

AEP Coal Generation Benchmarking Analysis 2010 Update

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Generation Business Planning
September 29, 2010

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October 29, 2010

Introduction - Peer Groups

- Units were divided into two primary Peer Groups:
 - Supercritical coal units greater than 400 MW
 - Subcritical coal units greater than 350 MW (to exclude AEP's disposition units)
 - Further subdivided peer groups into scrubbed (prior to 01/01/2008) and unscrubbed

Supercritical Coal Units (> 400 MW)

	AEP*	Peers
Count	18 Units	77 Units
NMC	15,965 MW	55,900 MW

* - Excludes [REDACTED]

Subcritical Coal Units (> 350 MW)

	AEP	Peers
Count	8 Units	117 Units
NMC	4,247 MW	66,000 MW

The peer groupings used in this report allow for a more meaningful analysis than in previous years when units were only grouped by MW rating

Introduction - Definitions

- **Total Spend** – In this report, “Total Spend” represents all operations and maintenance expenses, “routine” maintenance capital costs, and other plant support costs (e.g. central engineering). Total Spend does not include fuel costs or “new capital”, such as: new environmental equipment; new fuel flexibility projects; new fuel transportation projects; capacity increase projects; and new capacity.
- **Scrubbed Units** – For the purposes of this report, “scrubbed” units are those units that had an FGD system placed in service prior to January 1, 2008
 - This definition guarantees at least two years of scrubber cost information
 - For AEP, these units include [REDACTED] Mitchell 1&2, [REDACTED] and [REDACTED], [REDACTED] and [REDACTED] (subcritical)
 - 32 of the 77 supercritical peer units and 35 of the 117 subcritical peer units meet this definition

Supercritical Units



Supercritical Units – Key Takeaways

These key takeaways will be discussed in this report:

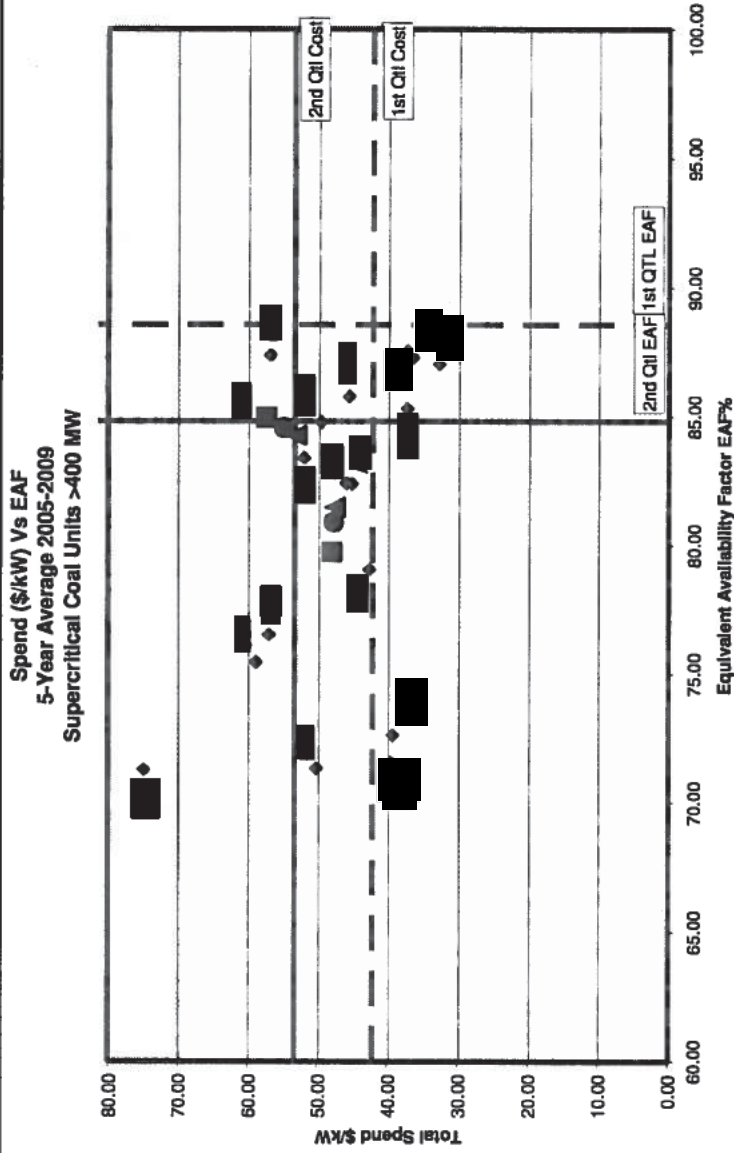
- While AEP Supercritical coal units have begun to [REDACTED] on overall [REDACTED] versus peer units, we are still [REDACTED] our peers and our performance continues to [REDACTED] versus the peers
- The erosion of AEP's [REDACTED] is driven by extended outages for FGD tie-in and balanced draft conversion. However, our peers were able to improve their 5-year EAF, while actually placing a higher percentage of FGDs into service in 2009
- AEP's Operations spend for supercritical units is [REDACTED] to that of our peers, but we are spending [REDACTED] on continuing Maintenance and Capital

Supercritical Units -- 5-Year Averages

- The table below groups the AEP supercritical units into quartiles based on Equivalent Availability Factor (EAF) performance
- These results will be analyzed relative to peer unit performance on the ensuing pages

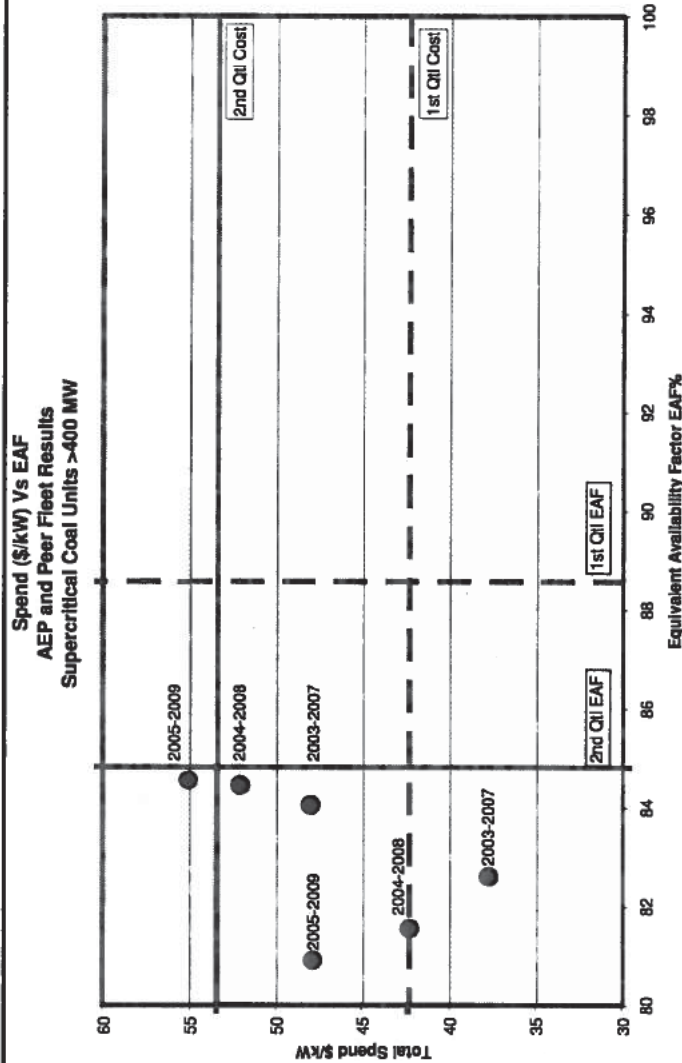
UNITNO	EAF	EFOR	POF	EUOF	Net Capacity Factor	NCF/EAF	Total Spend (\$/MWh)	Total Spend (\$/kW)	Fuel (\$/MWh)	Fuel (\$/mmBtu)	Net Heat Rate
ROCKPORT 1		3.65	6.44	5.92			5.20	37.37	18.63	1.94	
BIG SANDY UNIT 2		5.25	5.11	7.59			5.47	36.70	23.03	2.41	
ROCKPORT 2		2.22	9.53	3.44			4.59	32.90	19.56	2.02	
MITCHELL 2		10.21	16.40	10.96			6.99	39.50	17.01	1.78	
MITCHELL 1		13.55	14.31	14.01			7.46	39.67	18.11	1.83	

Supercritical Units – Spend vs. EAF Trend



- As a fleet, AEP is [REDACTED] than the peer group
- Big Sandy 2, Rockport 1&2 and [REDACTED] were AEP's top performing supercritical units on a Total Spend vs. EAF Performance basis over the last five years
- [REDACTED] continues to be an outlier on Total Spend, and [REDACTED] and Mitchell 1&2 lag the pack on EAF Performance

