ENERGY 2020 Documentation

Volume 7

Data Dictionary

Systematic Solutions, Inc.
534 E. Dayton-Yellow Springs Rd.
Fairborn, Ohio 45324
(513) 878-8603

Policy Assessment Corp.
14604 West 62nd Place
Arvada, Colorado 80004
(303) 467-3566

AB (ENDUSE,TECH,EC,YEAR)**: Average Budget** ($spent on energy/$total dollars)

This is the average annual budget for the energy costs of each end-use. The yearly average budget number is determined by the previous budget level, the new budget(NB) after a utility price change and the budget averaging time(BAT). As utility prices rise, the consumer must initially cut back on energy use, but struggles to regain his previous comfort level over time by increasing the dollars spent on energy as his income rises. AB rises as utility prices rise, but more slowly to mimic the lags in consumer response. AB is used in the calculation of the short-term price response of the consumer to changes in utility prices(UMS). The larger the change in utility prices, the bigger the difference will be between the new budget and average budget and the greater the response to price changes will be, holding other factors constant. AB is calculated in the demand sectors(residential, commercial and industrial).

AB (ENDUSE,TECH,EC,YEAR)**: Average Budget** ($spent on energy/$total dollars)

This is the average annual budget for the energy costs of each end-use. The yearly average budget number is determined by the previous budget level, the new budget(NB) after a utility price change and the budget averaging time(BAT). As utility prices rise, the consumer must initially cut back on energy use, but struggles to regain his previous comfort level over time by increasing the dollars spent on energy as his income rises. AB rises as utility prices rise, but more slowly to mimic the lags in consumer response. AB is used in the calculation of the short-term price response of the consumer to changes in utility prices(UMS). The larger the change in utility prices, the bigger the difference will be between the new budget and average budget and the greater the response to price changes will be, holding other factors constant. AB is calculated in the demand sectors(residential, commercial and industrial).

ACDP (AA,YEAR)**: Accumulated Depreciation** (M$)

Accumulated depreciation is determined by taking the previous year's accumulated depreciation and adding the current year's straight line depreciation (SLDP) and any miscellaneous depreciation (MISCDPR) and subtracting retirements of gross assets (RGA).

ACDP (AA,YEAR)**: Accumulated Depreciation** (M$)

Accumulated depreciation is determined by taking the previous year's accumulated depreciation and adding the current year's straight line depreciation (SLDP) and any miscellaneous depreciation (MISCDPR) and subtracting retirements of gross assets (RGA).

ACE : Avoided Cost of Energy

As a step in deregulating the electric generation business and reducing electricity cost, regulators have required electric utilities to offer the avoided cost of generation to third parties willing to build private generating capacity. The avoided cost is often defined as the marginal cost of a new power plant. The marginal costs is calculated as the MW weighted capital and operating cost of forecasted capacity additions The capital cost is the utility capital charge rate time the plant over night cost. The fuel costs are the marginal heat rates times the unit fuel costs and are escalated for test year use. The regulatory commission can require a fraction or multiple of ACE to be offered to third party generators.

ACE :   Avoided Cost of Energy

As a step in deregulating the electric generation business and reducing electricity cost, regulators have required electric utilities to offer the avoided cost of generation to third parties willing to build private generating capacity. The avoided cost is often defined as the marginal cost of a new power plant. The marginal costs is calculated as the MW weighted capital and operating cost of forecasted capacity additions The capital cost is the utility capital charge rate time the plant over night cost. The fuel costs are the marginal heat rates times the unit fuel costs and are escalated for test year use. The regulatory commission can require a fraction or multiple of ACE to be offered to third party generators.

ACM :   Avoided Cost of Electricity Multiplier

The regulatory commission can require a fraction or multiple of ACE to be offered to third party generators. This adjustment enters the model through ACM.

ACM :   Avoided Cost of Elec. Multiplier (DLESS)

This variable is used in the avoided cost of electricity (ACE) equation.

ACM :   Avoided Cost of Elec. Multiplier (DLESS)

This variable is used in the avoided cost of electricity (ACE) equation.

ACM :   Avoided Cost of Electricity Multiplier

The regulatory commission can require a fraction or multiple of ACE to be offered to third party generators. This adjustment enters the model through ACM.

ADCCST (ENDUSE,YEAR)**:   Administrative Costs of Process Efficiency Programs** ($/GJ or $/mBtu)

ADCCST is the overhead or administrative costs of a process efficiency program. This includes costs that are directly attributable to a DSM program, such as labor costs or advertising but are not part of the rebate or subsidy. These costs can either be included in the utility's rate base or expensed. The parameters of the DSM program to be simulated contains this data. The values of ADCCST are in the appropriate data file - rdata, cdata and idata.

ADCCST (ENDUSE,YEAR)**:   Administrative Costs of Process Efficiency Programs** ($/GJ or $/mBtu)

ADCCST is the overhead or administrative costs of a process efficiency program. This includes costs that are directly attributable to a DSM program, such as labor costs or advertising but are not part of the rebate or subsidy. These costs can either be included in the utility's rate base or expensed. The parameters of the DSM program to be simulated contains this data. The values of ADCCST are in the appropriate data file - rdata, cdata and idata.

ADDCST (ENDUSE,YEAR)**: Administrative Costs of Device Efficiency Programs** ($/GJ or $/mBtu)

ADDCST is the overhead or administrative costs of a process efficiency program. This includes costs that are directly attributable to a DSM program, such as labor costs or advertising but are not part of the rebate or subsidy. These costs can either be included in the utility's rate base or expensed. The parameters of the DSM program to be simulated contains this data. The values of ADCCST are in the appropriate data file - rdata, cdata and idata.

ADDCST (ENDUSE,YEAR)**: Administrative Costs of Device Efficiency Programs** ($/GJ or $/mBtu)

ADDCST is the overhead or administrative costs of a process efficiency program. This includes costs that are directly attributable to a DSM program, such as labor costs or advertising but are not part of the rebate or subsidy. These costs can either be included in the utility's rate base or expensed. The parameters of the DSM program to be simulated contains this data. The values of ADCCST are in the appropriate data file - rdata, cdata and idata.

ADP (YEAR)**: Annual Average Load** (MW)

ADP (YEAR)**: Annual Average Load** (MW)

ADPDIF (YEAR)**: ADP Different from XADP** MW

This value represents the difference between the actual and the forecasted load values. It is used in the exogenous specification of future demand. The exogenous forecast is adjusted to reflect the differences between the loads.

ADPDIF (YEAR)**: ADP Different from XADP** (MW)

This value represents the difference between the actual and the forecasted load values. It is used in the exogenous specification of future demand. The exogenous forecast is adjusted to reflect the differences between the loads.

ADPGI : Initial Growth Rate in Avg. Demand (1/YR)

An exogenously specified growth rate for the first year of simulation.

ADPGI : Initial Growth Rate in Avg. Demand (1/YR)

An exogenously specified growth rate for the first year of simulation.

ADPGR (HORIZON,YEAR)**: ADP Growth Rate** (1/YR)

Based on the smoothing function (ADPSM) and a smoothing constant (USMT), a growth rate is computed (ADPGR) for the average load.

ADPGR (HORIZON,YEAR)**: ADP Growth Rate** (1/YR)

Based on the smoothing function (ADPSM) and a smoothing constant (USMT), a growth rate is computed (ADPGR) for the average load.

ADPM : Average Electric Load

Average electric load is the average of the system load duration curve plus any pumped storage.

ADPM : Average Electric Load

Average electric load is the average of the system load duration curve plus any pumped storage.

