Attachment 1

SOx RECLAIM
Refinery Committee Meeting

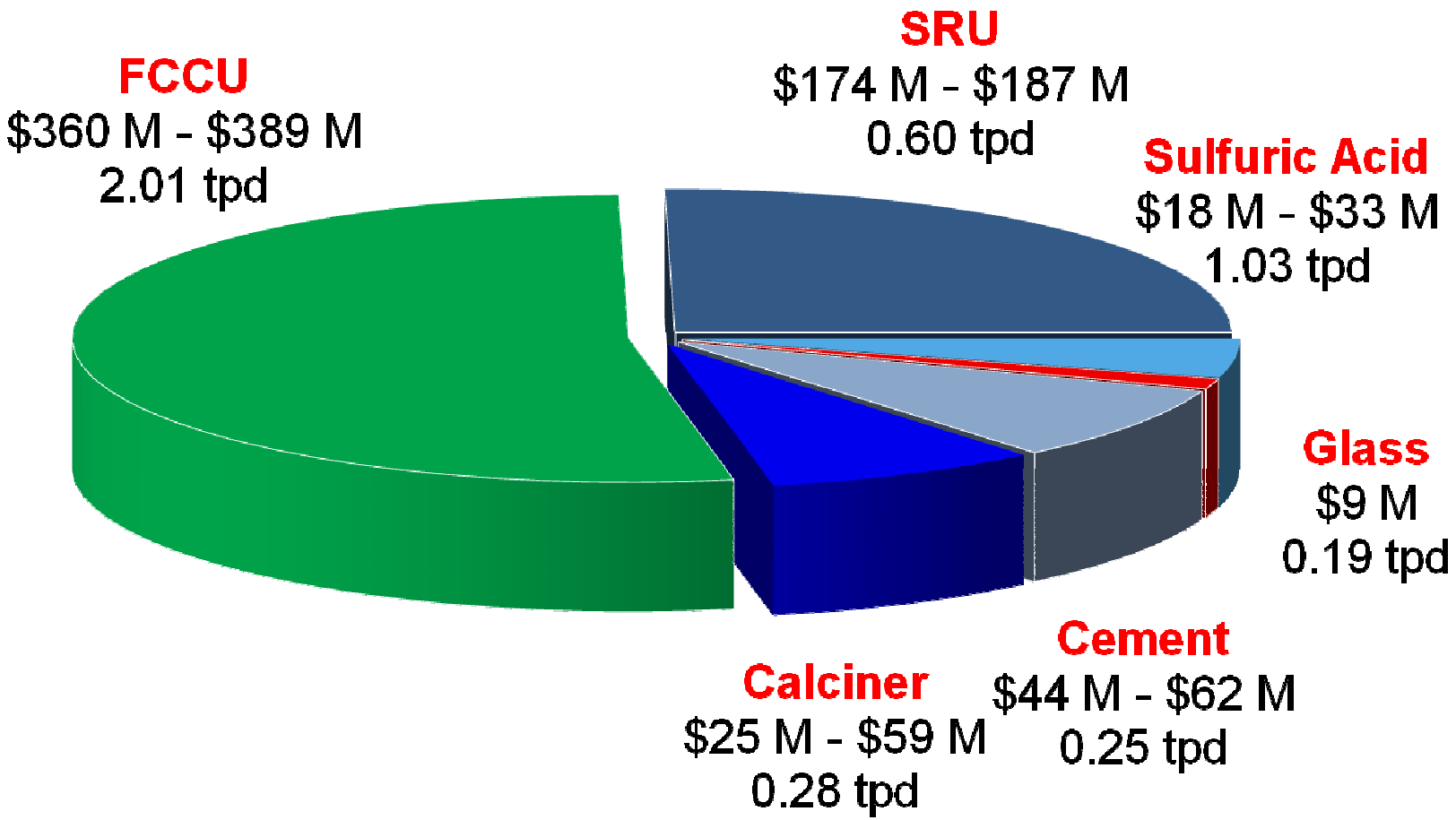
September 22, 2010

Explaining the Gap on Cost Estimates

- WSPA's estimate = $2.85 billion (60% shave)
- Limited information on WSPA/ENVIRON presentation
- Difficult format for meaningful analysis
- Overlapping costs (e.g. hydrotreating, DeSOx, wet gas scrubbing)
- Does not reflect the revised 55% shave scenario