Supercritical Units – Spend vs. EAF Trend



- During the period from 2005-2009, AEP spent [redacted] per year less than peers on supercritical units
- This [redacted] equates to [redacted] per year for AEP's 15,965 MW supercritical fleet
- AEP's annual spend for supercritical units reached the peer average for the first time in 2009. AEP had major outage expenditures in 2009 for [redacted] and [redacted].
- During this same period, availability was [redacted] percentage points [redacted] than peers
- This difference equates to more than [redacted] of available generation per year for AEP's supercritical fleet

AEP continues to [redacted] on its supercritical coal fleet versus our peers, and our unit availability continues to [redacted] direction

Supercritical Units – Performance Factors

Supercritical Coal Units (>400 MW) Comparison with Navigant Units 2005-2009 Quartiles

	Best	1st Quartile	2nd Quartile	Median	3rd Quartile	4th Quartile	Worst
Equivalent Availability Factor (EAF)	83.04	85.57	84.91	84.91	81.83	81.83	68.53
Planned Outage Factor (POF)	0.01	4.85	6.73	6.73	8.41	8.41	22.00
Equivalent Unplanned Outage Factor (EUIOF)	1.60	5.52	7.83	7.83	9.63	9.63	22.47
Net Heat Ratio (NHR)	9,015	9,621	9,746	9,746	10,004	10,004	11,420
O&M + Capital (\$/MWh)	\$15.53	\$42.36	\$53.47	\$53.47	\$65.00	\$65.00	\$123.00
O&M + Capital (\$/MWh)	\$2.08	\$4.65	\$8.06	\$8.06	\$9.82	\$9.82	\$31.27
Fuel (\$/MWh)	\$10.33	\$46.85	\$18.02	\$18.02	\$20.03	\$20.03	\$42.74
Fuel (\$/MMBtu)	\$1.11	\$1.62	\$1.97	\$1.97	\$2.29	\$2.29	\$3.04

- AEP's 5-year EAF has moved from [redacted] last year into the fourth quartile at [redacted]
- This reduction in EAF is primarily driven by the extended outages required for FGD tie-in and balanced draft conversion
- Peer unit 5-year EAF improved slightly from [redacted] to [redacted]%, in spite of having a greater percentage of units (1.4 out of 77) than AEP with FGDs going into service in 2009
- It is believed that many peer units already had balanced draft designs and were therefore able to have shorter outage times than AEP

Peers were able to improve 5-year EAF on supercritical coal units, and at the same time place a greater percentage of unit FGD systems on line in 2009 versus AEP

Supercritical Units – Quartile Summaries

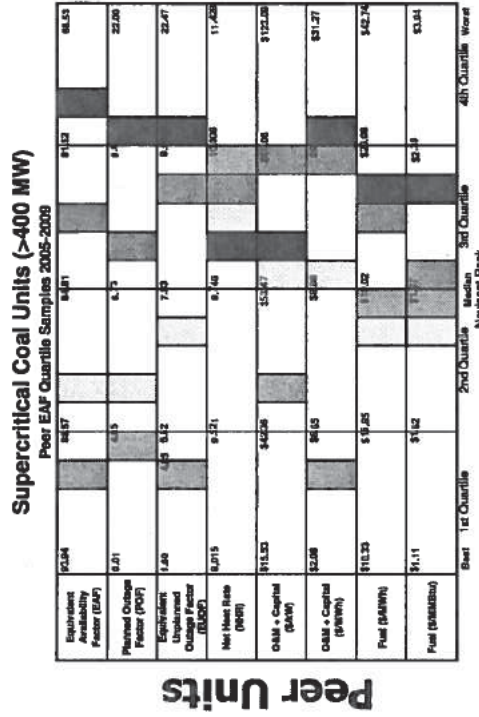
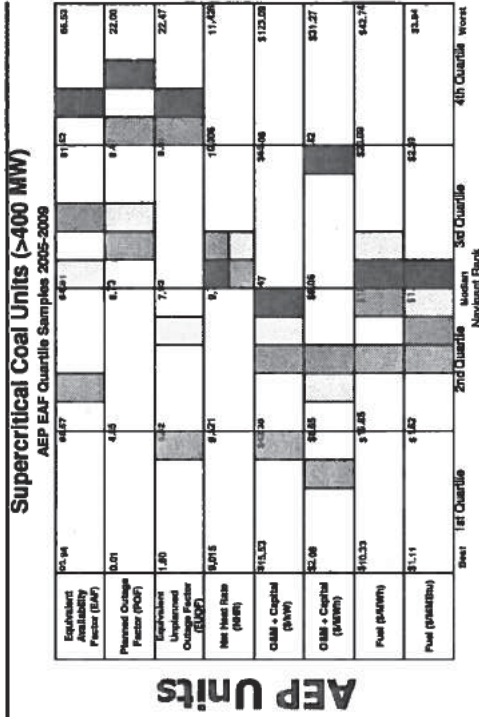
- The charts to the right separate the units into quartiles based on 5-year EAF, and then show how those same units performed on each metric

- i.e. the green block represents the same set of units throughout the chart, as do the yellow, orange and red blocks

AEP Units:

- 1st Quartile (Green): RK1, BS2, RK2,
- 2nd Quartile (Yellow):
- 3rd Quartile (Orange):
- 4th Quartile (Red): ML2, ML1,

- These charts show that the top two EAF-based quartiles of peer units benefit from very low POF and EUOF, while the corresponding quartiles of AEP units have a POF



With the exception of Planned Outage Factor, AEP quartiled units behave [redacted] to peer quartiled units

Supercritical Units – Cost Summaries

The tables below break down the 5-year average spends for scrubbed and unscrubbed units into Operations and continuing Maintenance & Capital components

	\$/kW			\$/MWh		
	Peers	AEP	Peer-AEP	Peers	AEP	Peer-AEP
All Units						
Operations						
Maint. & Cap.						
Total Spend						

	\$/kW			\$/MWh		
	Peers	AEP	Peer-AEP	Peers	AEP	Peer-AEP
Scrubbed Units						
Operations						
Maint. & Cap.						
Total Spend						

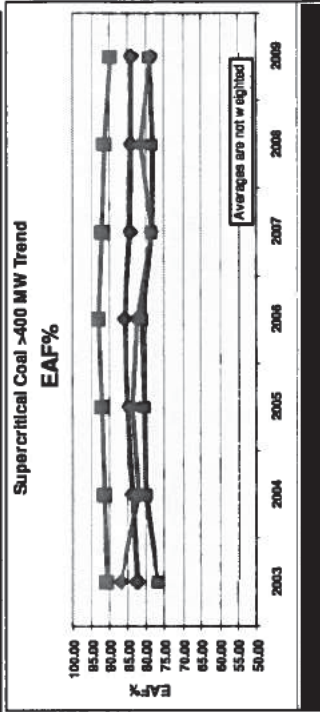
	\$/kW			\$/MWh		
	Peers	AEP	Peer-AEP	Peers	AEP	Peer-AEP
Unscrubbed Units						
Operations						
Maint. & Cap.						
Total Spend						

- AEP is in alignment overall with the peers on Operations spend
 - However, AEP's Operations Cost for [redacted] is a concern, as it is nearly [redacted] than Operations Costs for [redacted] and Mitchell, and it is even [redacted] than the [redacted] unit that was hampered by significant unavailability
- Of particular interest are the Maintenance & Capital spends for scrubbed units (circled in green)
 - AEP is spending [redacted] peers on a \$/kW basis, and [redacted] than AEP spends on unscrubbed units (Note: [redacted] is considered unscrubbed by our definition, and the precipitator work done in 2009 drives this latter result)
 - AEP's capital budget constraints have limited our ability to accomplish continuing maintenance and capital work in addition to the Environmental Program

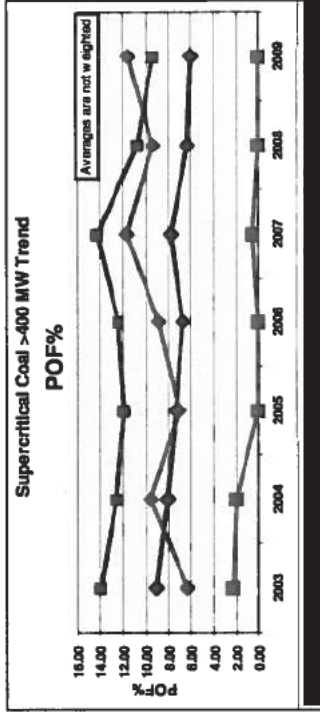
AEP's costs for Operations are [redacted] to our peers, but we are spending significantly [redacted] on continuing Maintenance and Capital [redacted]

Supercritical Units – Performance Trends

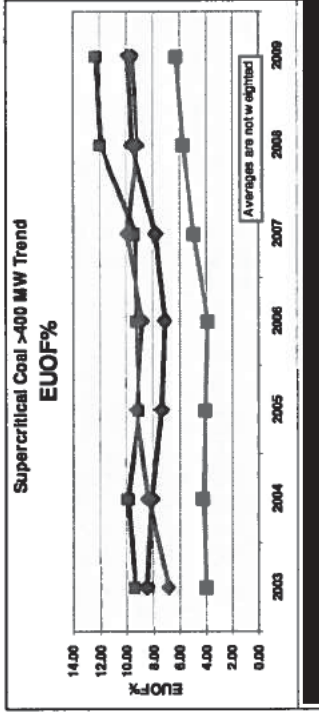
- The charts to the right show how AEP supercritical unit single-year EAF, POF and EUOF have trended versus peer units
 - Note that peer unit samples that make up the quartile breakpoints from year to year may represent different units.