ADPSM (HORIZON,LV2,YEAR)**: Smoothed ADP for Extrapolation Macro (MW)** (MW)

This is the intermediate value of the smoothing functions for average load. Two versions are calculated one using the historical averaging time and the other the smoothing time. It is used to compute the average load growth rate.

ADPSM (HORIZON,LV2,YEAR)**: Smoothed ADP for Extrapolation Macro (MW)** (MW)

This is the intermediate value of the smoothing functions for average load. Two versions are calculated one using the historical averaging time and the other the smoothing time. It is used to compute the average load growth rate.

ADTC (YEAR)**: Accumulated Deferred Investment Tax Credits** (M$)

Accumulated deferred investment tax credits are increased with deferred tax credits (DFITC) and reduced by the amount amortized (AMTC).

ADTC (YEAR)**: Accum. Deferred Investment Tax Credits** (M$)

Accumulated deferred investment tax credits are increased with deferred tax credits (DFITC) and reduced by the amount amortized (AMTC).

ADTX (YEAR)**: Accumulated Deferred Taxes from Depreciation** (M$)

In normalized accounting, the utility accumulated deferred taxes from using liberalized depreciation (TDDDP) relative to the level straight-lien depreciation (SLDCW).

ADTX (YEAR)**: Accumulated Deferred Taxes from Depreciation** (M$)

In normalized accounting, the utility accumulated deferred taxes from using liberalized depreciation (TDDDP) relative to the level straight-lien depreciation (SLDCW).

AFAC (PLANT,LV12,YEAR)**: Accumulated AFUDC** (M$)

Accumulated allowance for funds used during construction (AFUDC) is the integral of yearly AFUDC.

AFAC (PLANT,LV12,YEAR)**: Accumulated AFUDC** (M$)

Accumulated allowance for funds used during construction (AFUDC) is the intergral of yearly AFUDC.

AFACI (PLANT,LV12)**: Initial Value for Accumulated AFUDC** (M$)

Initial Accumulated allowance for funds used during construction (AFUDC) is exogenously specified.

AFACI (PLANT,LV12)**: Initial Value for Accumulated AFUDC** (M$)

Initial Accumulated allowance for funds used during construction (AFUDC) is exogenously specified.

AFAF (YEAR)**: AFUDC from the Deferred Rate Base** (M$/YR)

AFUDC from deferred rate base (AFAF) is a function of the construction work portion of the deferred rate base, the AFUDC portion of the deferred rate base and the gross rate for AFUDC. It is used in the calculation of AFDFRB.

AFAF (YEAR)**: AFUDC from the Deferred Rate Base** (M$/YR)

AFUDC from deferred rate base (AFAF) is a function of the construction work portion of the deferred rate base, the AFUDC portion of the deferred rate base and the gross rate for AFUDC. It is used in the calculation of AFDFRB.

AFDB (YEAR)**: AFUDC from Debt Funds** (M$/YR)

AFUCD from Debt Funds represents the interest payments the utility would have been given as revenues to cover interest payments and is the product of TAF and AFDBF.

AFDB (YEAR)**: AFUDC from Debt Funds** (M$/YR)

AFUCD from Debt Funds represents the interest payments the utility would have been given as revenues to cover interest payments and is the product of TAF and AFDBF.

AFDBF (YEAR)**: Fraction of AFUDC from Debt Funds** dless

AFDBF is calculated historically as the ratio of XAFDB to XTAF. Future years are calculated as the sum over years of XAFDB divided by the sum over years of XTAF. This calculation is performed in EDATA.

AFDBF (YEAR)**: Fraction of AFUDC from Debt Funds** dless

AFDBF is calculated historically as the ratio of XAFDB to XTAF. Future years are calculated as the sum over years of XAFDB divided by the sum over years of XTAF. This calculation is performed in EDATA.

AFDFRB (YEAR)**: AFUDC portion of Deferred Rate Base** (M$/YR)

The AFUDC portion of the deferred rate base is the interest payments not allowed in the ratebase because the completed plant was not allowed in the ratebase. It is used in the calculation of AFAF.

AFDFRB (YEAR)**: AFUDC portion of Deferred Rate Base** (M$/YR)

The AFUDC portion of the deferred rate base is the interest payments not allowed in the ratebase because the completed plant was not allowed in the ratebase. It is used in the calculation of AFAF.

AFDTX (YEAR)**: Tax Effect of AFUDC for Debt Funds** (M$/YR)

Deferred taxes from AFC are obtained from AFC on borrowed funds if accounting is normalized.

AFDTX (YEAR)**: Tax Effect of AFUDC for Debt Funds** (M$/YR)

Deferred taxes from AFC are obtained from AFC on borrowed funds if accounting si normalized.

AFEQ (YEAR)**: AFUDC from Equity Funds** (M$/YR)

AFUDC from equity funds represents the return on equity the utility would have been allowed to recover if the plants under construction were in service. It is calculated from the product of TAF and (1-AFDBF).

AFEQ (YEAR)**: AFUDC from Equity Funds** (M$/YR)

AFUDC from equity funds represents the return on equity the utility would have been allowed to recover if the plants under construction were in service. It is calculated from the product of TAF and (1-AFDBF).

AFGA (PLANT,YEAR)**: AFUDC into Gross Assets by Plant** (M$)

At the end of each year AFAC is shifted to the next year. If any plants are completed, AFAC is added to AFUDC into Gross Assets - in other words become part of a utility's in-service assets.

AFGA (PLANT,YEAR)**: AFUDC into Gross Assets by Plant** (M$)

At the end of each year AFAC is shifted to the next year. If any plants are completed, AFAC is added to AFUDC into Gross Assets - in other words become part of a utility's in-service assets.

AFGAA (AA,YEAR)**: AFUDC into Gross Assets** (M$)

Total AFUDC into Gross Assets is the sum of the AFUDC into Gross Assets by plant.

AFGAA (AA,YEAR)**: AFUDC into Gross Assets** (M$)

Total AFUDC into Gross Assets is the sum of the AFUDC into Gross Assets by plant.

AFGS (PLANT,YEAR)**: Gross Allow. Funds Used During Construction** (M$/YR)

Gross allowance for funds used during construction is calculated by multiplying the gross rate for AFUDC by the fraction of accumulated construction work not allowed in the rate base.

AFGS (PLANT,YEAR)**: Gross Allow. Funds Used During Construction** (M$/YR)

Gross allowance for funds used during construction is calculated by multiplying the gross rate for AFUDC by the fraction of accumulated construction work not allowed in the rate base.

AFGSR (YEAR)**: Gross Rate for AFUDC** (1/YR)

The gross rate on the allowance for funds used during construction equals the weighted cost of capital times the AFUDC gross rate multiplier. The multiplier incorporates the effects of short term debt on the AFUDC gross rate.

AFGSR (YEAR)**: Gross Rate for AFUDC** (1/YR)

The gross rate on the allowance for funds used during construction equals the weighted cost of capital times the AFUDC gross rate multiplier. The multiplier incorporates the effects of short term debt on the AFUDC gross rate.

AFNTR (YEAR)**: Net Rate for AFUDC** (1/YR)

The AFC rate, net of taxes, is calculated in a similar fashion to those in schedule 212, FERC Form 1. It is the product of the AFC gross rate and combined marginal state and federal income tax rates, times the fraction of AFC that represents debt interest.

AFNTR (YEAR)**: Net Rate for AFUDC** (1/YR)

The AFC rate, net of taxes, is calculated in a similar fashion to those in schedule 212, FERC Form 1. It is the product of the AFC gross rate and combined marginal state and federal income tax rates, times the fraction of AFC that represents debt interest.