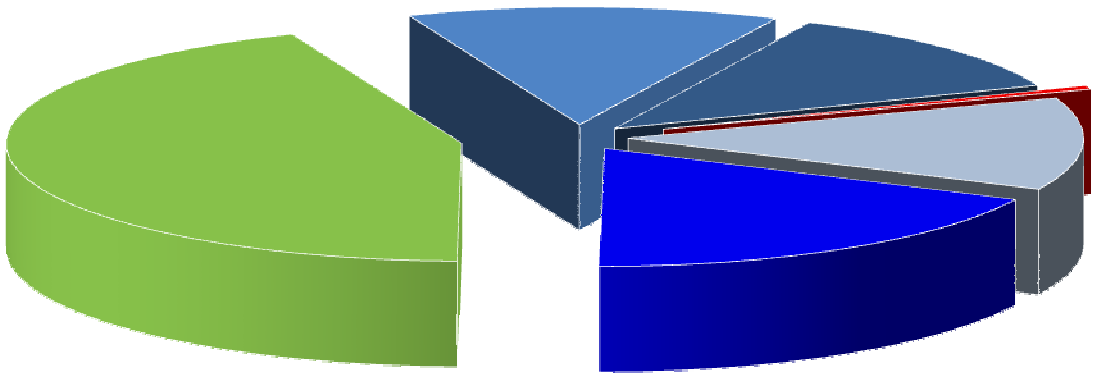
Estimate	Reasons
$2,850 M	
- $720 M	Remove costs for boilers/heaters control options
- $101 M	Remove costs for early controls already in place
- $467 M	Remove costs for cost-ineffective units
$1,562 M	
- $700 M	Remove overestimated costs for FCCU's WGSs
+ $196 M	**Add consultant's estimates for FCCU's WGSs (2 outliers)**
- $459 M	Remove overestimated costs for SRU/TG's WGS
+ $73 M	**Add consultant's estimate for SRU/TG's WGS (1 outlier)**
$672 M	

Costs & Emission Reductions by Equipment Category (based on Consultants' Input)



SOx RECLAIM project = $630 - $738 million, 5.4 tpd emission reductions, cost effectiveness $15 - $19 K per ton
Refinery sector = $561 - $638 million (86% total costs), 3.9 tpd emission reductions (73% total reductions)
FCCU controls = 53% of total costs and 53% of total emission reductions

Costs & Emission Reductions by Refinery (based on Consultants' Input)