- Peer unit EAF has been relatively flat since 2003
 - The decreasing POF trend is counter-balanced by an increasing EUOF trend
 - Peer unit POF is decreasing despite the large number of FGD installations they have completed



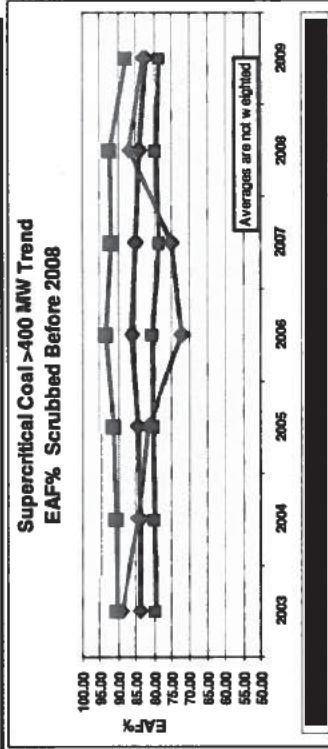
- AEP has an increasing EUOF trend similar to the peers, but AEP POF is also increasing, which has driven the EAF lower over time
 - In addition to FGD tie-in outages, we are beginning to see the effects of corrosion and other material problems in the recent generation of FGD equipment
 - AEP's recent EUOF performance has been highly driven by [redacted] and [redacted] which were in various stages of FGD implementation
 - The increased EUOF at [redacted] could be blamed on maintenance work that was deferred awaiting the tie-in outages
 - [redacted] had significant generator problems shortly after it returned from its tie-in outage



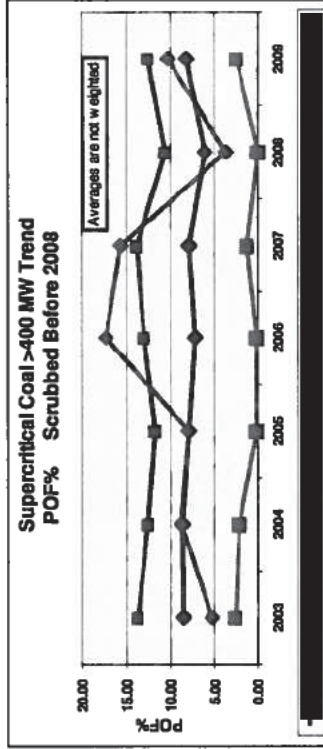
AEP's [redacted] is largely driven by an [redacted]. Our peers have held EAF flat by reducing POF while at the same time installing a greater percentage of FGD systems

Supercritical Units – Scrubbed Units

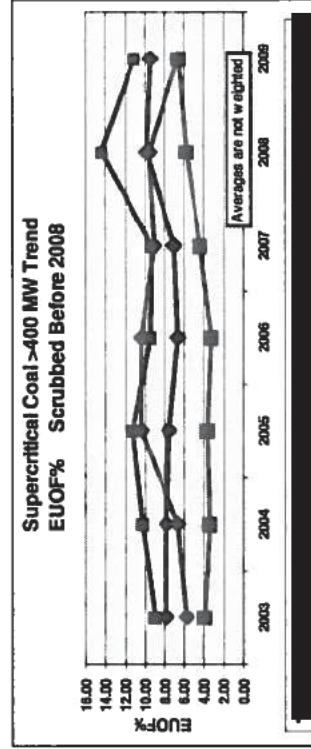
- Peer unit performance for supercritical scrubbed units is consistent with the performance previously stated for the total set of supercritical units
 - The EAF trendlines are essentially flat
 - POF has a slightly decreasing trend
 - EUOF has a slightly increasing trend



- The [redacted] for AEP units in 2006-2007 is driven by the most recent scrubber installations and lead to a corresponding dip in EAF



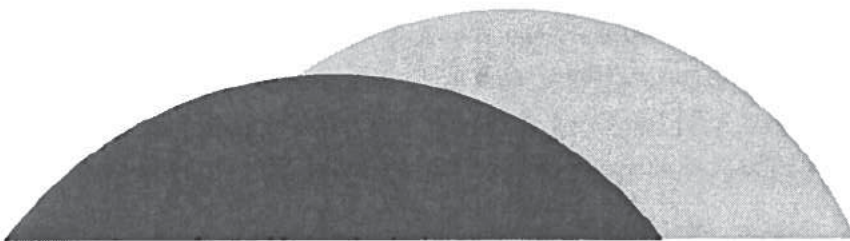
- The high AEP POF in 2009 is driven by the [redacted] JBR repairs and the ductwork modifications on Mitchell 2
 - AEP units will continue to have downward pressure on [redacted] as we address [redacted] that are surfacing with the new scrubber designs



- AEP supercritical scrubbed units are showing improvement in EUOF
 - [redacted] have reached the top quartile for 2009, and the Mitchell units are very close to the top quartile
 - Only [redacted] lags in this area

AEP's scrubbed supercritical units are showing a [redacted] since 2006, but the emerging FGD [redacted] will continue to put [redacted]

Subcritical Units



Subcritical Units – Key Takeaways

These key takeaways will be discussed in this section of the report:

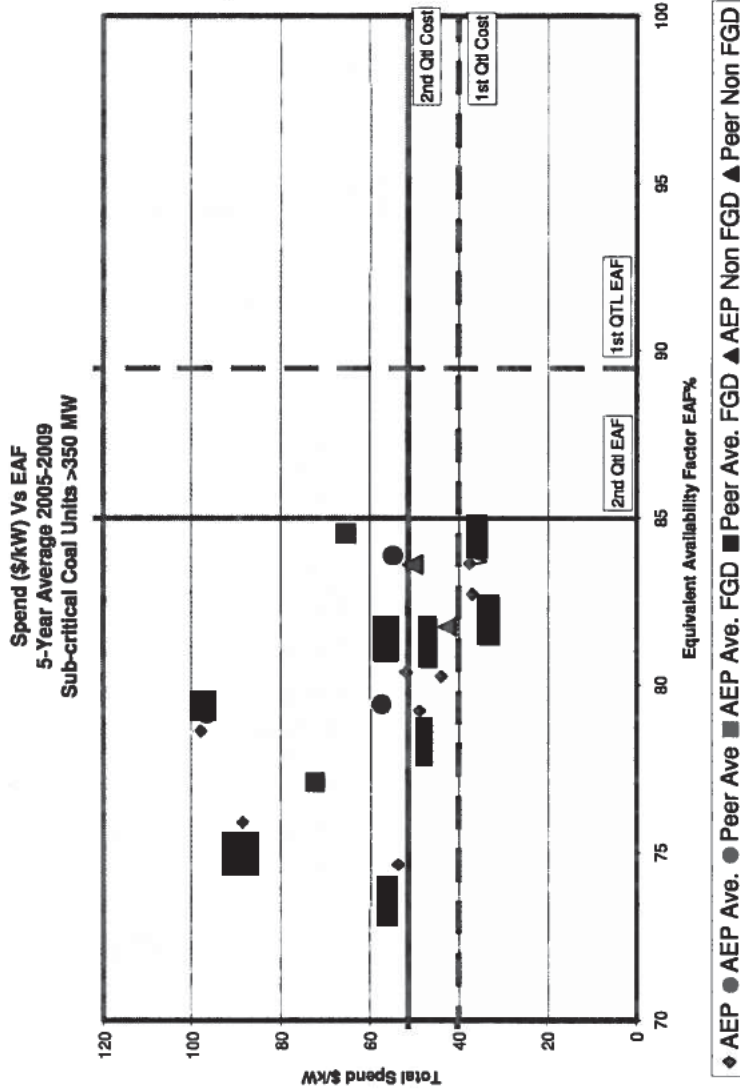
- Unlike with the Supercritical coal units, AEP is spending well in excess of our peers on subcritical units
 - This overspend is driven by Operations costs on the four scrubbed units, most notably [REDACTED]
 - Similar to the supercritical units, AEP's subcritical unit performance has slipped versus the peers
- Our peers were able to trend their average POF slightly downward, while at the same time adding scrubbers to 18% of their units
 - Conversely, with zero new FGD installations, AEP subcritical unit POF has been in the fourth quartile versus peers four out of the last five years

Subcritical Units – 5-Year Averages

- The table below groups the AEP subcritical units into quartiles based on Equivalent Availability Factor (EAF) performance
- These results will be analyzed relative to peer unit performance on the ensuing pages

UNITNO	EAF	EFOR	POF	EUOF	Net Capacity Factor	NCF/EAF	Total Spend (\$/MWh)	Total Spend (\$/kW)	Fuel (\$/MWh)	Fuel (\$/mmBtu)	Net Heat Rate
[Redacted]											