AFRB (YEAR)**: AFUDC portion of Nuclear Costs into RB** (M$/YR)

The AFUDC portion of nuclear construction costs in the ratebase is calculated by subtraction the construction work portion (CWRB) from the total (NUCRB).

AFRB (YEAR)**: AFUDC portion of Nuclear Costs into RB** (M$/YR)

The AFUDC portion of nuclear construction costs in the ratebase is calculated by subtraction the construction work portion (CWRB) from the total (NUCRB).

AMSF (ENDUSE,TECH,EC,YEAR)**: Average Market Share** (fraction)

The average market share for each fuel in each sector is calculated in the demand sectors from the ratio of the Production Capacity by Enduse(EUPC) summed across a sector's enduses to total sector production capacity.

AMSF (ENDUSE,TECH,EC,YEAR)**: Average Market Share** (fraction)

The average market share for each fuel in each sector is calculated in the demand sectors from the ratio of the Production Capacity by Enduse(EUPC) summed across a sector's enduses to total sector production capacity.

AMTC (YEAR)**: Amortized Investment Tax Credit** (M$/YR)

Amortized investment tax credits are accumulated deferred tax credits amortized over thirty years.

AMTC (YEAR)**: Amortized Investment Tax Credit** (M$/YR)

Amortized investment tax credits are accumulated deferred tax credits amortized over thirty years.

AREV (YEAR)**: Allowed Revenue** (M$/YR)

Allowed revenue is the amount of revenue calculated in the test year procedure needed to cover utility expenses and allowed rate of return. AREV is sum of the test year revenue, other taxable income and an exogenous revenue adjustment that captures unique or negotiated adjustment to the allowed revenues. In the price procedure, adjustments are made for any unique conditions. AREV is used in the determination of next year's prices.

AREV (YEAR)**: Allowed Revenue** (M$/YR)

Allowed revenue is the amount of revenue calculated in the test year procedure needed to cover utility expenses and allowed rate of return. AREV is sum of the test year revenue, other taxable income and an exogeous revenue adjustment that captures unique or negotiated adjustment to the allowed revenues. In the price procedure, adjustments are made for any unique conditions. AREV is used in the determination of next year's prices.

AROE (YEAR)**: Allowed Return on Equity** (1/YR)

The allowed return on equity is the real cost of equity and the smoothed inflation rate. The inflation rate is included to reflect market recognition of inflation.

AROE (YEAR)**: Allowed Return on Equity** (1/YR)

The allowed return on equity is the real cost of equity and the smoothed inflation rate. The inflation rate is included to reflect market recognition of inflation.

ATC (YEAR)**: Accumulated Investment Tax Credits** (M$)

The level of accumulated investment tax credits is reduced with claimed tax credits and increased with earned tax credits

ATC (YEAR)**: Accumulated Investment Tax Credits** (M$)

The level of accumulated investment tax credits is reduced with claimed tax credits and increased with earned tax credits

ATCI : Initial Accumulated Investment Tax Credits (M$)

An exogenously specified input variable for the first year of simulation. This is the initial level of tax credits the utility has.

ATCI : Initial Accumulated Investment Tax Credits (M$)

An exogenously specified input variable for the first year of simulation. This is the initial level of tax credits the utility has.

ATDP (AA,YEAR)**: Accelerated Tax Depreciation** (M$/YR)

Tax assets are increased only by completed construction (CWGAA) by asset type (AA). AFC costs cannot be deducted for tax depreciation. Accelerated depreciation equals the remaining tax assets multiplied by a depreciation rete (DPRDD)

ATDP (AA,YEAR)**: Accelerated Tax Depreciation** (M$/YR)

Tax assets are increased only by completed construction (CWGAA) by asset type (AA). AFC costs cannot be deducted for tax depreciation. Accelerated depreciation equals the remaining tax assets multiplied by a depreciation rate (DPRDD)

ATTC : Amortization Time for Inv. Tax Credit (YRS)

An exogenously specified input, usually thirty years, used in calculating amortized deferred tax credits.

ATTC : Amortization Time for Inv. Tax Credit (YRS)

An exogenously specified input, usually thirty years, used in calculating amortized deferred tax credits.

BAT : Short Term Utilization Adjustment Time (YR)

BAT represents the amount of time(number of years) necessary for a consumer to get his budget "back in line" after a price shock. It is used to lag the adjustment of the average budget(AB) in response to price changes. The default budget averaging time based on regression of 1973, 1979 energy demand "rebound" time from price shocks at a national level.(Backus, G. A., DEMAND81: National Energy Policy Model, School of Industrial Engineering, Purdue University, Reports AFC-7 through AFC-10, 1981.) The value is usually set at 2.0 but could differ by +/- 1.0 year.

BAT : Short Term Utilization Adjustment Time (YR)

BAT represents the amount of time(number of years) necessary for a consumer to get his budget "back in line" after a price shock. It is used to lag the adjustment of the average budget(AB) in response to price changes. The default budget averaging time based on regression of 1973, 1979 energy demand "rebound" time from price shocks at a national level.(Backus, G. A., DEMAND81: National Energy Policy Model, School of Industrial Engineering, Purdue University, Reports AFC-7 through AFC-10, 1981.) The value is usually set at 2.0 but could differ by +/- 1.0 year.

BDCCU (ENDUSE, TECH,YEAR)**: Budget Rebate** ($/mBtu/YR or $/GJ/YR)

A user-specified rebate amount input used in the calculation of the marginal value of device use in the short term utilization routine in the demand sector.

BDCCU (ENDUSE, TECH,YEAR)**: Budget Rebate** ($/mBtu/YR or $/GJ/YR)

A user-specified rebate amount input used in the calculation of the marginal value of device use in the short term utilization routine in the demand sector.

BDER (ENDUSE, TECH, EC, YEAR)**: Budget Response Energy Savings** (mBtu/YR or GJ/YR)

The budget response energy savings is the energy savings that accrue as consumers adjust their energy use to realign their energy spending in their budgets. New energy requirements(less than DER) are further modified by the budget market share factor derived from this desire to control energy use to fit the budget. BDER represents the energy savings to due this budget response and is the difference between the energy requirements without it(DER) and with it. All calculations are done in the demand sectors.

BDER (ENDUSE, TECH, EC, YEAR)**: Budget Response Energy Savings** (mBtu/YR or GJ/YR)

The budget response energy savings is the energy savings that accrue as consumers adjust their energy use to realign their energy spending in their budgets. New energy requirements(less than DER) are further modified by the budget market share factor derived from this desire to control energy use to fit the budget. BDER represents the energy savings to due this budget response and is the difference between the energy requirements without it(DER) and with it. All calculations are done in the demand sectors.

BE : Budget Elasticity Factor ($/$)

The budget elasticity factor indicates the ability of an energy consumer to respond to energy price changes either by increasing or decreasing his expenditure on energy. The default value of the budget constraint is unitary elasticity. To "turn-off" the budget constraint set BE to 0.0. Other values may be used if statistical data indicates a value different from the idealized value of -1.0. When a one year DT is used the unity value corresponds to a "BE" of -0.25. This input variable resides in the data files. The budget elasticity factor is used in the calculation of the short-term price response of the consumer to changes in utility prices(UMS). Values greater than one indicate that the customer has few options and the short term price response will be small; values close to zero imply customer flexibility.

