IPM SNCR COST
COAL CREEK STATION
RETROFIT FACTOR = 1.0

Variable	Designation	Units	Value	Calculation
Boiler Type			TANGENTIAL	User Input
Unit Size	A	MW	601.5	User Input
Retrofit Factor	B		1	User Input "Average" = 1.0
Heat Rate	C	Btu/kw-hr	10000	User Input
NOx Rate	D	lb/MMbtu	0.153	User Input
SO2 rate	E	lb/MMBtu	2	User Input
Type of Coal			lignite	User Input
Coal Factor	F		1.07	Bit. = 1.0; PRB = 1.06; Lignite = 1.07
Heat Rate Factor	G		1	C/10,000
Heat Input	H	Btu/hr	6.015E+09	A*C*1000
Capacity Factor	I		87	User Input
NOx Removal Eff.	J	%	20	User Input
NOx Removed	K	lb/hr	1.841E+02	$D*H/10^6*J/100$
Urea Rate (100%)	L	lb/hr	8.003E+02	K/UF/46*30 UF=0.25 FOR CFB OR D>0.3; OTHERWISE 0.15
Water Required	M	lb/hr	7202.308696	L*9
Aux. Power	N	%	0.05	
Dilution Water Rate	O	1000 gph	0.864277043	M*0.12/1000
Urea Cost 50% Soln.	P	$/ton	250	User Input
Aux. Power Cost	Q	$/kwh	0.06	User Input
Dilution Water Cost	R	$/kgal	3	User Input
Op. Labor Rate	S	$/hr	60	User Input
Capital Cost Calculation				
BMS	2,995,735			SNCR (Injectors, blowers, DCS, Reagent System) Cost
BMA	0			Air Heater Modifications
BMB	4,171,636			Balance of the Plant Cost (Piping, Including Site Upgrades)
BM	7,167,371			Total Bare Module Cost including retrofit factor
Total Project Cost				

IPM SNCR COST
COAL CREEK STATION
RETROFIT FACTOR = 1.0

A1	716,737			Engineering and Construction Management Costs (10% of BM)
A2	716,737			Labor Adjustment (10% of BM)
A3	716,737			Contractor Profit and Fees (10% of BM)
CECC	9,317,582			Capital, Engineering, and Construction Cost Subtotal (BM+A1+A2+A3)
B1	465,879			Owner's Cost (5% of CECC)
TPC	9,783,461			Total Project Cost (CECC + B1) (2009 dollars)

TPC (2011 dollars) = (9,783,461)(1.05) = $10,272,634

IPM SNCR COST
COAL CREEK STATION
RETROFIT FACTOR = 1.3

Variable	Designation	Units	Value	Calculation
Boiler Type			Tangential	User Input
Unit Size	A	MW	601.5	User Input
Retrofit Factor	B		1.3	User Input "Average" = 1.0
Heat Rate	C	Btu/kw-hr	10000	User Input
NOx Rate	D	lb/MMbtu	0.153	User Input
SO2 rate	E	lb/MMBtu	2	User Input
Type of Coal			lignite	User Input
Coal Factor	F		1.07	Bit. = 1.0; PRB = 1.06; Lignite = 1.07
Heat Rate Factor	G		1	C/10,000
Heat Input	H	Btu/hr	6.02E+09	A*C*1000
Capacity Factor	I		87	User Input
NOx Removal Eff.	J	%	20	User Input
NOx Removed	K	lb/hr	1.84E+02	$D*H/10^6*J/100$
Urea Rate (100%)	L	lb/hr	8.00E+02	K/UF/46*30 UF=0.25 FOR CFB OR D>0.3; OTHERWISE 0.15
Water Required	M	lb/hr	7202.308696	L*9
Aux. Power	N	%	0.05	
Dilution Water Rate	O	1000 gph	0.864277043	M*0.12/1000
Urea Cost 50% Soln.	P	$/ton	250	User Input
Aux. Power Cost	Q	$/kwh	0.06	User Input
Dilution Water Cost	R	$/kgal	3	User Input
Op. Labor Rate	S	$/hr	60	User Input
Capital Cost Calculation				
BMS	3,894,456			SNCR (Injectors, blowers, DCS, Reagent System) Cost
BMA	0			Air Heater Modifications
BMB	4,171,636			Balance of the Plant Cost (Piping, Including Site Upgrades)
BM	8,066,092			Total Bare Module Cost including retrofit factor
Total Project Cost				
A1	806,609			Engineering and Construction Management Costs (10% of BM)

IPM SNCR COST
COAL CREEK STATION
RETROFIT FACTOR = 1.3

A2	806,609			Labor Adjustment (10% of BM)
A3	806,609			Contractor Profit and Fees (10% of BM)
CECC	10,485,919			Capital, Engineering, and Construction Cost Subtotal (BM+A1+A2+A3)
B1	524,296			Owner's Cost (5% of CECC)
TPC	11,010,215			Total Project Cost (CECC + B1) (2009 dollars)

TPC (2011 dollars) = (11,010,215)(1.05) = 11,560,726

IPM SNCR COST
COAL CREEK STATION
RETROFIT FACTOR = 1.6

Variable	Designation	Units	Value	Calculation
Boiler Type			Tangential	User Input
Unit Size	A	MW	600	User Input
Retrofit Factor	B		1.6	User Input "Average" = 1.0
Heat Rate	C	Btu/kw-hr	10000	User Input
NOx Rate	D	lb/MMbtu	0.153	User Input
SO2 rate	E	lb/MMBtu	2	User Input
Type of Coal			lignite	User Input
Coal Factor	F		1.07	Bit. = 1.0; PRB = 1.06; Lignite = 1.07
Heat Rate Factor	G		1	C/10,000
Heat Input	H	Btu/hr	6.015E+09	A*C*1000
Capacity Factor	I		87	User Input
NOx Removal Eff.	J	%	20	User Input
NOx Removed	K	lb/hr	184.059	$D*H/10^6*J/100$
Urea Rate (100%)	L	lb/hr	800.2565217	K/UF/46*30 UF=0.25 FOR CFB OR D>0.3; OTHERWISE 0.15
Water Required	M	lb/hr	7202.308696	L*9
Aux. Power	N	%	0.05	
Dilution Water Rate	O	1000 gph	0.864277043	M*0.12/1000
Urea Cost 50% Soln.	P	$/ton	250	User Input
Aux. Power Cost	Q	$/kwh	0.06	User Input
Dilution Water Cost	R	$/kgal	3	User Input
Op. Labor Rate	S	$/hr	60	User Input
Capital Cost Calculation				
BMS	4,788,153			SNCR (Injectors, blowers, DCS, Reagent System) Cost
BMA	0			Air Heater Modifications
BMB	4,168,200			Balance of the Plant Cost (Piping, Including Site Upgrades)
BM	8,956,352			Total Bare Module Cost including retrofit factor
Total Project Cost				
A1	895,635			Engineering and Construction Management Costs (10% of BM)

IPM SNCR COST
COAL CREEK STATION
RETROFIT FACTOR = 1.6

A2	895,635			Labor Adjustment (10% of BM)
A3	895,635			Contractor Profit and Fees (10% of BM)
CECC	11,643,258			Capital, Engineering, and Construction Cost Subtotal (BM+A1+A2+A3)
B1	582,163			Owner's Cost (5% of CECC)
TPC	12,225,421			Total Project Cost (CECC + B1) 2009 dollars

TPC (2011) = (12,225,421)(1.05) = $12,836,692