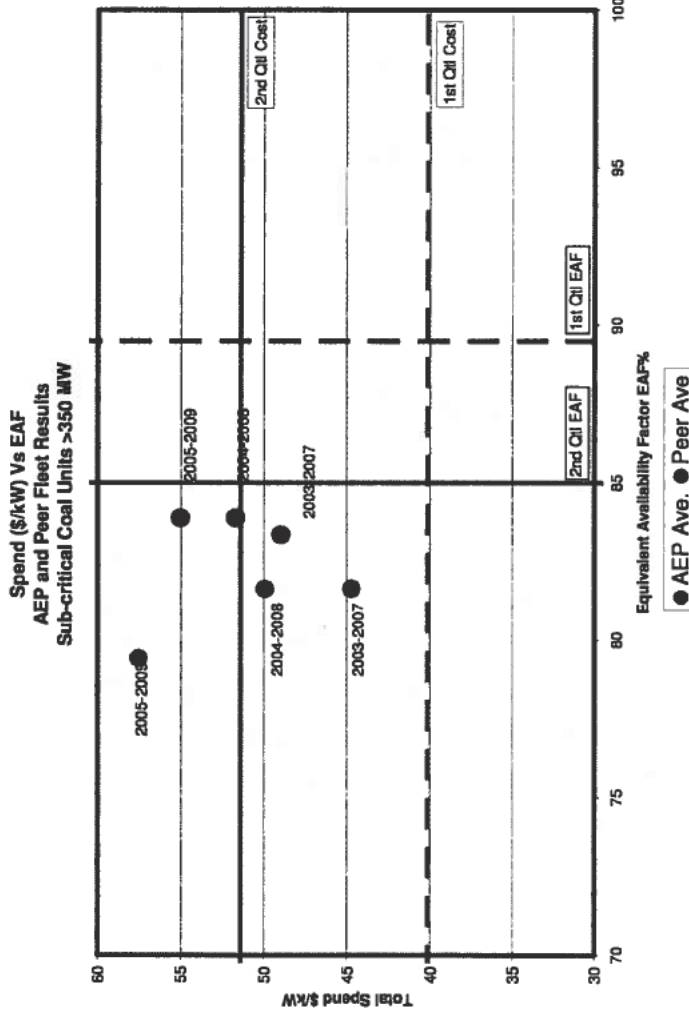
Subcritical Units – Spend vs. EAF Trend



- The extended outages for [redacted] (2009) and [redacted] (2008) have driven AEP's subcritical unit 5-year Total Spend above the peer average
 - Only 5 of the 117 peer units (4.2%) had annual \$/kW spends as high as [redacted] since 2008
 - All but one of AEP's subcritical units have a lower 5-year EAF than the peer average

The Spend at [redacted] have a significant effect on the Total Spend for the AEP subcritical fleet relative to the peers

Subcritical Units – Spend vs. EAF Trend



- During the period from 2005-2009, AEP spent [redacted] per year more than peers on subcritical units
 - This overspend equates to [redacted] per year for AEP's 4,247 MW subcritical fleet
 - AEP's spend includes major outage expenditures in 2008 for [redacted] and 2009 for [redacted]
- During this same period, availability was [redacted] percentage points lower than peers
 - This difference equates to more than [redacted] of available generation per year for AEP's subcritical fleet

AEP is now [redacted] on its subcritical coal fleet versus our peers, but our unit availability continues to [redacted] versus the peers

Subcritical Units – Performance Factors

Sub-critical Coal Units (>350 MW)
Comparison with Navigant Units 2005-2009 Quartiles

	Best	1st Quartile	2nd Quartile	Median	3rd Quartile	4th Quartile	Worst
	-2005-2009 AEP Average Unweighted			-2005-2009 Sample Ave Unweighted			
Equivalent Availability Factor (EAF)	91.36	89.40	84.08	78.57	70.42	63.41	60.41
Planned Outage Factor (POF)	0.84	4.41	6.63	8.03	10.17	14.27	20.02
Equivalent Unplanned Outage Factor (EUOF)	0.81	4.82	7.14	11.15	14.81	20.34	28.34
Heat Rate Ratio (HRR)	9176	10,008	10,267	10,591	10,915	11,314	11,714
CAIM + Capital (\$/MWh)	\$23.64	\$40.33	\$51.43	\$61.40	\$71.40	\$81.40	\$101.40
CAIM + Capital (\$/MWh)	\$2.85	\$5.89	\$7.23	\$8.43	\$10.15	\$11.35	\$13.35
Fuel (\$/MWh)	\$0.61	\$13.10	\$16.53	18.60	\$22.50	\$26.60	\$30.60
Fuel (\$/MWh)	\$0.77	\$1.27	\$1.61	1.81	\$2.23	\$2.73	\$3.73

- The dominant drivers in AEP's EAF performance of its subcritical coal fleet are the extended planned outages at [redacted] in 2008, and at [redacted], [redacted] and [redacted] in 2009
- All other metrics for AEP units are near the peer group average performance

AEP's subcritical coal fleet [redacted] has [redacted] well into the [redacted] versus the peers, and [redacted] all other measures fall in the [redacted]

Subcritical Units – Cost Summaries

The tables below break down the 5-year average spends for scrubbed and unscrubbed units into Operations and continuing Maintenance & Capital components:

	\$/kW			\$/MWh		
	Peers	AEP	Peer-AEP	Peers	AEP	Peer-AEP
All Units						
Operations						
Maint. & Cap.						
Total Spend						

	\$/kW			\$/MWh		
	Peers	AEP	Peer-AEP	Peers	AEP	Peer-AEP
Scrubbed Units						
Operations						
Maint. & Cap.						
Total Spend						

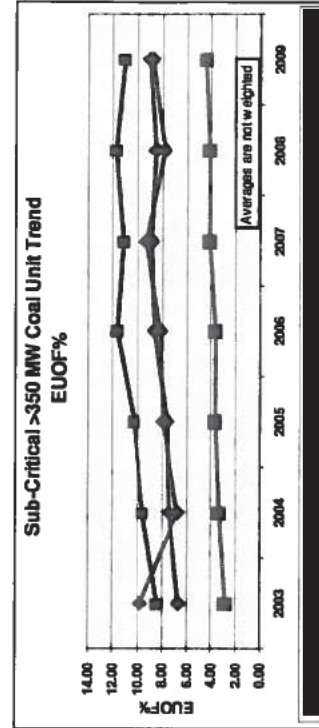
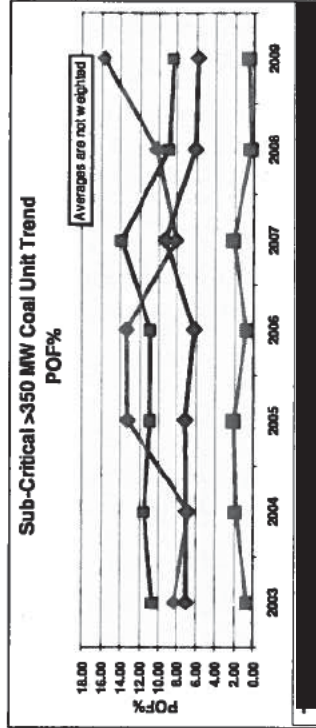
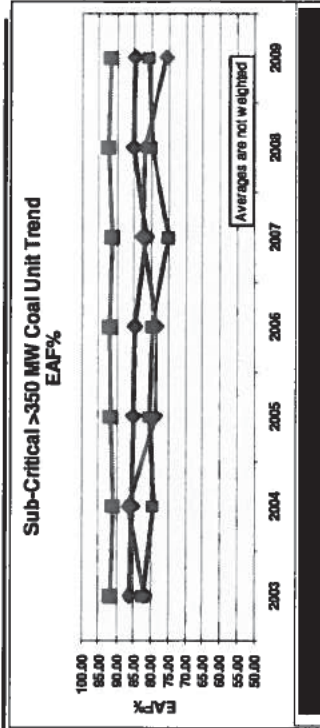
	\$/kW			\$/MWh		
	Peers	AEP	Peer-AEP	Peers	AEP	Peer-AEP
Unscrubbed Units						
Operations						
Maint. & Cap.						
Total Spend						

- In stark contrast with the supercritical units, AEP's total spend on its scrubbed subcritical units [redacted] the peers as well as AEP's unscrubbed units
 - The driver is in the operations cost (circled in green), more specifically AEP's costs for NOx allowances, lime and overhauls at [redacted]
- AEP is [redacted] the peers by [redacted] on Maintenance and Capital of unscrubbed units

AEP's Total Spend on its scrubbed subcritical units [redacted] the peers as well as AEP's unscrubbed units

Subcritical Units – Performance Trends

- The charts to the right show how AEP subcritical unit single-year EAF, POF and EUOF have trended versus peer units
- Peer unit EAF has been relatively flat at 85% since 2003
 - As with the supercritical peer units, the slightly decreasing POF trend is counter-balanced by an increasing EUOF trend
 - 21 of the 117 peer units installed FGD systems after 2005 (AEP subcritical units had zero FGD installations during this period), 15 of those coming in the last two years when the peer average POF was the lowest
- AEP's EUOF trend tightly lines up with the peer average, but AEP POF has been in the fourth quartile four out of the last five years
 - The dominant drivers are the extended planned outages at [redacted] in 2005, [redacted] in 2006, [redacted] in 2008, and at [redacted] and [redacted] in 2009
 - Last year, we attributed AEP's high subcritical POF to the fact that many units have hot-side precipitators. However, further analysis has shown that these same units have a high POF even when compared to peer units with hot side precipitators



Six of AEP's eight subcritical units have had [redacted] driven [redacted] if [redacted] in the last five years, a fact which has [redacted]

AEP Coal Generation Benchmarking Analysis 2011 Update

Prepared by: Generation Planning and Performance
Tom Stain

Presented to: Mark McCullough
2011

Introduction - Peer Groups

- Units were divided into two primary Peer Groups:
 - Supercritical coal units greater than 400 MW
 - Subcritical coal units greater than 350 MW (to exclude AEP's disposition units)
- Report primarily reviews Unit and Fleet Spend for Operations and Maintenance, with a short review of SCR, FGD and Allowance expenditures at the end

**Supercritical Coal Units
(> 400 MW)**

	AEP*	Peers**
Count	18 Units	70 Units
NMC	15,965 MW	51,500 MW

* - Excludes [REDACTED]

** - Excluded units with less than the full 5 yrs of data, this eliminates 7 supercritical units with 4,400 MW & 25 Subcrit units with 13,400 MW from the prior report.