BE : Budget Elasticity Factor ($/$)

The budget elasticity factor indicates the ability of an energy consumer to respond to energy price changes either by increasing or decreasing his expenditure on energy. The default value of the budget constraint is unitary elasticity. To "turn-off" the budget constraint set BE to 0.0. Other values may be used if statistical data indicates a value different from the idealized value of -1.0. When a one year DT is used the unity value corresponds to a "BE" of -0.25. This input variable resides in the data files. The budget elasticity factor is used in the calculation of the short-term price response of the consumer to changes in utility prices(UMS). Values greater

than one indicate that the customer has few options and the short term price response will be small; values close to zero imply customer flexibility.

BM (ENDUSE, TECH, EC,YEAR)**: Budget Multiplier** ($/$)

The budget multiplier captures the energy reduction due to the budget constraint as well as any lifestyle changes voluntarily assumed or mandated. It is calculated in the demand sector as the ratio of energy required with and without the budget constraint operating, modified by "housekeeping DSM"(see below).

BM (ENDUSE, TECH, EC,YEAR)**: Budget Multiplier** ($/$)

The budget multiplier captures the energy reduction due to the budget constraint as well as any lifestyle changes voluntarily assumed or mandated. It is calculated in the demand sector as the ratio of energy required with and without the budget constraint operating, modified by "housekeeping DSM"(see below).

BMM (ENDUSE,TECH,EC)**: Budget Exogenous Multiplier Adjustment** (Btu/Btu, or J/J)

This utilization variable is what we call "housekeeping DSM"(BMM). This variable captures the effects of certain policies or habits such as bicycling to work. It is considered a policy variable that can capture mandatory operational reductions in energy use such as thermostat settings. It is a fraction reflecting the energy that remains to be satisfied. The default setting is one - no policy operating.

BMM (ENDUSE,TECH,EC)**: Budget Exogenous Multiplier Adjustment** (Btu/Btu, or J/J)

This utilization variable is what we call "housekeeping DSM"(BMM). This variable captures the effects of certain policies or habits such as bicycling to work. It is considered a policy variable that can capture mandatory operational reductions in energy use such as thermostat settings. It is a fraction reflecting the energy that remains to be satisfied. The default setting is one - no policy operating.

BMSF (ENDUSE, TECH, EC,YEAR)**: Budget Market Share Fraction by Device** ($/$)

The Budget Market Share Fraction by Device(BMSF) are the dollars spent on energy for each device for each EC and each fuel. It is derived from the marginal value of device usage which is based on fuel prices, efficiencies, capital costs and any rebates available to the consumer. Its the fraction of the budget that the consumer expects to spend for using each device and includes both a capital and a variable cost component.

BMSF (ENDUSE, TECH, EC,YEAR)**: Budget Market Share Fraction by Device** ($/$)

The Budget Market Share Fraction by Device(BMSF) are the dollars spent on energy for each device for each EC and each fuel. It is derived from the marginal value of device usage which is based on fuel prices, efficiencies, capital costs and any rebates available to the consumer. Its the

fraction of the budget that the consumer expects to spend for using each device and includes both a capital and a variable cost component.

BMSM0 (ENDUSE, TECH, EC,YEAR)**: Budget Market Share Multiplier** (Btu/Btu or J/J)

The non-price factors(BMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. BMSM0 is used in the calculation of the budget multiplier(BM) in the short term utilization procedure in the demand sector. The budget multiplier is then used in the calculation of the short term budget response(UMS).

BMSM0 (ENDUSE, TECH, EC,YEAR)**: Budget Market Share Multiplier** (Btu/Btu or J/J)

The non-price factors(BMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. BMSM0 is used in the calculation of the budget multiplier(BM) in the short term utilization procedure in the demand sector. The budget multiplier is then used in the calculation of the short term budget response(UMS).

BMSM1 (ENDUSE, TECH, EC)**: Budget Market Share Multiplier** (Btu/Btu or J/J)

The BMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The BMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. The BSMS1 is similar to the MMSM1 but is used to calculate the budget multiplier(BM) in the short term DSM utilization procedure in the demand sector. The budget multiplier is then used in the calculation of the short term budget response(UMS).

BMSM1 (ENDUSE, TECH, EC)**: Budget Market Share Multiplier** (Btu/Btu or J/J)

The BMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The BMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a

shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. The BSMS1 is similar to the MMSM1 but is used to calculate the budget multiplier(BM) in the short term DSM utilization procedure in the demand sector. The budget multiplier is then used in the calculation of the short term budget response(UMS).

BMT : Budget Multiplier Threshold (Btu/Btu or J/J)

Used, if desired, in the calculation of the marginal value of device usage in the utilization procedure in the demand sector.

BMT : Budget Multiplier Threshold (Btu/Btu or J/J)

Used, if desired, in the calculation of the marginal value of device usage in the utilization procedure in the demand sector.

BPL (ENDUSE, TECH)**: Housekeeping DSM Physical-Life** (Years)

Used in the calculation of the BCCR(budget capital charge rate). Performs the same function as DPL.

BPL (ENDUSE, TECH)**: Housekeeping DSM Physical-Life** (Years)

Used in the calculation of the BCCR(budget capital charge rate). Performs the same function as DPL.

BTL (ENDUSE, TECH)**: Housekeeping DSM Tax-Life** (Years)

Used in the calculation of the BCCR(budget capital charge rate). Performs the same function as DTL.

BTL (ENDUSE, TECH)**: Housekeeping DSM Tax-Life** (Years)

Used in the calculation of the BCCR(budget capital charge rate). Performs the same function as DTL.

BtukWh : Btu per Kilowatt hour (Btu/kWh)

Standard engineering value used for conversion.

BtukWh : Btu per Kilowatt hour (Btu/kWh)

Standard engineering value used for conversion.

BVF (ENDUSE, TECH, EC)**: Budget Variance Factor** ($/$)

This variable is calibrated and represents the deviation from "optimal" behavior in terms of consumer price responses observed through history. All variance factors in the model account for such things as time constraints, imperfect information, consumer bias, etc. that would prevent consumers from making the optimal choice based on price.

BVF (ENDUSE, TECH, EC)**: Budget Variance Factor** ($/$)

This variable is calibrated and represents the deviation from "optimal" behavior in terms of consumer price responses observed through history. All variance factors in the model account for such things as time constraints, imperfect information, consumer bias, etc. that would prevent consumers from making the optimal choice based on price.

CAPACITY (YEAR)**: Gen. Capacity w/SPP and Firm Purchases** (MW)

Total capacity is the sum of all plant capacity (GC) corrected for Winter/Summer capability (WSRATIO) plus pumped storage (PSGC), qualified facilities (QFEGC), firm purchases (FPGC) and interruptible load (ILGC).

CAPACITY (YEAR)**: Gen. Capacity w/SPP and Firm Purchases** (MW)

Total capacity is the sum of all plant capacity (GC) corrected for Winter/Summer capability (WSRATIO) plus pumped storage (PSGC), qualified facilities (QFEGC), firm purchases (FPGC) and interruptible load (ILGC).

CCSALES (CLASS,YEAR)**: Transportation Sales of Gas** (MTHERM/YR)

A model output, transportation sales of gas is the fraction of gas throughput devoted to transportation of user-owned gas through the LDC distribution system. It can be endogenously estimated of calculated using an exogenous fraction, XCCMS(exogenous market share of transportation sales).

CCSALES (CLASS,YEAR)**: Transportation Sales of Gas** (MTHERM/YR)

A model output, transportation sales of gas is the fraction of gas throughput devoted to transportation of user-owned gas through the LDC distribution system. It can be endogenously estimated of calculated using an exogenous fraction, XCCMS(exogenous market share of transportation sales).

CD (PLANT,YEAR)**: Construction Delay** (YRS)

Construction delay is exogenously specified by plant and is the length of time it takes to build a particular kind of plant.