Refinery 4
$78 M - $84 M
0.2 tpd

Refinery 2
$60 M - $76 M
0.17 tpd

Refinery 6
$232 M - $279 M
1.51 tpd

Refinery 5
$2 M - $3 M
0.03 tpd

Refinery 1
$76 M - $81 M
0.58 tpd

Refinery 3
$112 M - $115 M
0.43 tpd

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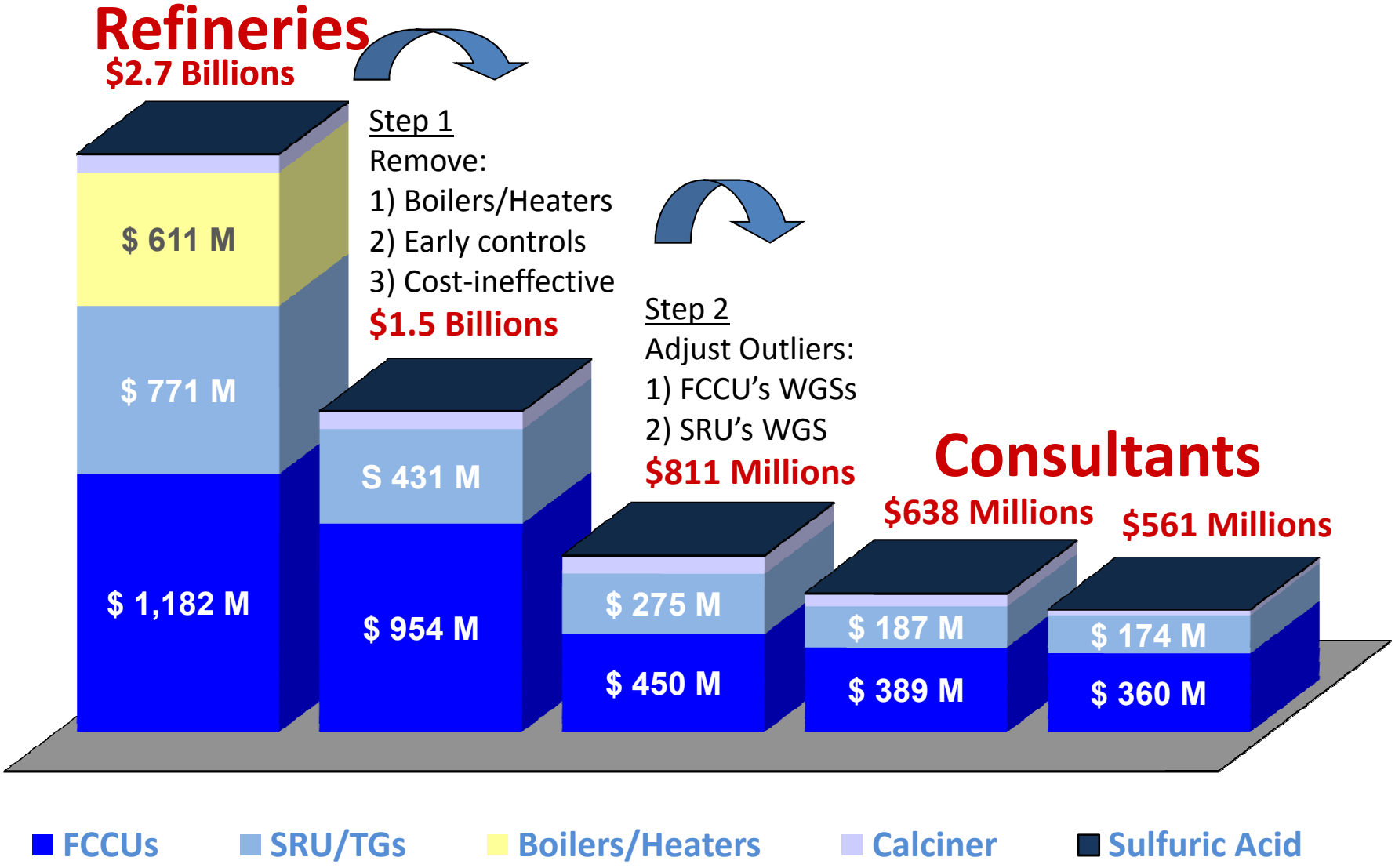
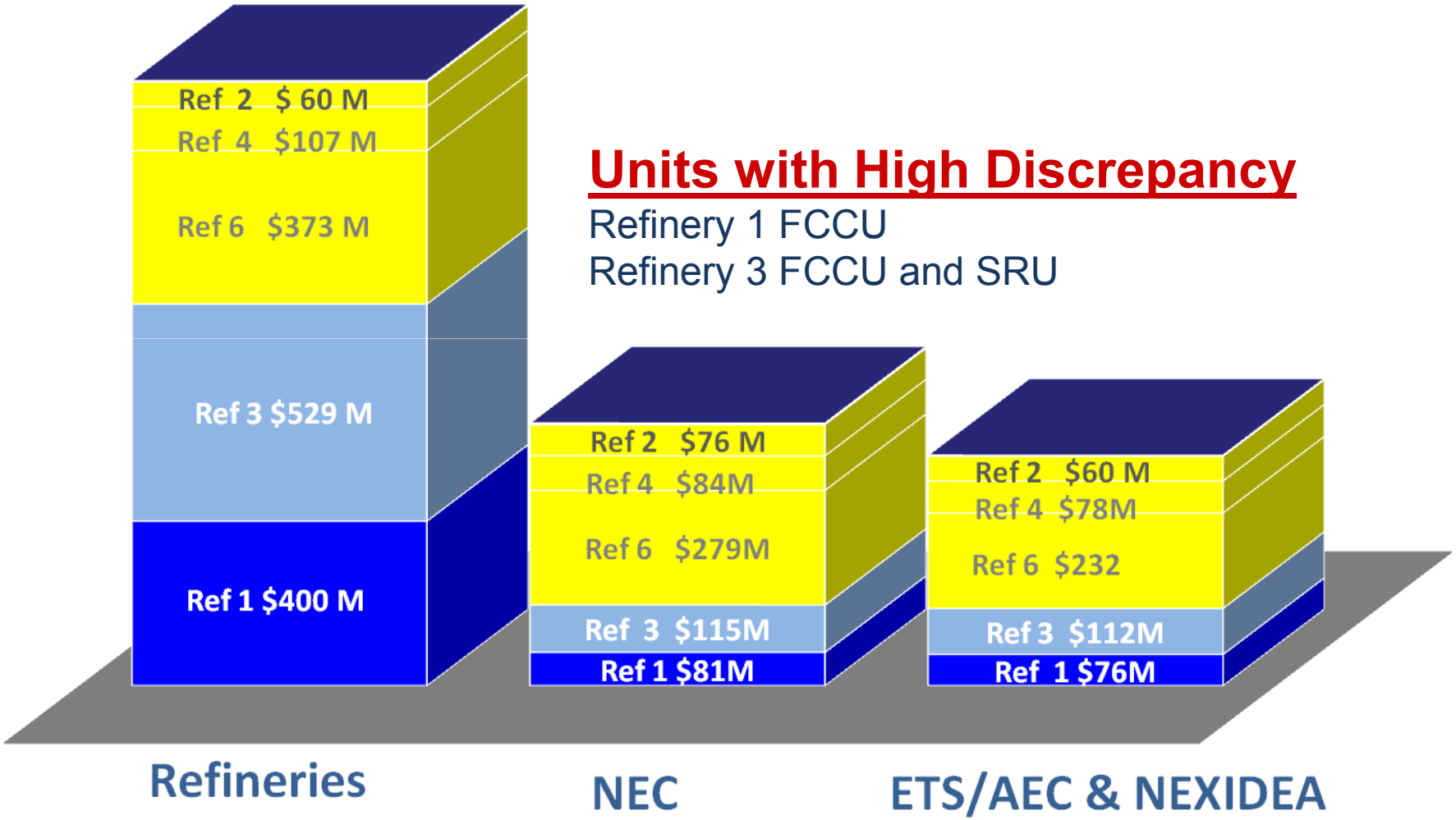
Explaining the Gap in Two Steps