**Subcritical Coal Units
(> 350 MW)**

	AEP	Peers**
Count	8 Units	92 Units
NMC	4,247 MW	52,600 MW

The separation of the environmental spend allows for a more straight forward review of the non-environmental spend for maintenance and operations

Introduction - Definitions

- **Total Spend** – In this report, “Total Spend” represents all operations and maintenance expenses, “routine” maintenance capital costs, and other plant support costs (e.g. central engineering). Total Spend does not include fuel costs or “new capital”, such as: new environmental equipment; new fuel flexibility projects; new fuel transportation projects; capacity increase projects; and new capacity.
- **Spend for FGDs, SCRs is handled separately** – For the purposes of this report, the FGD/SCR units are those peer units that had a system placed in service prior to January 1, 2009 (to show at least two years of operating cost)
 - Peer groups:
 - Supercritical units - 11 peer units had FGDs only, 26 units had both FGD & SCR and 11 had SCRs only
 - Subcritical units – 23 peer units had FGDs only, 19 units had both FGD & SCR and 16 had SCRs only

Supercritical Units – Key Takeaways

These key takeaways will be discussed in this report:

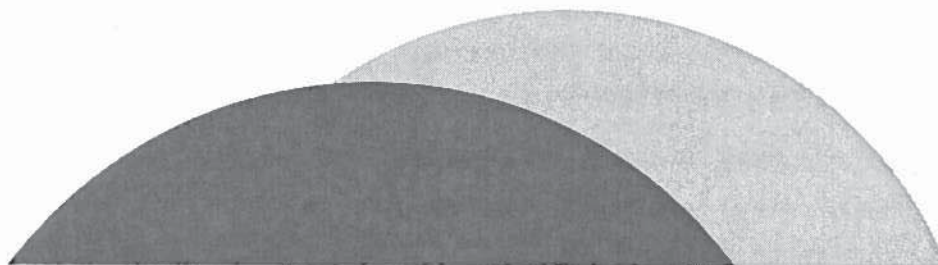
- For the current 5 year period (2006 – 2010) AEP's Supercritical coal units continued to [REDACTED] the peers on maintenance and our performance [REDACTED] versus the peers
- The [REDACTED] of AEP's 5-year EAF is driven both by extended outages for FGD tie-in/balanced draft conversion and Forced Outages
- AEP's Operations spend for supercritical units is [REDACTED] that of our peers
- The peer units spending the least on maintenance on a five year basis (1st quartile or Q1) were generally also in the lowest spending quartiles (Q1 & Q2) in 4 out of the five years with one year of increased spend. These same units also performed well in availability with ¾ of them performing in Q1 or Q2 (best two quartiles) for EAF, EFOR & EUOF. This may indicate that, for select units, increasing the spend at the next opportunity and addressing all expect liabilities and reducing the funding in the following years could yield positive value.

Subcritical Units – Key Takeaways

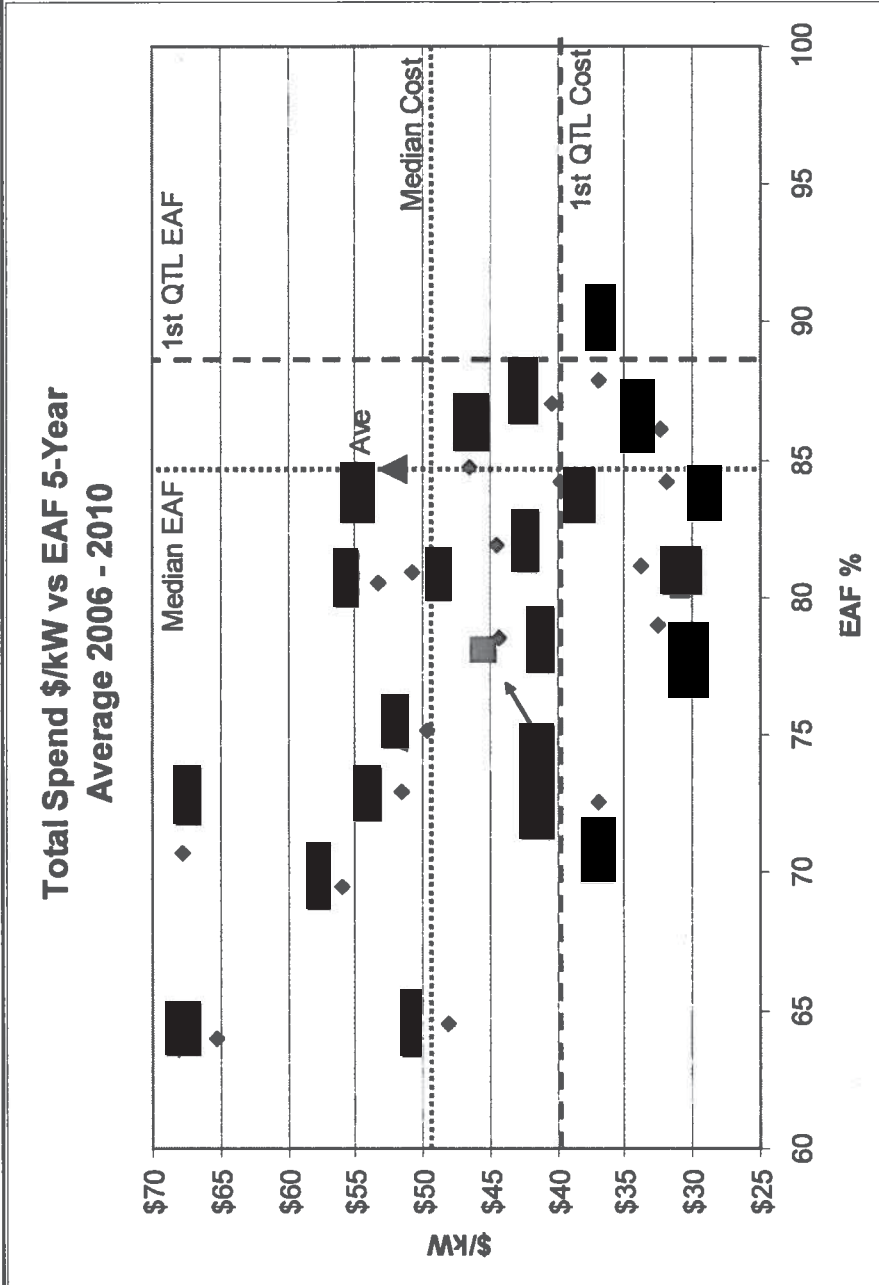
These key takeaways will be discussed in this report:

- AEP, excluding [REDACTED], is spending [REDACTED] than our peers on the subcritical Maintenance and in Total
 - AEP's 5 year average spend, excluding [REDACTED], for Maintenance was [REDACTED] and Operations was [REDACTED]
 - The 5 year average spend at [REDACTED] was [REDACTED] than the peers for both Maintenance [REDACTED] and Operations [REDACTED]
- AEP has averaged [REDACTED] EAF which was driven by both [REDACTED] EFOR ([REDACTED] percentage points per year) and POF ([REDACTED] percentage points) than the peers