CD (PLANT,YEAR)**: Construction Delay** (YRS)

Construction delay is exogenously specified by plant and is the length of time it takes to build a particular kind of plant.

CDUC (CLASS, LOAD,SEASON,YEAR)**: Gas Gross Load Curve** (MTHERM/DAY)

The natural gas gross load curve is calculated in the Gas Daily Use Procedure in the demand sectors from the sum of the load curves by economic class(ECDUC). It includes cogeneration and feedstock demands and temperature effects.

CDUC (CLASS, LOAD,SEASON,YEAR)**: Gas Gross Load Curve** (MTHERM/DAY)

The natural gas gross load curve is calculated in the Gas Daily Use Procedure in the demand sectors from the sum of the load curves by economic class(ECDUC). It includes cogeneration and feedstock demands and temperature effects.

CERSM (ENDUSE,EC,YEAR)**: Life Style Multiplier** (Btu/Btu or J/J)

The CERSM is a calibrated variable, specifically non-price determined. Here economy dynamics such as changes in labor force participation or a shift from occupancy in single to multi-family dwellings are captured. These changes are long term, permanent and represent a fundamental change in the underlying economic structure. CERSM modifies final demand(DMD). If the value of CERSM is close or equal to one, then no significant non-price changes have occurred during the historical period that have not been captured by the model through the other adjustment factors. If the number is greater or less than one, then more or less energy is being used per dollar of output than before. If the CERSM is growing, the reason for this growth needs to be investigated or explained

CERSM (ENDUSE,EC,YEAR)**: Life Style Multiplier** (Btu/Btu or J/J)

The CERSM is a calibrated variable, specifically non-price determined. Here economy dynamics such as changes in labor force participation or a shift from occupancy in single to multi-family dwellings are captured. These changes are long term, permanent and represent a fundamental change in the underlying economic structure. CERSM modifies final demand(DMD). If the value of CERSM is close or equal to one, then no significant non-price changes have occurred during the historical period that have not been captured by the model through the other adjustment factors. If the number is greater or less than one, then more or less energy is being used per dollar of output than before. If the CERSM is growing, the reason for this growth needs to be investigated or explained

CG (TECH,EC,YEAR)**: Cogeneration by Economic Category and Technology** (gWh/YR)

See CGEC. Cogeneration by Economic Category and Technology is CGEC split by technologies(fuels).

CG (TECH,EC,YEAR)**: Cogeneration by Economic Category and Technology** (GWH/YR)

See CGEC. Cogeneration by Economic Category and Technology is CGEC split by technologies(fuels).

CGAT :   Cogeneration Implementation Time (YRS)

Cogeneration Implementation Time input value From FOSSIL79. National data is sufficient, regional preferred. Implementation time has decreased and depends on the type of cogeneration. Input values are found in the *data files. Planned cogeneration capacity is lagged by the Cogeneration Implementation Time(CGAT) to yield the amount of cogeneration construction(CGCR) that will be undertaken. These calculations are performed in the demand sector.

CGAT :   Cogeneration Implementation Time (YRS)

Cogeneration Implementation Time input value From FOSSIL79. National data is sufficient, regional preferred. Implementation time has decreased and depends on the type of cogeneration. Input values are found in the *data files. Planned cogeneration capacity is lagged by the Cogeneration Implementation Time(CGAT) to yield the amount of cogeneration construction(CGCR) that will be undertaken. These calculations are performed in the demand sector.

CGBL :   Cogeneration Equipment Book Value Lifetime (YRS)

Book value plant life time of cogenerator. From GBA hand written notes of 8/27/88.

CGBL :   Cogeneration Equipment Book Value Lifetime (YRS)

Book value plant life time of cogenerator. From GBA hand written notes of 8/27/88.

CGCC (TECH,EC)**:   Cogeneration Capital Cost** ($/mBtu/YR or $/GJ/YR)

The cogeneration capital costs include the normal costs for cogeneration(CGCCI) plus a factor to account for depletion of certain cogeneration resources. These capital costs are annualized and used to calculate the cogeneration marginal cost of energy(CGMCE). All calculations are in the demand sector.

CGCC (TECH,EC)**:   Cogeneration Capital Cost** ($/mBtu/YR or $/GJ/YR)

The cogeneration capital costs include the normal costs for cogeneration(CGCCI) plus a factor to account for depletion of certain cogeneration resources. These capital costs are annualized and used to calculate the cogeneration marginal cost of energy(CGMCE). All calculations are in the demand sector.

CGCR (TECH,EC,YEAR)**:   Cogeneration Capacity Construction Rate** (MW/YR)

Actual cogeneration construction(CGCR) depends on planned cogeneration capacity(CGICG) which in turn is a function of cogeneration potential(CGPOT). The fraction of cogeneration potential(CGPOT) that is actually developed is determined by the Fraction of Potential Development(CGMSF). This fraction depends on the marginal cost of cogeneration(CGMCE), the price of electricity to cogenerators(CGFP) and cogeneration non-price factors(CGMSM0). In a sense, this fraction is a market share choice between two options - self-generation and purchases from a utility. The choice is based on the relative prices of the two options plus non-price factors such as willingness to undertake such a project. The CGCR represents additions to existing cogeneration stock and is used to modify CGGC(cogeneration generation capacity).

CGCR (TECH,EC,YEAR)**: Cogeneration Capacity Construction Rate** (MW/YR)

Actual cogeneration construction(CGCR) depends on planned cogeneration capacity(CGICG) which in turn is a function of cogeneration potential(CGPOT). The fraction of cogeneration potential(CGPOT) that is actually developed is determined by the Fraction of Potential Development(CGMSF). This fraction depends on the marginal cost of cogeneration(CGMCE), the price of electricity to cogenerators(CGFP) and cogeneration non-price factors(CGMSM0). In a sense, this fraction is a market share choice between two options - self-generation and purchases from a utility. The choice is based on the relative prices of the two options plus non-price factors such as willingness to undertake such a project. The CGCR represents additions to existing cogeneration stock and is used to modify CGGC(cogeneration generation capacity).

CGCUF (TECH,EC,YEAR)**: Cogeneration Capacity Utilization Factor** (($/YR)/($/YR))

Cogeneration Capacity Utilization Factor(CGCUF) is a calibrated variable that captures any other variations affecting CGEC(cogeneration generation) not picked up by WCUF.

CGCUF (TECH,EC,YEAR)**: Cogeneration Capacity Utilization Factor** (($/YR)/($/YR))

Cogeneration Capacity Utilization Factor(CGCUF) is a calibrated variable that captures any other variations affecting CGEC(cogeneration generation) not picked up by WCUF.

CGCUFP (TECH,EC,YEAR)**: Normal Cogeneration Capacity Utilization Factor** (Btu/Btu or J/J)

The Cogeneration Normal Capacity Utilization Factor(CGCUFP) is a fraction, less than one, that indicates normal usage of a cogeneration facility. Non-economy related changes(which would be picked up in WCUF) are reflected here. It is used to modify CGEC. All calculations are found in the demand sector.

CGCUFP (TECH,EC,YEAR)**: Normal Cogeneration Capacity Utilization Factor** (Btu/Btu or J/J)

The Cogeneration Normal Capacity Utilization Factor(CGCUFP) is a fraction, less than one, that indicates normal usage of a cogeneration facility. Non-economy related changes(which would

be picked up in WCUF) are reflected here. It is used to modify CGEC. All calculations are found in the demand sector.

CGDC (TECH)**: Cogeneration Delivery Charge** ($/mBtu OR $/GJ)

Values for CGDC are site specific. The input values reside in the *data files. CGDC can be included in the demand sector calculation of cogeneration variable cost.