Step 1: 2.7 billions –(611millions for boilers/heaters +101 millions for early controls + 467 million for cost-ineffective)= 1,471 millions
Step 2: 1.47 billion – (700 millions for FCCUs + 229 millions for SRU as refinery's estimate) + (196 millions for FCCUs + 73 millions for SRU as consultants' estimate) = 811 millions

Explaining the Gap in Two Steps

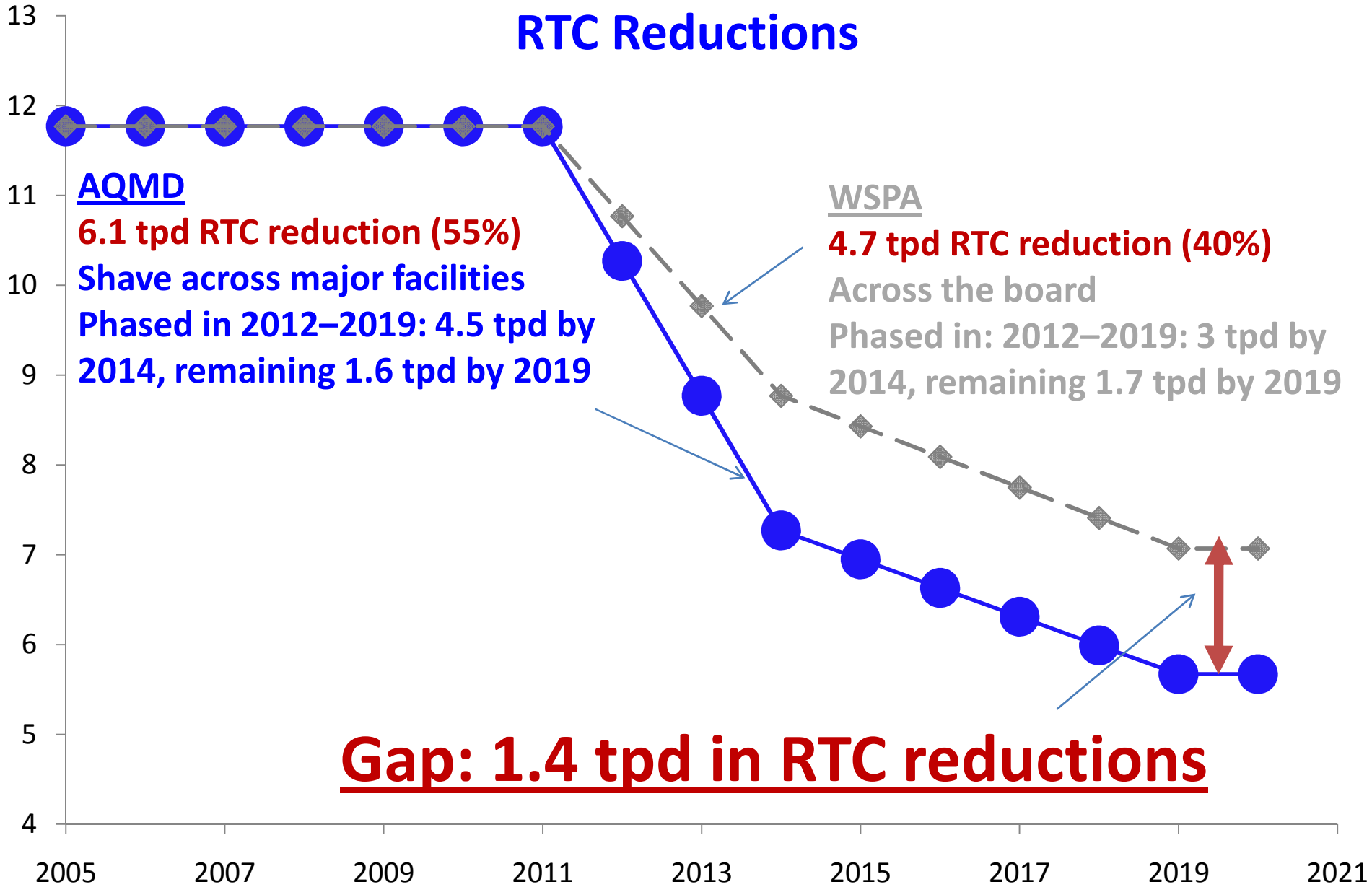


Units with High Discrepancy

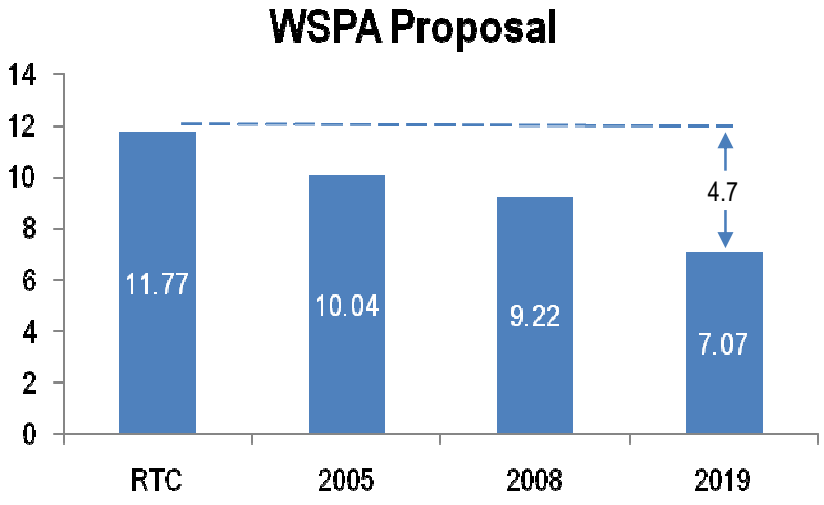
Refinery 1 FCCU

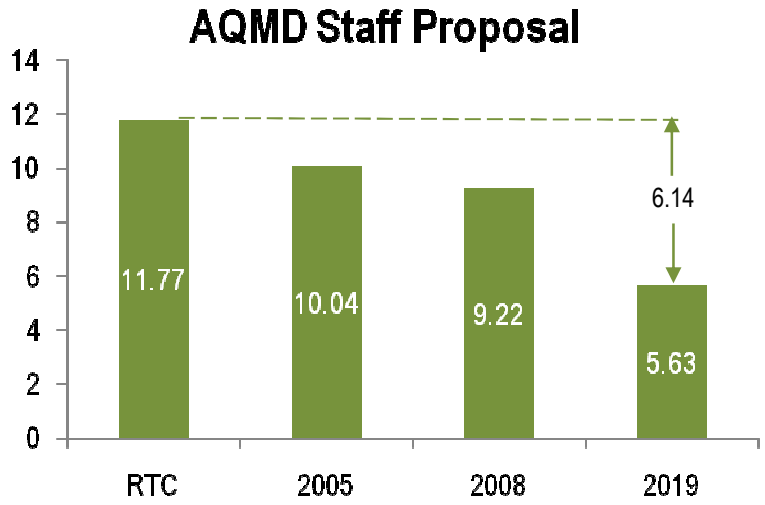