Supercritical Units



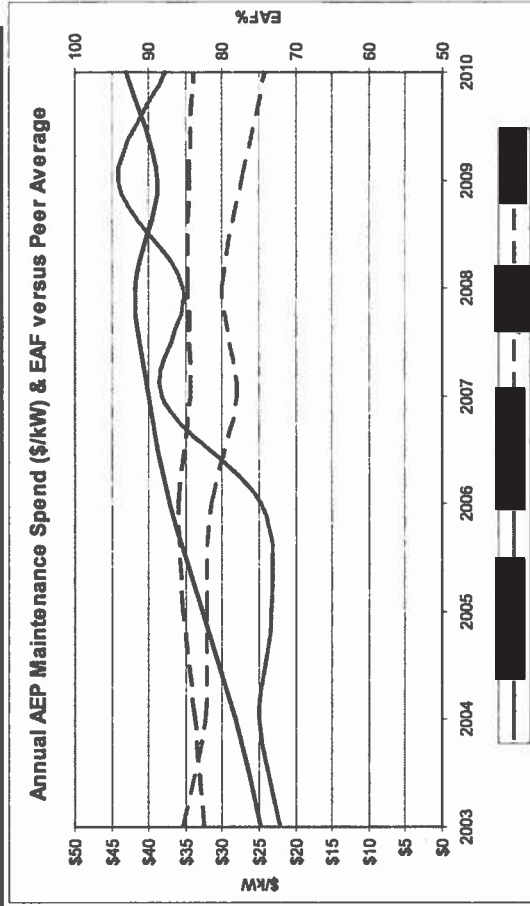
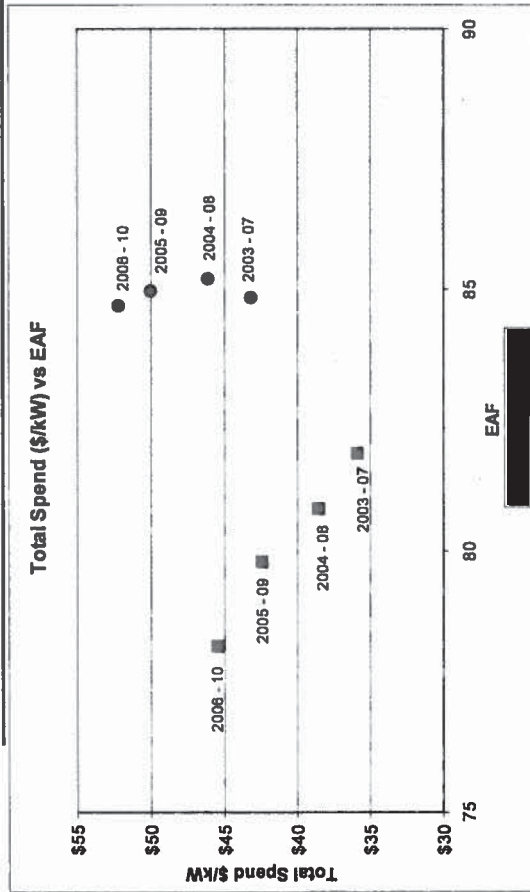
Supercritical Units – Spend vs. EAF Trend



As a fleet, AEP is [redacted] than the peer group

- Rockport 1, Big Sandy 2 and [redacted] were AEP's top performing supercritical units on a Total Spend vs. EAF Performance basis over the last five years
- [redacted] & [redacted] continue to be outliers on Total Spend, with [redacted], [redacted], and [redacted] lagging the fleet in EAF Performance

Average Spend vs. EAF Trend



- During the period from 2006-2010, AEP spent less per year than the peer average on a \$/kW basis
 - AEP spent [redacted] less in the most recent period (approximately [redacted] per year)
 - AEP also spent slightly [redacted] the peers on a \$/MWh basis (by [redacted])
- On an annual basis
 - AEP's annual Maintenance spend for supercritical units on a \$/kW basis has been [redacted] than the peer average except for 2009
 - Primary driver for the 2009 spend spike were major outage expenditures for [redacted] and [redacted]
- During the current 5 year period, availability was [redacted] percentage points [redacted] than peers and Net Capacity Factor was [redacted] percentage points [redacted]

AEP continues to [redacted] on its supercritical coal fleet versus our peers, and our unit availability [redacted]

Supercritical Units – Performance Factors

Supercritical Coal Units (>400 MW) Comparison with Navigant Units 2006-2010 Quartiles

	Best	1st Quartile	2nd Quartile	Median	3rd Quartile	Worst
Equivalent Availability Factor (EAF)	92.7	89.0	84.9	81.6	78.2	66.4
Planned Outage Factor (POF)	3.1	4.7	6.4	8.5	11.2	16.0
Equivalent Unplanned Outage Factor (EUOF)	2.0	5.7	7.9	10.4	13.1	21.1
Equivalent Forced Outage Rate (EFOR)	0.7	3.9	6.6	9.6	13.1	19.6
O&M + Capital (\$/kW) - ex FGD, SCR & Allowances	\$24.99	\$40.70	\$49.13	\$57.34	\$65.42	\$123.67
O&M + Capital (\$/MWh) - ex FGD, SCR & Allowances	\$4.04	\$6.02	\$7.48	\$9.04	\$10.80	\$13.07
Fuel (\$/MWh)	\$14.10	\$18.44	\$21.83	\$23.90	\$26.17	\$28.44

=2006-2010 AEP Avg. Unweighted
 =2008-2010 Sample Avg. Unweighted

AEP's 5-year EAF continues it's [redacted] moving from [redacted] for the period ending in 2008 to [redacted] in 2009 and [redacted] in 2010

- The [redacted] in EAF is driven by both POF and EFOR, including extended outages required for FGD tie-in and balanced draft conversion
- Peer unit 5-year EAF continues it's slight improvement progress moving to [redacted] from [redacted] in 2009 and [redacted] in 2008
- Note that AEP's worst performing unit ([redacted]) for EAF, EUOF and EFOR performed worst than any peer unit

Peers were able to [redacted] 5-year EUOF, both as an absolute [redacted]

Supercritical Units – Cost Summaries

- The table below breaks down the 5-year average spends into Operations and continuing Maintenance & Capital components excluding FGD, SCR and Allowance Costs
- AEP performed well overall in comparison to the peers on Operations spend
 - Most units performed in the first and second (lowest cost) quartiles (5 of 20 units fell into the 3rd quartile and none were in the 4th quartile)
 - The lowest cost unit was Rockport 2 at \$0.95/MWh and the highest cost unit was [REDACTED] at [REDACTED]
- On a \$/kW basis, AEP is spending approximately [REDACTED] less on Maintenance than the peer average which, coupled with the [REDACTED] EAF, EUOF, EFOR and NCF performance indicates that spending [REDACTED]
- Note – The total is the sum of Operations and Maintenance spend and not the same as the spend seen on slide 6

	\$/kW				\$/MWh			
	AEP Ave	Average	Median	Peer 1st Quartile	AEP	Average	Median	Peer 1st Quartile
All Units ex FGD, SCR & Allowance Costs	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Operations	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Maintenance	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Total	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Unit	EAF	EFOR	POF	EUOF	NCF
AEP Fleet Average	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Peer Median	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Peer Best Quartile	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

AEP's spends [REDACTED] our peers for both Operations and Maintenance, costs for Operations was in the 1st quartile compared to our peers, with Maintenance spending [REDACTED] less than the peer average in \$/kW (the [REDACTED] is due to the [REDACTED])

Supercritical Units – Performance Trends

These charts show how AEP supercritical unit single-year EAF, NCF, POF and EFOR have trended versus peer units

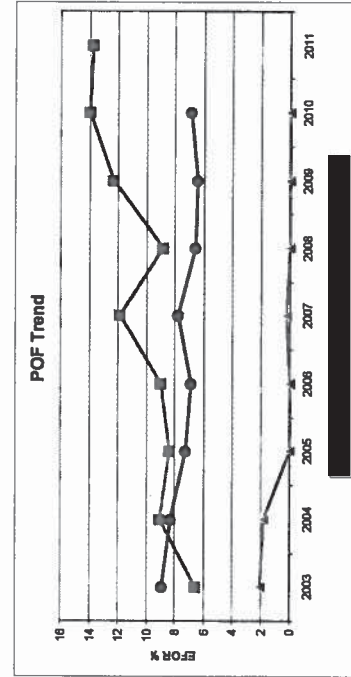
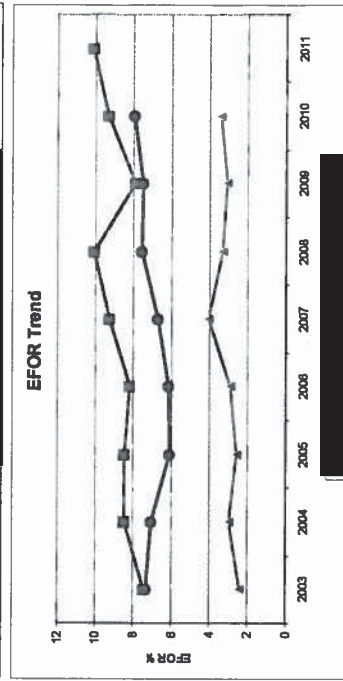
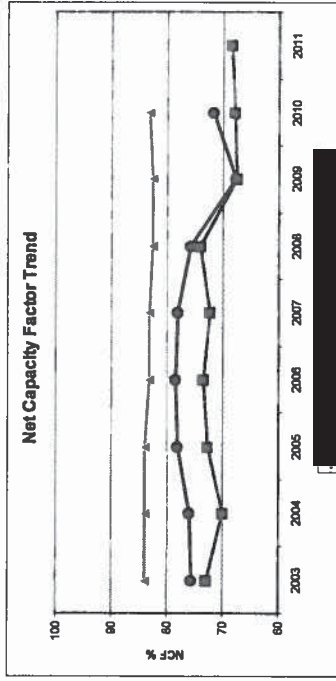
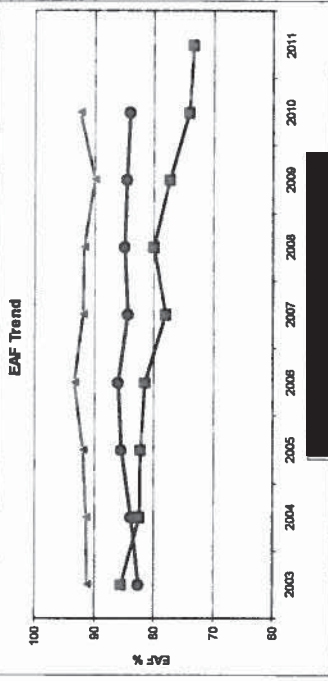
- Note that peer unit samples that make up the quartile breakpoints from year to year may represent different units.