CGDC (TECH)**: Cogeneration Delivery Charge** ($/mBtu OR $/GJ)

Values for CGDC are site specific. The input values reside in the *data files. CGDC can be included in the demand sector calculation of cogeneration variable cost.

CGDM (TECH,YEAR)**: Cogeneration Depletion Multiplier** (DLESS)

The Cogeneration Depletion Multiplier(CGDM) is calculated by assessing the cogeneration potential(CGRESI) and subtracting from it the existing cogeneration capacity(CGGC). For some technologies, costs increase as more cogeneration is developed. For example, hydropower cogeneration tends to be more expensive at later installations than the first because the cheapest(best flow, most accessible) sites are developed first. For technologies that experience this type of cost increase with subsequent installation, the CGDM tracks these increasing costs. CGDM is used to determine cogeneration capital costs(CGCC).

CGDM (TECH,YEAR)**: Cogeneration Depletion Multiplier** (DLESS)

The Cogeneration Depletion Multiplier(CGDM) is calculated by assessing the cogeneration potential(CGRESI) and subtracting from it the existing cogeneration capacity(CGGC). For some technologies, costs increase as more cogeneration is developed. For example, hydropower cogeneration tends to be more expensive at later installations than the first because the cheapest(best flow, most accessible) sites are developed first. For technologies that experience this type of cost increase with subsequent installation, the CGDM tracks these increasing costs. CGDM is used to determine cogeneration capital costs(CGCC).

CGDMD (TECH,EC,YEAR)**: Cogeneration Energy Demand** (tBtu/YR OR GJ/YR)

Cogeneration Energy Demand(CGDMD) is the Cogeneration Generation(CGEC) when multiplied by the Cogeneration Heat Rate(CGHRT) and is added to final net electric demand(ECD). The calculations are performed in the demand sector.

CGDMD (TECH,EC,YEAR)**: Cogeneration Energy Demand** (tBtu/YR OR GJ/YR)

Cogeneration Energy Demand(CGDMD) is the Cogeneration Generation(CGEC) when multiplied by the Cogeneration Heat Rate(CGHRT) and is added to final net electric demand(ECD). The calculations are performed in the demand sector.

CGDMSW (TECH)**: Depletion Multiplier Switch for Selecting Technology**

If the depletion of the cogeneration resource is a consideration(such as biomass), this switch is set to one and "turns-on" the equation for the cogeneration depletion multiplier(CGDM). If resource depletion is not a concern, the switch is set to zero in the data files.

CGDMSW (TECH)**: Depletion Multiplier Switch for Selecting Technology**

If the depletion of the cogeneration resource is a consideration(such as biomass), this switch is set to one and "turns-on" the equation for the cogeneration depletion multiplier(CGDM). If resource depletion is not a concern, the switch is set to zero in the data files.

CGEC (EC,YEAR)**: Cogeneration by Economic Category** (GWH/YR)

Cogeneration Generation(CGEC), the amount of generation from cogenerating facilities, depends on five factors: the Cogeneration Normal Capacity Utilization Factor(CGCUFP), the Cogeneration Utilization Factor(CGUMS), Cogeneration Capacity(CGGC), the Cogeneration Capacity Utilization Factor(CGCUF) and the Economic Capacity Utilization Factor(WCUF or ECUF). The utilization factors perform the same functions as their counterparts that modify demand. Cogeneration Generation(CGEC) is accounted for in two ways. First the electricity generated is tracked in kWh by a variable called Cogeneration Electricity Generated(CGkWh). It is also, when multiplied by the Cogeneration Heat Rate(CGHRT), tracked by a variable called Cogeneration Energy Demands(CGDMD) and is added to final net electric demand(ECD). ECD is electric DMD minus the energy needed to cogenerate. ECD is very close to electric sales.

CGEC (EC,YEAR)**: Cogeneration by Economic Category** (gWh/YR)

Cogeneration Generation(CGEC), the amount of generation from cogenerating facilities, depends on five factors: the Cogeneration Normal Capacity Utilization Factor(CGCUFP), the Cogeneration Utilization Factor(CGUMS), Cogeneration Capacity(CGGC), the Cogeneration Capacity Utilization Factor(CGCUF) and the Economic Capacity Utilization Factor(WCUF or ECUF). The utilization factors perform the same functions as their counterparts that modify demand. Cogeneration Generation(CGEC) is accounted for in two ways. First the electricity generated is tracked in kWh by a variable called Cogeneration Electricity Generated(CGkWh). It is also, when multiplied by the Cogeneration Heat Rate(CGHRT), tracked by a variable called Cogeneration Energy Demands(CGDMD) and is added to final net electric demand(ECD). ECD is electric DMD minus the energy needed to cogenerate. ECD is very close to electric sales.

CGFP (TECH,EC,YEAR)**: Electric Price** ($/mBtu OR $/GJ)

CGFP(cogeneration fuel price) is the fuel price(FP) multiplied by sales tax. It is used in the determination of the cogeneration market share. These calculations are in the demand sector.

CGFP (TECH,EC,YEAR)**: Electric Price** ($/mBtu OR $/GJ)

CGFP(cogeneration fuel price) is the fuel price(FP) multiplied by sales tax. It is used in the determination of the cogeneration market share. These calculations are in the demand sector.

CGFP0 (TECH,EC,YEAR)**:** **Electric Price** ($/mBtu OR $/GJ)

CGFP(cogeneration fuel price) is the fuel price(FP) multiplied by sales tax. It is used in the determination of the cogeneration market share. These calculations are in the demand sector.

CGFP0 (TECH,EC,YEAR)**:** **Electric Price** ($/mBtu OR $/GJ)

CGFP(cogeneration fuel price) is the fuel price(FP) multiplied by sales tax. It is used in the determination of the cogeneration market share. These calculations are in the demand sector.

CGGC (TECH,EC,YEAR)**:** **Cogeneration Generation Capacity** (MW)

Existing cogeneration generation capacity(CGGC) is the current stock of cogeneration capacity available. Modifying the stock of cogeneration capacity are cogeneration construction rate and retirements variables(additions to and subtractions from the stock of cogeneration on a yearly basis.)

CGGC (TECH,EC,YEAR)**:** **Cogeneration Generation Capacity** (MW)

Existing cogeneration generation capacity(CGGC) is the current stock of cogeneration capacity available. Modifying the stock of cogeneration capacity are cogeneration construction rate and retirements variables(additions to and subtractions from the stock of cogeneration on a yearly basis.)

CGHRT (TECH)**:** **Cogeneration Heat Rate** (Btu/kWh or J/kWh)

A standard conversion factor converting Btus or Js to kWh. Data values are found in the *data files; the variable is used in many cogeneration equations including final cogeneration demand(CGDMD), cogeneration pollution(CGPOL), and cogeneration variable cost(CGVC).

CGHRT (TECH)**:** **Cogeneration Heat Rate** (Btu/kWh or J/kWh)

A standard conversion factor converting Btus or Js to kWh. Data values are found in the *data files; the variable is used in many cogeneration equations including final cogeneration demand(CGDMD), cogeneration pollution(CGPOL), and cogeneration variable cost(CGVC).

CGIGC (TECH,EC)**:** **Cogeneration Indicated Generation Capacity** (MW)

The Planned Cogeneration Capacity(CGIGC) is derived by applying the Fraction of Potential Development(CGMSF) to the Cogeneration Potential(CGPOT). The cogeneration potential(CGPOT) is determined by the process heat requirements(DER) and the cogeneration heat rate(CGHRT). Potentially all of these requirements could be met by cogeneration however, through the CGMSF, relative prices, and non-price factors reduce the potential to the more economically realistic planned cogeneration capacity(CGIGC). The planned cogeneration capacity, additionally influenced by current cogeneration capacity(existing cogeneration would not be duplicated) as well as capacity retirements, is lagged by the Cogeneration Implementation Time(CGAT) to yield the amount of cogeneration construction(CGCR) that will be undertaken. These calculations are performed in the demand sector.

