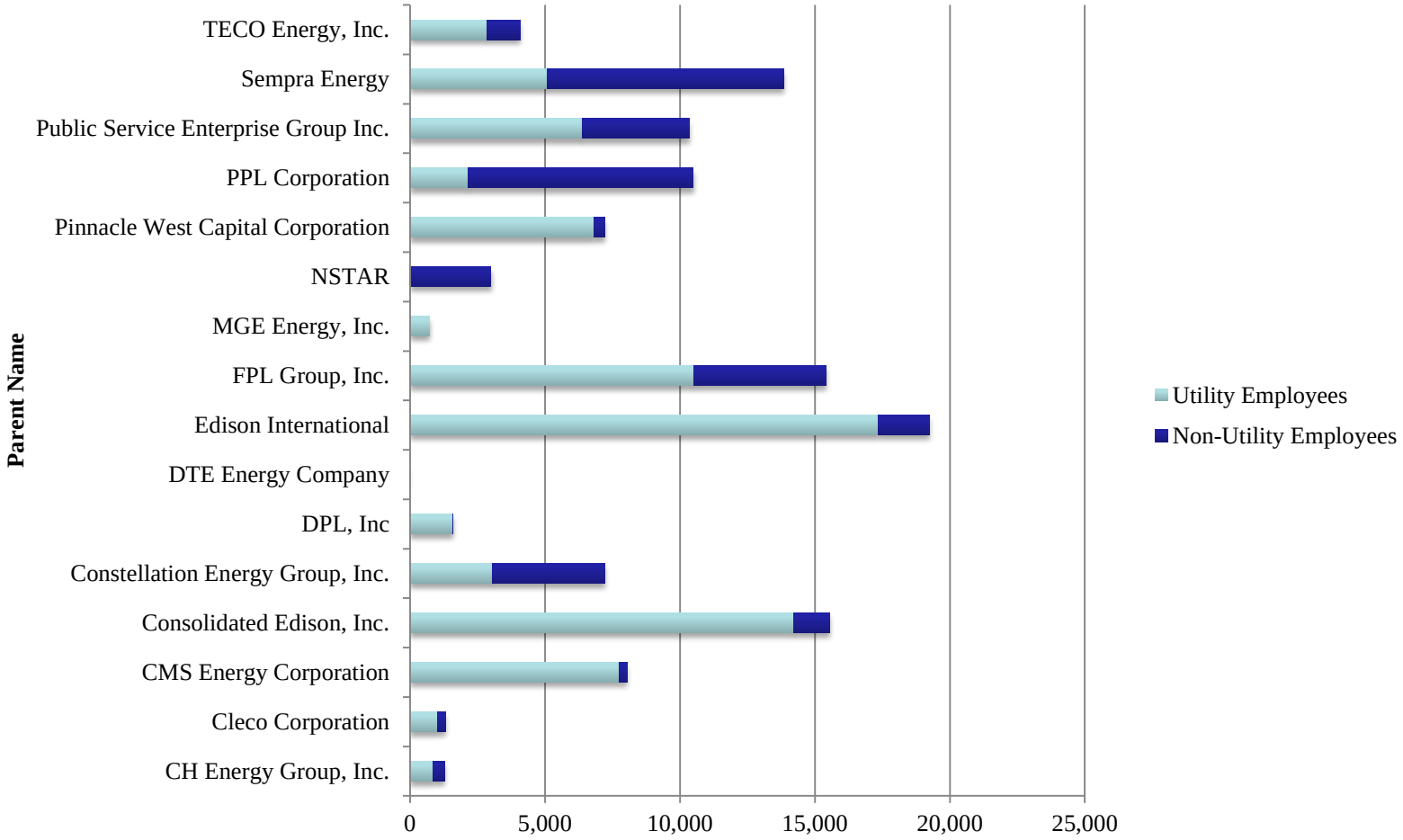
Observations:

About 3% of Pinnacle West's total assets are non-utility assets, which places the company in the lowest quartile in terms of non-utility assets, and far below the panel average and median.

PPL Corporation and Constellation Energy Group, Inc. own high value base-load generating plants, accounting for the high ranked positions on the panel.