- EAF for Peer units (both 1st Quartile and average EAF), has been relatively flat for the period. AEP's average EAF [redacted]

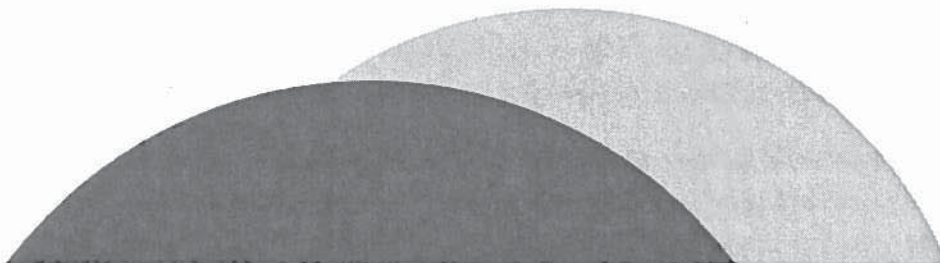
- NCF for the 1st Quartile units has been relatively flat over the period while the Peer average units show a drop below the average range in the last 2-3 years.

and shows [redacted] in the last two years

- The EFOR trend shows increases for all units, with the Peer average unit having a 4% higher EFOR than the 1st Quartile units and [redacted]



Subcritical Units

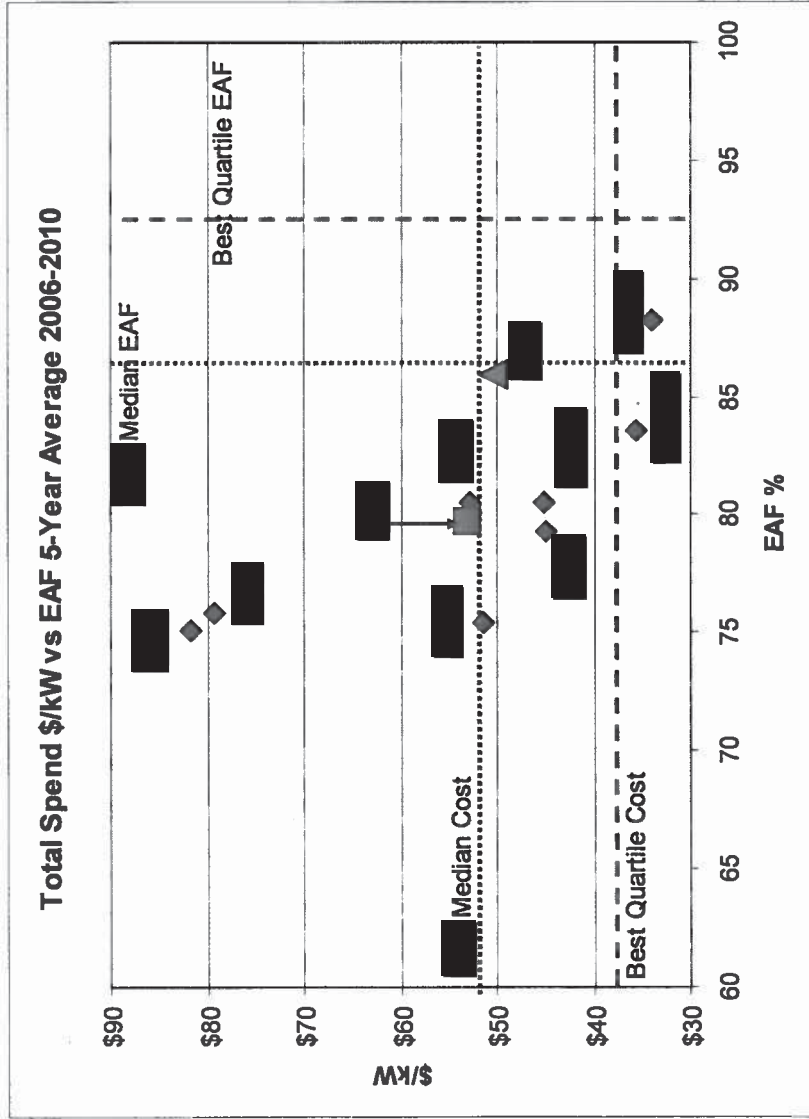


Subcritical Units -- 5-Year Averages

- The table below groups the AEP subcritical units into quartiles based on EFOR
- These results will be analyzed relative to peer unit performance on the ensuing pages

Unit	EAF	EFOR	POF	EUOF	NCF	Total Spend (\$/MWh)	Total Spend (\$/kW)	Fuel \$/MWh	Peer EFOR Quartile
									Q1
									Q2
									Q2
									Q4
									Q4
									Q4
									Q4
									Q4
AEP Fleet Average									
Peer Median									
Peer Best Quartile									

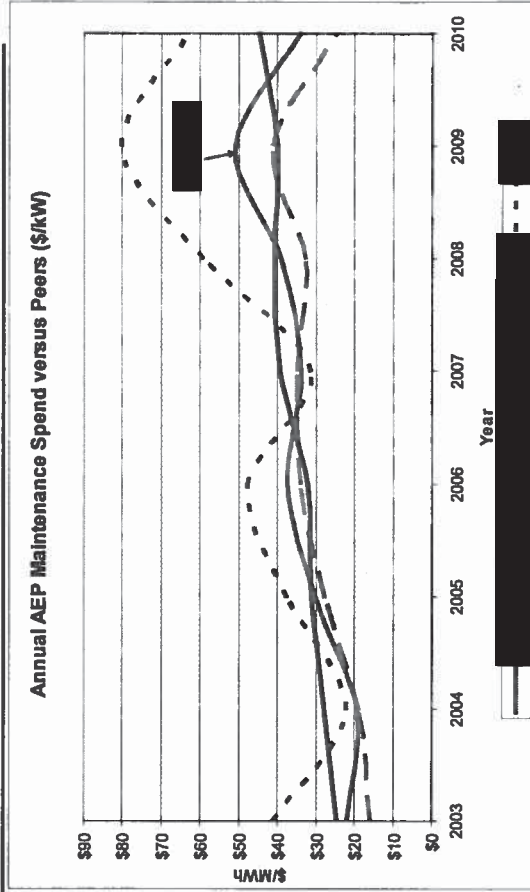
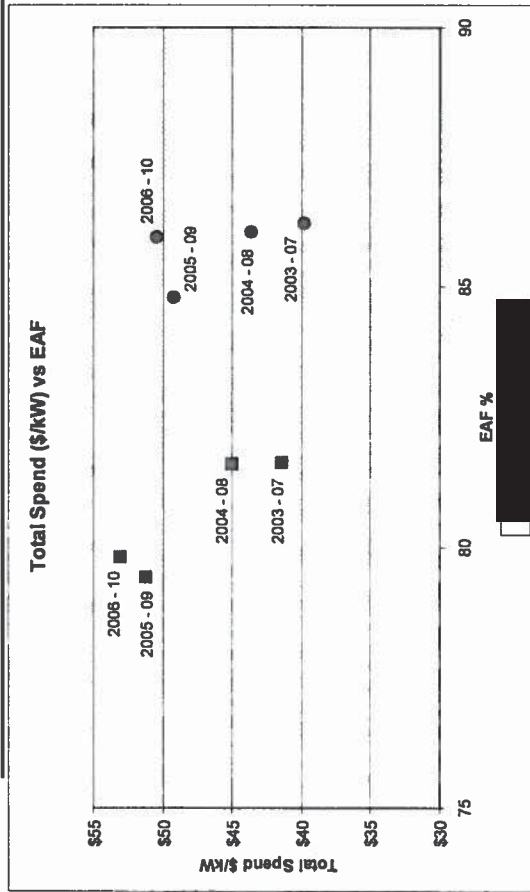
Subcritical Units – Spend vs. EAF Trend



- The extended outages for [REDACTED] (2009) and [REDACTED] (2008 & 2010) have driven AEP's subcritical unit 5-year Total Spend [REDACTED]
- Only [REDACTED] of the [REDACTED] units ([REDACTED]) had annual \$/kW spends higher than [REDACTED] for the period [REDACTED]
- [REDACTED] of AEP's subcritical units has [REDACTED]