Refinery 3 FCCU and SRU

Staff's versus WSPA's Proposal
RTC Reductions



BARCT Reductions 2005 = 5.35 TPD





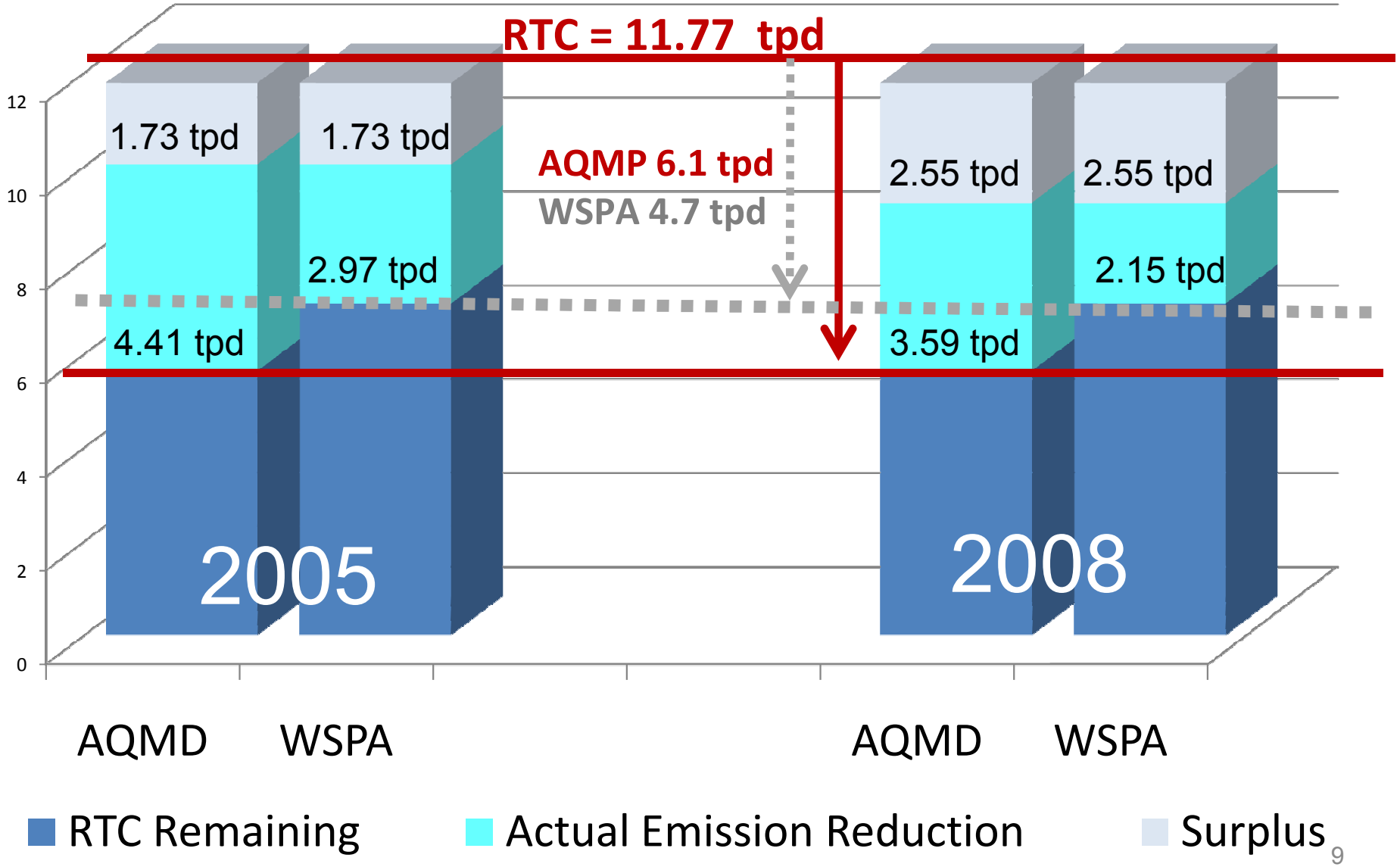
RTC = Reduction

RTC = Remaining Emissions

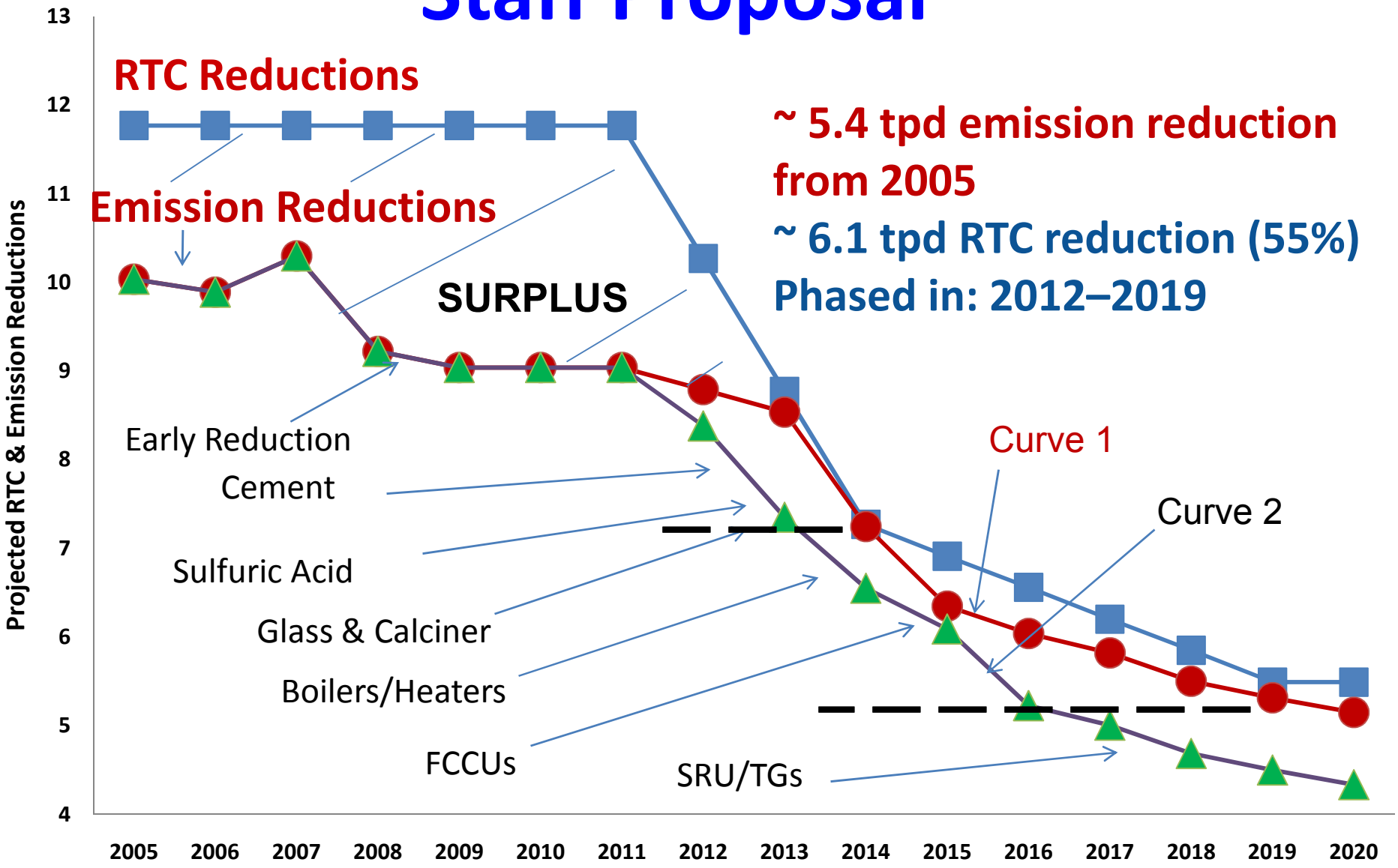
Summary Table (TPD)