CGIGC (TECH,EC)**: Cogeneration Indicated Generation Capacity** (MW)

The Planned Cogeneration Capacity(CGIGC) is derived by applying the Fraction of Potential Development(CGMSF) to the Cogeneration Potential(CGPOT). The cogeneration potential(CGPOT) is determined by the process heat requirements(DER) and the cogeneration heat rate(CGHRT). Potentially all of these requirements could be met by cogeneration however, through the CGMSF, relative prices, and non-price factors reduce the potential to the more economically realistic planned cogeneration capacity(CGIGC). The planned cogeneration capacity, additionally influenced by current cogeneration capacity(existing cogeneration would not be duplicated) as well as capacity retirements, is lagged by the Cogeneration Implementation Time(CGAT) to yield the amount of cogeneration construction(CGCR) that will be undertaken. These calculations are performed in the demand sector.

CGIVTC (YEAR)**: Cogeneration Investment Tax Credit** ($/$)

Cogeneration Investment Tax Credits can come from state or national government programs. CGIVTC modifies the cogeneration capital charge rate(CGCCR) in the demand sector, reducing the cost of cogeneration development. Currently no federal tax credits are offered.

CGIVTC (YEAR)**: Cogeneration Investment Tax Credit** ($/$)

Cogeneration Investment Tax Credits can come from state or national government programs. CGIVTC modifies the cogeneration capital charge rate(CGCCR) in the demand sector, reducing the cost of cogeneration development. Currently no federal tax credits are offered.

CGLOAD (TECH)**: Cogeneration Demand Load to ECD**

CGLOAD is the fraction of cogeneration demand load that contributes to final demand. The default value is 1 implying that all cogeneration demand is counted in final demand. The input data is found in the data files and the equation for ECD is in the demand sector.

CGLOAD (TECH)**: Cogeneration Demand Load to ECD**

CGLOAD is the fraction of cogeneration demand load that contributes to final demand. The default value is 1 implying that all cogeneration demand is counted in final demand. The input data is found in the data files and the equation for ECD is in the demand sector.

CGMAP (TECH,EC,YEAR)**: Map for Cogeneration Loadshapes**

CGMAP (TECH,EC,YEAR)**: Map for Cogeneration Loadshapes**

CGMCE (TECH,EC,YEAR)**: Cogeneration Marginal Cost of Energy** ($/mBtu OR $/GJ)

Cogeneration marginal cost(CGMCE) is determined by the cogeneration capital charge rate(CGCCR), cogeneration capital cost(CGCC) and cogeneration variable cost(CGVC). Cogeneration capital cost is multiplied by the cogeneration capital charge rate to get an levelized capital cost. The derivation of the capital charge rate is similar to the rate used in the utility sector of the model. A cogeneration variable cost is calculated and added to the levelized fixed cost yielding the cost of cogeneration at the margin. These calculations are performed in the demand sector. CGMCE is used to determine the cogeneration market allocation weight which determines the share of the market served by cogeneration(by fuel type).

CGMCE (TECH,EC,YEAR)**: Cogeneration Marginal Cost of Energy** ($/mBtu OR $/GJ)

Cogeneration marginal cost(CGMCE) is determined by the cogeneration capital charge rate(CGCCR), cogeneration capital cost(CGCC) and cogeneration variable cost(CGVC). Cogeneration capital cost is multiplied by the cogeneration capital charge rate to get an levelized capital cost. The derivation of the capital charge rate is similar to the rate used in the utility sector of the model. A cogeneration variable cost is calculated and added to the levelized fixed cost yielding the cost of cogeneration at the margin. These calculations are performed in the demand sector. CGMCE is used to determine the cogeneration market allocation weight which determines the share of the market served by cogeneration(by fuel type).

CGMCE0 (TECH,EC,FIRST)**: Cogeneration Marginal Cost of Energy** ($/mBtu OR $/GJ)

Cogeneration marginal cost(CGMCE) is determined by the cogeneration capital charge rate(CGCCR), cogeneration capital cost(CGCC) and cogeneration variable cost(CGVC). Cogeneration capital cost is multiplied by the cogeneration capital charge rate to get an levelized capital cost. The derivation of the capital charge rate is similar to the rate used in the utility sector of the model. A cogeneration variable cost is calculated and added to the levelized fixed cost yielding the cost of cogeneration at the margin. These calculations are performed in the demand sector. CGMCE is used to determine the cogeneration market allocation weight which determines the share of the market served by cogeneration(by fuel type).

CGMCE0 (TECH,EC,FIRST)**: Cogeneration Marginal Cost of Energy** ($/mBtu OR $/GJ)

Cogeneration marginal cost(CGMCE) is determined by the cogeneration capital charge rate(CGCCR), cogeneration capital cost(CGCC) and cogeneration variable cost(CGVC). Cogeneration capital cost is multiplied by the cogeneration capital charge rate to get an levelized capital cost. The derivation of the capital charge rate is similar to the rate used in the utility sector of the model. A cogeneration variable cost is calculated and added to the levelized fixed cost yielding the cost of cogeneration at the margin. These calculations are performed in the demand sector. CGMCE is used to determine the cogeneration market allocation weight which determines the share of the market served by cogeneration(by fuel type).

CGMSF (TECH,EC,YEAR)**: Fraction of Potential Cogeneration Development** ($/$)

The fraction of cogeneration potential(CGPOT) that is actually developed is determined by the Fraction of Potential Development(CGMSF). This fraction depends on the marginal cost of cogeneration(CGMCE), the price of electricity to cogenerators(CGFP) and cogeneration non-price factors(CGMSM0). All calculations are found in the demand sector.

CGMSF (TECH,EC,YEAR)**: Fraction of Potential Cogeneration Development** ($/$)

The fraction of cogeneration potential(CGPOT) that is actually developed is determined by the Fraction of Potential Development(CGMSF). This fraction depends on the marginal cost of cogeneration(CGMCE), the price of electricity to cogenerators(CGFP) and cogeneration non-price factors(CGMSM0). All calculations are found in the demand sector.

CGMSM0 (TECH,EC,YEAR)**: Cogeneration Non-Price Factors** ($/$)

The GCMSM0 is calibrated in the same manner as other non-price factors - by looking at the historical market shares and prices and calculating the deviation from the economically optimal split. It is used to determine the cogeneration capacity construction rate in the demand sector.

CGMSM0 (TECH,EC,YEAR)**: Cogeneration Non-Price Factors** ($/$)

The GCMSM0 is calibrated in the same manner as other non-price factors - by looking at the historical market shares and prices and calculating the deviation from the economically optimal split. It is used to determine the cogeneration capacity construction rate in the demand sector.

CGMSMI (TECH,EC)**: Cogeneration Market Share Multiplier** ($/$)

The CGMSMI is a calibrated variable used in the cogeneration market share equation in the demand sector.

CGMSMI (TECH,EC)**: Cogeneration Market Share Multiplier** ($/$)

The CGMSMI is a calibrated variable used in the cogeneration market share equation in the demand sector.

CGMSMM (TECH,EC,YEAR)**: Cogeneration Market Share Multiplier Policy** ($/$)

This is a policy variable used to alter the cogeneration market share equation in the demand sector. The default value in the *data files is set equal to one(no effect).