The Spend at [REDACTED] Total Spend for the AEP [REDACTED] subcritical fleet relative to the peers [REDACTED]

Subcritical Units – Spend vs. EAF Trend



- During the period from 2006-2010, AEP spent [redacted] per year [redacted] on subcritical units [redacted]
- AEP's spend includes planned outage expenditures in 2008 & 2010 for [redacted] and 2009 for [redacted]
- Fleet spend excluding [redacted] would [redacted] which is mid-way in the 2nd quartile in spending (approximately [redacted] less per year than peers).
- During this same period, availability was [redacted] ([redacted] in prior period)

AEP is spending [redacted]

[redacted] versus the peers

[redacted] unit availability

Subcritical Units – Performance Factors

Sub-critical Coal Units (>350 MW)
Comparison with Navigant Units 2006-2010 Quartiles

	Best	1st Quartile	2nd Quartile	Median	3rd Quartile	4th Quartile	Worst
Equivalent Availability Factor (EAF)	93.2	89.7	86.7	83.7	79.8	69.6	
Planned Outage Factor (POF)	0.0	3.9	5.6	8.2	11.1	28.4	
Equivalent Unplanned Outage Factor (EUOF)	1.0	4.1	6.5	8.8	11.1	28.0	
Equivalent Forced Outage Rate (EFOR)	0.4	2.8	4.9	7.4	11.1	24.4	
O&M + Capital (\$/kW) - ex FGD, SCR & Allowances	\$20.34	\$38.65	\$50.44	\$58.36	\$63.12	\$122.88	
O&M + Capital (\$/MWh) - ex FGD, SCR & Allowances	\$3.26	\$5.61	\$7.22	\$9.05	\$8.37	\$18.26	
Fuel (\$/MWh)	\$0.76	\$12.63	\$18.71	\$27.36	\$20.52	\$47.87	

AEP
=2006-2010
AEP
Average
Unweighted

AEP
=2006-2010
Sample
Average
Unweighted

AEP's EAF performance was driven by both extended planned outages and as well as Forced &/or Maintenance Outages in two or more years at [redacted] and [redacted]. The financial metrics show the AEP units are [redacted].

Note – All AEP units were in [redacted]

AEP's subcritical coal fleet [redacted] all other measures [redacted]

Subcritical Units – Cost Summaries

- The tables below break down the 5-year average spends into Operations and continuing Maintenance & Capital components:
- In contrast with the supercritical units, AEP's total spend on its subcritical units [REDACTED]
 - The primary driver of this is maintenance costs at [REDACTED] (excluding [REDACTED] & [REDACTED] AEP's fleet average for maintenance and total spend would fall approximately mid-way in the 2nd quartile)
 - Operations costs were also [REDACTED] at [REDACTED] with the fleet excluding [REDACTED] coming in at [REDACTED].
- Note – The total is the sum of Operations and Maintenance spend and not the same as the spend seen on slide 14

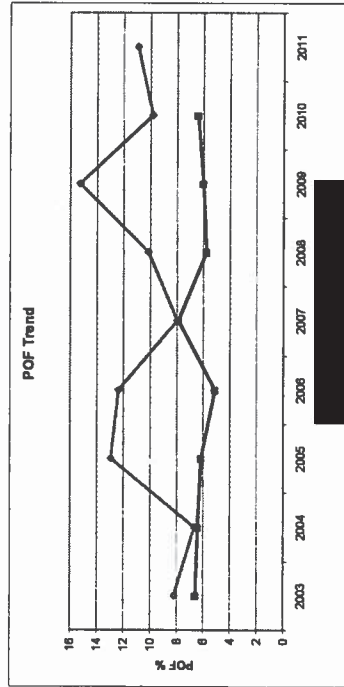
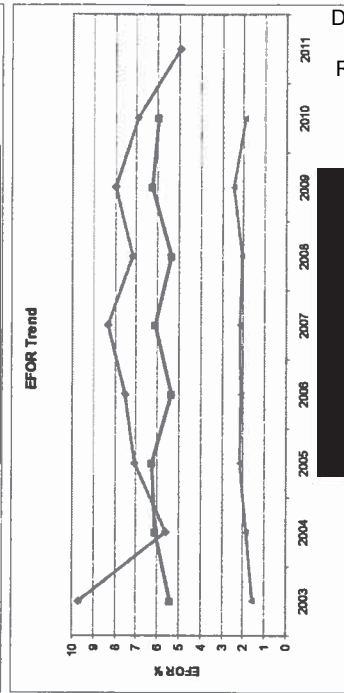
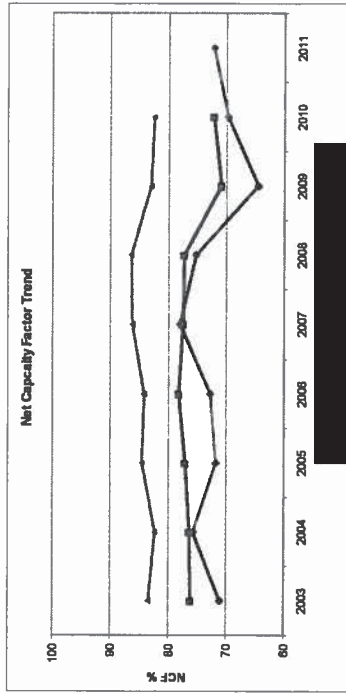
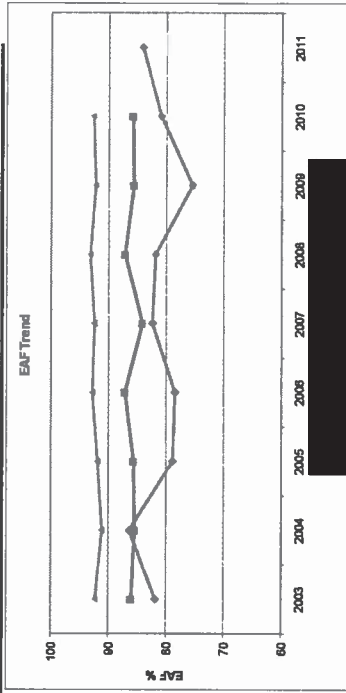
	\$/kW				\$/MWh			
	AEP Ave	Average	Median	Peer 1st Quartile	AEP Ave	Average	Median	Peer 1st Quartile
All Units ex FGD, SCR & Allowance Costs	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Operations	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Maintenance	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Total	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Unit	EAF	EFOR	POF	EUOF	NCF
AEP Fleet Average	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Peer Median	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Peer Best Quartile	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

AEP's Total Spend on it's subcritical units, [REDACTED]

Subcritical Units – Performance Trends

- The charts show how AEP subcritical units have trended versus peer units
- Peer unit EAF has been [redacted] since 2003 with 1st Quartile units running at [redacted]
- [redacted]
- [redacted] the Peer [redacted] associated with EAF
- Peer unit EFOR has [redacted] with 1st Quartile units running at [redacted]
- [redacted] the peer average



AEP's subcritical units have [redacted] years, which [redacted]

[redacted] in the last [redacted]

FGD, SCR and Allowance Costs

FGD, SCR and Allowance costs are shown separately from other costs for two primary reasons

- First, AEP fleet results were largely driven, for both the super and subcritical units, by a few units with the rest of the fleet operating close to the peers
- Second, some of the cost differential may be due to the specific rules and regulations covering each unit and may not show potential opportunity for improvement

The AEP Supercritical fleet:

FGD annual average spend was [redacted] the peers

- This was largely driven by [redacted] and [redacted] (
- For [redacted] the annual average spend was [redacted] and [redacted]
- [redacted] having higher spend)
- [redacted] were close to the Peers with annual average spend at [redacted] and [redacted] (less than the average but in the 3rd quartile close to the median)

SCR annual average spend was [redacted]

- 5 AEP units had spend less than the peer average with 4 of these in the 2nd quartile for spend ([redacted] was in the lowest cost quartile), the [redacted] and [redacted] & [redacted] (only [redacted])

The AEP Subcritical FGD annual average spend [redacted]

- This was largely driven by [redacted]
- For [redacted] the annual average spend was [redacted] and [redacted]
- [redacted] and [redacted] were close to the Peers with annual average spend at [redacted] and [redacted]

See next page for table values

FGD and SCR Costs

Supercritical Units	\$/kW				\$/MWh			
	AEP Ave	Average	Peer Median	1st Quartile	AEP	Average	Peer Median	1st Quartile
FGD Operation & Maintenance								
Operations								
Maintenance								
Total Spend								
SCR Operation & Maintenance								
Operations								
Maintenance								
Total Spend								
Allowances								
Total Spend								

Allowance costs for units with allowance costs

Subcritical Units	\$/kW				\$/MWh			
	AEP Ave	Average	Peer Median	1st Quartile	AEP	Average	Peer Median	1st Quartile
FGD Operation & Maintenance								
Operations								
Maintenance								
Total Spend								
Allowances								
Total Spend								

Allowance costs for units with allowance costs, for AEP - [redacted] only