Funds Paid among Affiliates

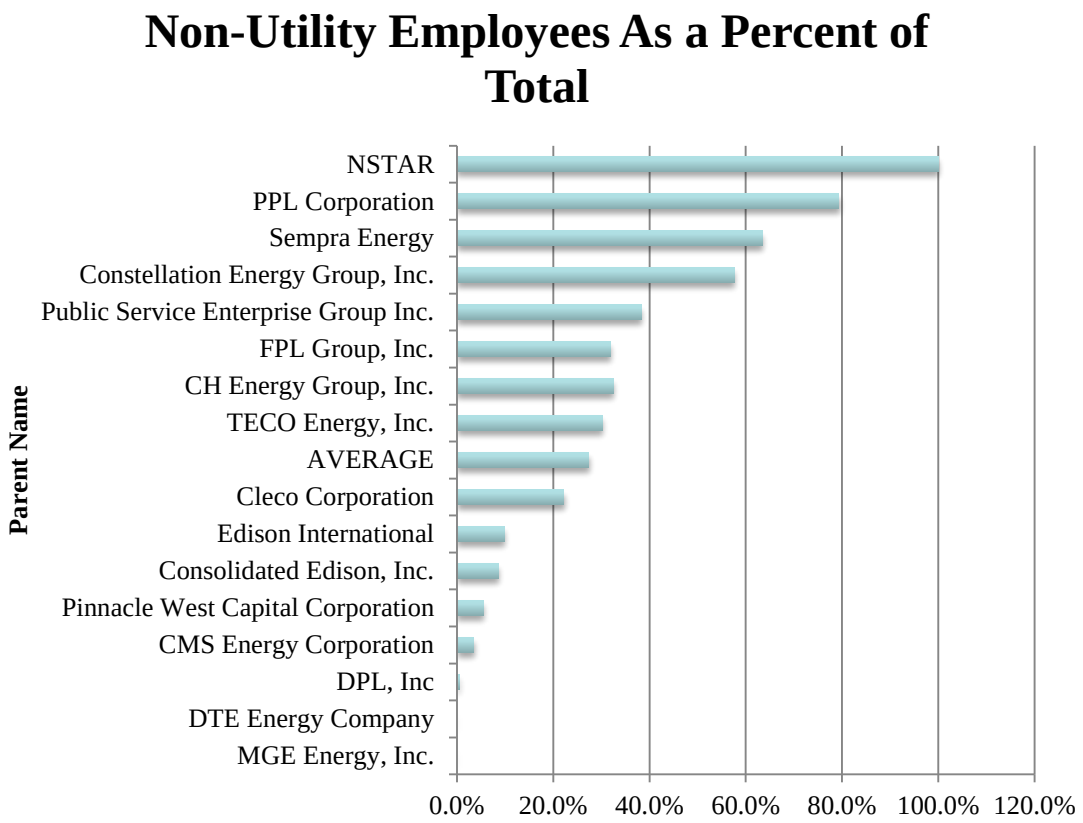
Comparison of Utility and Non-Utility Employees



Notes:

NSTAR – All employees work for the service company affiliate and are allocated to the other affiliates.
DTE Energy Company – Gas employee data are not reported.
MGE Energy, Inc. – Non-utility employee data are not reported.

Funds Paid among Affiliates



Parent Company	Non-Utility Employees As a Percent of Total
MGE Energy, Inc.	0.0%
DTE Energy Company	0.0%
DPL, Inc	0.4%
CMS Energy Corporation	3.5%
Pinnacle West Capital Corporation	5.6%
Consolidated Edison, Inc.	8.6%
Edison International	9.9%
Cleco Corporation	22.2%
AVERAGE	27.4%
TECO Energy, Inc.	30.2%
CH Energy Group, Inc.	32.4%
FPL Group, Inc.	31.8%
Public Service Enterprise Group Inc.	38.4%
Constellation Energy Group, Inc.	57.6%
Sempra Energy	63.4%
PPL Corporation	79.3%
NSTAR	100.0%

Observations:

About 6% of Pinnacle West's total employees are non-utility employees, which places the company at the low end of the range of the panel members, well below the panel average and median, and at a level best matching the members in the lowest quartile in terms of non-utility employees.

