## 10-31-2013-energy-cost-calculator-generic-power-only

Input are highlighted in green

### Capital Cost

CapitalCost=70000000

### Electrical and Fuel--base year

NetPlantCapacity=25000

CapacityFactor=85

AnnualHours=CapacityFactor/100\*8760

NetStationEfficiency=20

FuelHeatingValue=18608

FuelConsumptionRate=NetPlantCapacity/(NetStationEfficiency/100)\*3600/FuelHeatingValue/1000

FuelAshConcentration=5

AnnualGeneration=NetPlantCapacity\*8760\*CapacityFactor/100

CapitalCostNEC=CapitalCost/NetPlantCapacity

AnnualFuelConsumption=FuelConsumptionRate\*AnnualHours

AnnualAshDisposal=AnnualFuelConsumption\*FuelAshConcentration/100

### Expenses--base year

FuelCost=22.05

LaborCost=2000000

MaintenanceCost=1500000

InsurancePropertyTax=1400000

Utilities=200000

AshDisposal=100000

Management=200000

OtherOperatingExpenses=400000

TotalNonFuelExpenses=LaborCost+MaintenanceCost+InsurancePropertyTax+Utilities+AshDisposal+Management+OtherOperatingExpenses

TotalExpensesIncludingFuel=FuelCost\*AnnualFuelConsumption+TotalNonFuelExpenses

FuelCostKwh=AnnualFuelConsumption\*FuelCost/AnnualGeneration

LaborCostKwh=LaborCost/AnnualGeneration

MaintenanceCostKwh=MaintenanceCost/AnnualGeneration

InsurancePropertyTaxKwh=InsurancePropertyTax/AnnualGeneration

UtilitiesKwh=Utilities/AnnualGeneration

AshDisposalKwh=AshDisposal/AnnualGeneration

ManagementKwh=Management/AnnualGeneration

OtherOperatingExpensesKwh=OtherOperatingExpenses/AnnualGeneration

TotalNonFuelExpensesKwh=LaborCostKwh+MaintenanceCostKwh+InsurancePropertyTaxKwh+UtilitiesKwh+AshDisposalKwh+ManagementKwh+OtherOperatingExpensesKwh

TotalExpensesIncludingFuelKwh=FuelCostKwh+TotalNonFuelExpensesKwh

### Taxes

FederalTaxRate=34

StateTaxRate=9.6

ProductionTaxCredit=0.009

CombinedTaxRate=StateTaxRate+FederalTaxRate\*(1-StateTaxRate/100)

### Financing

DebtRatio=75

EquityRatio =100-DebtRatio

InterestRateOnDebt=5

EconomicLife=20

CostOfEquity=15

CostOfMoney =DebtRatio/100\*InterestRateOnDebt+EquityRatio/100\*CostOfEquity

TotalCostOfPlant =CapitalCost

TotalEquityCost =TotalCostOfPlant\*EquityRatio/100

TotalDebtCost =TotalCostOfPlant\*DebtRatio/100

CapitalRecoveryFactorEquity =CostOfEquity/100\*(1+CostOfEquity/100)^EconomicLife/((1+CostOfEquity/100)^EconomicLife-1)

CapitalRecoveryFactorDebt=InterestRateOnDebt/100\*(1+InterestRateOnDebt/100)^EconomicLife/((1+InterestRateOnDebt/100)^EconomicLife-1)

AnnualEquityRecovery =CapitalRecoveryFactorEquity\*TotalEquityCost

AnnualDebtPayment =TotalDebtCost\* CapitalRecoveryFactorDebt

DebtReserve =AnnualDebtPayment

### Income other than energy

CapacityPayment=166

InterestRateonDebtReserve=5

AnnualCapacityPayment=CapacityPayment\*NetPlantCapacity

AnnualDebtReserveInterest=DebtReserve\*InterestRateonDebtReserve/100

### Escalation/Inflation

GeneralInflation=2.1

EscalationFuel=2.1

EscalationForProductionTaxCredit=2.1

EscalationOther=2.1

### Depreciation Schedule

DepreciationFraction =1/EconomicLife

### Annual Cash Flows

Common vars in each year are highlighted in yellow

#### Year1

EquityRecovery =AnnualEquityRecovery

EquityInterest1 =CostOfEquity/100\*TotalEquityCost

EquityPrincipalPaid1 =EquityRecovery-EquityInterest1

EquityPrincipalRemaining1 =TotalEquityCost-EquityPrincipalPaid1

DebtRecovery =AnnualDebtPayment

DebtInterest1 =InterestRateOnDebt/100\*TotalDebtCost

DebtPrincipalPaid1 =DebtRecovery-DebtInterest1

DebtPrincipalRemaining1 =TotalDebtCost-DebtPrincipalPaid1

FuelCost1 =AnnualFuelConsumption\*FuelCost

NonFuelExpenses1 =TotalNonFuelExpenses

DebtReserve1 =DebtReserve

Depreciation =TotalCostOfPlant\*DepreciationFraction

CapacityIncome =AnnualCapacityPayment

InterestOnDebtReserve =AnnualDebtReserveInterest

TaxesWoCredit1 =((CombinedTaxRate/100)/(1-CombinedTaxRate/100))\*(EquityPrincipalPaid1+DebtPrincipalPaid1+EquityInterest1-Depreciation+DebtReserve1)

TaxCredit1 =AnnualGeneration\*ProductionTaxCredit\*TaxCreditFrac1

Taxes1 =((CombinedTaxRate/100)/(1-CombinedTaxRate/100))\*(EquityPrincipalPaid1+DebtPrincipalPaid1+EquityInterest1-Depreciation+DebtReserve1-TaxCredit1)

EnergyRevenueRequired1 =EquityRecovery+DebtRecovery+FuelCost1+NonFuelExpenses1+Taxes1+DebtReserve1-CapacityIncome-InterestOnDebtReserve

#### Year2

EquityInterest2 =CostOfEquity/100\*EquityPrincipalRemaining1

EquityPrincipalPaid2 =EquityRecovery-EquityInterest2

EquityPrincipalRemaining2 =EquityPrincipalRemaining1-EquityPrincipalPaid2

DebtInterest2 =InterestRateOnDebt/100\*DebtPrincipalRemaining1

DebtPrincipalPaid2 =DebtRecovery-DebtInterest2

DebtPrincipalRemaining2 =DebtPrincipalRemaining1-DebtPrincipalPaid2

FuelCost2 =FuelCost1\*(1+EscalationFuel/100)^(Year-1)

NonFuelExpenses2 =NonFuelExpenses1\*(1+EscalationOther/100)^(Year-1)

DebtReserve2=0

TaxCredit2 =AnnualGeneration\*ProductionTaxCredit\*((1+EscalationForProductionTaxCredit/100)^(Year-1))\*TaxCreditFrac2

The others follow the same pattern as Year2