	WSPA	AQMD
RTC Reductions	4.7	6.14
Act. Reductions 2005	2.97	4.41
Act Reductions 2008	2.15	3.59

Staff's versus WSPA's Proposal
RTC Reductions



Staff Proposal



Emissions - Curve 1: BARCT for staff proposal. Curve 2: Additional opportunity for reductions from boilers/heaters

Potential Strategy Options - Target 55% Shave

		Consultants' Estimates of PWV ($ Million)	Cumulative Costs ($ Million)	Emission Reductions (Tons per Day)	Cumulative Emission Reductions (Tons per Day)	
Surplus and Early Compliance			**N/A**	**2.73**	**2.73**	
Boilers/Heaters	**Ref 1**	1	**1**	0.06	**2.79**	
Sulfuric Acid		30	**31**	1.00	**3.79**	**WSPA Minimum reductions needed to reach 40% shave**
Boilers/Heaters	**Ref 4**	16	**47**	0.35	**4.14**	
Glass		9	**55**	0.19	**4.32**	
Sulfuric Acid	**Ref 5**	3	**58**	0.03	**4.36**	
FCCU	**Ref 6**	109	**167**	0.94	**5.29**	
FCCU	**Ref 1**	81	**249**	0.58	**5.87**	
Boilers/Heaters	**Ref 5**	64	**312**	0.33	**6.21**	
Coke Calciner	**Ref 6**	59	**371**	0.28	**6.49**	
Kilns		62	**433**	0.25	**6.73**	
Boilers/Heaters	**Ref 2**	20	**453**	0.07	**6.80**	
SRU	**Ref 6**	110	**563**	0.29	**7.09**	
FCCU	**Ref 3**	115	**678**	0.28	**7.38**	
FCCU	**Ref 4**	84	**762**	0.20	**7.58**	
Boilers/Heaters	**Ref 3**	15	**777**	0.04	**7.62**	
SRU	**Ref 2**	76	**853**	0.17	**7.79**	
SRU	**Ref 3**	17	**870**	0.15	**7.93**	

AQMD Minimum reductions needed to reach 55% shave

Next Steps

- Continue to meet with stakeholders
- Draft Program Environmental Assessment – released on August 18, 2010. Comments due by October 1, 2010 (45-day review)
- Socioeconomic analysis on going; to be released 30 days prior to public hearing
- Set Hearing – October 2010
- Public Hearing – November 2010