All of NSTAR's employees work for the service company affiliate and are allocated to the other affiliates.

Notes: DTE Energy Company – Gas employee data are not reported.
MGE Energy, Inc. – Non-utility employee data are not reported.

Form 60 Service Company Costs

- The FERC Form No. 60: ***Annual Report of Centralized Service Companies***, reports utility service company costs
  - It must be filed by every centralized service company of a holding company system, excepting those exempted or granted a waiver by the FERC
  - It replaces reporting to the SEC with reporting to the FERC following the 2005 changes to the Public Utility Holding Company Act (PUHCA)
- Approximately 35 service companies file (some holding companies produce multiple filings because they have multiple service companies)
- Pinnacle West/APS are not required to and do not file Form No. 60
- The companies that do file are not analogous to Pinnacle West/APS, which do not use a service company and do not have multiple utility operations in multiple jurisdictions
- Nevertheless, a brief review of the data shows the magnitudes of costs experienced by holding company service companies who are required to file
- The data put into perspective the nature and magnitude of payments among APS affiliates
- The following slide shows that the average 2009 annual amount billed by a service company is about $478 million dollars

Form 60 Service Company Costs for 2009

Form 60 Filer	Total $Amount Billed
Allegheny Energy Service Corporation	607,369,277
Alliant Energy Corporate Services, Inc.	277,695,495
Ameren Services Company	371,675,632
American Electric Power Service Corporation	1,064,810,391
Black Hills Service Company, LLC	97,009,869
Black Hills Utility Holdings, Inc.	70,699,146
CenterPoint Energy Service Company, LLC	352,848,560
Dominion Resources Services, Inc.	793,107,707
Duke Energy Business Services, LLC	1,945,761,665
E. ON US Services Inc.	294,976,508
Entergy Enterprises, Inc.	159,791,190
Entergy Nuclear Operations, Inc.	597,390,331
Entergy Operations, Inc.	378,540,932
Entergy Services, Inc.	933,447,564
Exelon Business Services Company	756,016,735
FirstEnergy Service Company	493,734,166
Iberdrola USA Management Corporation	67,819,595
Integrys Business Support, LLC	393,609,521
National Grid Corporate Services LLC	857,199,576
National Grid Engineering & Survey, Inc.	136,507,080
National Grid USA Service Company Inc.	758,563,883
National Grid Utility Services LLC	41,729,395
NiSource Corporate Services Company, Inc.	377,469,976
NiSource Gas Transmission and Storage Co.	33,362,271
Northeast Utilities Service Company	377,394,625
PHI Service Company	484,214,539
PNM Resources Inc.	125,359,702
Progress Energy Service Company, LLC	319,502,181
SCANA Services, Inc.	369,373,917
Southern Company Services, Inc.	1,278,634,038
Southern Nuclear Operating Company, Inc.	584,007,881
Unitil Service Corporation	31,883,290
Utility Shared Services Corporation	77,871,363
Xcel Energy Services Inc.	755,422,116
AVERAGE	478,376,474

Source: Annual Report of Centralized Service Companies, FERC Form 60, Schedule XVII – Analysis of Billing – Associate Companies, page 307

Note: Great Plains Energy Services Incorporated filed, but the page was left blank.

Summary

- Among the population of utility holding companies, the Pinnacle West/APS profile would suggest a comparatively lower general risk of cross subsidization
  - There are no other utility operations or jurisdictions to create a risk of misallocation of costs among utility operations
  - Pinnacle West has comparatively low levels of non-utility operations and has been phasing them down; therefore, there is comparatively low risk of misallocation of costs between utility and non-utility operations
- There are no 10-K reported principal affiliate goods/services interchanges involving APS.
- Even if there were, assessing the propriety of any interchanges and their costs would not be particularly informed by benchmarking
- There may be risk of cross-subsidy associated with common (if any) employee/labor misallocation, for example, but that level of detail is not available from public reports
  - A direct examination of the nature, extent, and pricing of any interchanges would be required to verify their propriety and benefit for utility customers; i.e., to rule out cross-subsidization risk