CGMSMM (TECH,EC,YEAR)**: Cogeneration Market Share Multiplier Policy** ($/$)

This is a policy variable used to alter the cogeneration market share equation in the demand sector. The default value in the *data files is set equal to one(no effect).

CGOF (TECH,EC)**: Cogeneration Operation Cost Fraction** (($/YR)/$)

Currently, national default data is in the * data file however, more site specific data is preferred. It is assumed that operating costs are some constant fraction of capital costs, therefore CGOF is multiplied times the cogeneration capital cost to get operating costs. The variable is used in the cogeneration variable cost calculation in the demand sector.

CGOF (TECH,EC)**: Cogeneration Operation Cost Fraction** (($/YR)/$)

Currently, national default data is in the * data file however, more site specific data is preferred. It is assumed that operating costs are some constant fraction of capital costs, therefore CGOF is multiplied times the cogeneration capital cost to get operating costs. The variable is used in the cogeneration variable cost calculation in the demand sector.

CGPL (TECH,EC)**: Cogeneration Physical Lifetime** (YRS)

Default national data in the *data files is from ARC80; more specific data is preferred. CGPL is used to determine the cogeneration retirement rate(dividing the cogeneration capacity by the CGPL yields yearly retirements).

CGPL (TECH,EC)**: Cogeneration Physical Lifetime** (YRS)

Default national data in the *data files is from ARC80; more specific data is preferred. CGPL is used to determine the cogeneration retirement rate(dividing the cogeneration capacity by the CGPL yields yearly retirements).

CGPOCA (TECH,EC,POLL,YEAR)**: Cogeneration Average Pollution Coefficient** (TONS/tBtu or TONS/PJ)

The cogeneration average pollution coefficient is calculated in the demand sector from embodied pollution divided by the tBtuS of cogeneration generation.

CGPOCA (TECH,EC,POLL,YEAR)**: Cogeneration Average Pollution Coefficient** (TONS/tBtu or TONS/PJ)

The cogeneration average pollution coefficient is calculated in the demand sector from embodied pollution divided by the tBtuS of cogeneration generation.

CGPOCS (TECH,EC,POLL,YEAR)**: Cogeneration Pollution Standards**

Any existing pollution standards set specifically for cogeneration are included in this variable dimensioned by fuel, pollution type and economic class. Currently there are no standards in place. Standards are written in *data files and are used in calculating total cogeneration pollution in the demand sectors.

CGPOCS (TECH,EC,POLL,YEAR)**: Cogeneration Pollution Standards**

Any existing pollution standards set specifically for cogeneration are included in this variable dimensioned by fuel, pollution type and economic class. Currently there are no standards in place. Standards are written in *data files and are used in calculating total cogeneration pollution in the demand sectors.

CGPOCX (TECH,EC,POLL,YEAR)**: Cogeneration Pollution Coefficient** (TONS/tBtu or TONS/PJ)

Cogeneration Pollution coefficients are calculated as a fraction(PCFR) of the Industrial Pollution coefficients(POCX) which are found in the idata file. The default fraction is based on data from the Vermont Hydro Quebec hearings. This data can be replaced when better data is available. An assumption made is that lower burning temperatures with cogeneration cause lower NO2 emissions but cause much higher VOC and CO emissions. CGPOCX is used in the pollution from new sources calculation(CGPOEA) in the demand sector.

CGPOCX (TECH,EC,POLL,YEAR)**: Cogeneration Pollution Coefficient** (TONS/tBtu or TONS/PJ)

Cogeneration Pollution coefficients are calculated as a fraction(PCFR) of the Industrial Pollution coefficients(POCX) which are found in the idata file. The default fraction is based on data from the Vermont Hydro Quebec hearings. This data can be replaced when better data is available. An assumption made is that lower burning temperatures with cogeneration cause lower NO2 emissions but cause much higher VOC and CO emissions. CGPOCX is used in the pollution from new sources calculation(CGPOEA) in the demand sector.

CGPOE (TECH,EC,POLL,YEAR)**: Cogeneration Embodied Pollution**

CGPOE is the existing level of pollution modified by new pollution from cogeneration additions and reduced pollution from retirements. CGPOE is used to calculate average pollution. All calculations are found in the demand sector.

CGPOE (TECH,EC,POLL,YEAR)**: Cogeneration Embodied Pollution**

CGPOE is the existing level of pollution modified by new pollution from cogeneration additions and reduced pollution from retirements. CGPOE is used to calculate average pollution. All calculations are found in the demand sector.

CGPOL (TECH,POLL,YEAR)**: Cogeneration Pollution** (TONS/YR)

Total Cogeneration Pollution is calculated in the demand sector from the cogeneration demand(CGDMD) multiplied by the average pollution per tBtu.(CGPOCA). It is added to the total energy sector pollution(TFPOL).

CGPOL (TECH,POLL,YEAR)**: Cogeneration Pollution** (TONS/YR)

Total Cogeneration Pollution is calculated in the demand sector from the cogeneration demand(CGDMD) multiplied by the average pollution per tBtu.(CGPOCA). It is added to the total energy sector pollution(TFPOL).

CGPOT (TECH,EC,YEAR)**: Cogeneration Potential** (MW)

CGPOT(cogeneration potential) is the total device energy required divided by the heat rate. All energy requirements could possibly be served by cogeneration. Actual cogeneration construction(CGCR) depends on planned cogeneration capacity(CGICG) which in turn is a fraction of the cogeneration potential(CGPOT). This fraction depends on the marginal cost of cogeneration(CGMCE), the price of electricity to cogenerators(CGFP) and cogeneration non-price factors(CGMSM0). All calculations are performed in the demand sector.

CGPOT (TECH,EC,YEAR)**: Cogeneration Potential** (MW)

CGPOT(cogeneration potential) is the total device energy required divided by the heat rate. All energy requirements could possibly be served by cogeneration.Actual construction(CGCR) depends on planned cogeneration capacity(CGICG) which in turn is a fraction of the cogeneration potential(CGPOT). This fraction depends on the marginal cost of cogeneration(CGMCE), the price of electricity to cogenerators(CGFP) and cogeneration non-price factors(CGMSM0). All calculations are performed in the demand sector.

CGR (TECH,EC,YEAR)**: Cogeneration Capacity Retirements** (MW/YR)

Cogeneration retirements are simply a function of the physical lifetime of cogeneration and are calculated in the demand sector. CGR modifies the stock of cogeneration capacity(CGGC).

CGR (TECH,EC,YEAR)**: Cogeneration Capacity Retirements** (MW/YR)

Cogeneration retirements are simply a function of the physical lifetime of cogeneration and are calculated in the demand sector. CGR modifies the stock of cogeneration capacity(CGGC).

CGRESI (TECH)**: Resource Base** (mBtu or GJ)

CGRESI is the total resource base available for a particular depletable resource and is used when calculating the cogeneration depletion multiplier.

CGRESI (TECH)**: Resource Base** (mBtu or GJ)

CGRESI is the total resource base available for a particular depletable resource and is used when calculating the cogeneration depletion multiplier.

CGRISK (TECH)**: Cogeneration Excess Risk** (DLESS)

Cogeneration risk(CGRISK) is standard DOE risk value and is found in the *data files. It is used in the calculation of the cogeneration device capital charge rate(CGCCR) found in the demand sector.

CGRISK (TECH)**:   Cogeneration Excess Risk** (DLESS)

Cogeneration risk(CGRISK) is standard DOE risk value and is found in the *data files. It is used in the calculation of the cogeneration device capital charge rate(CGCCR) found in the demand sector.

CGSCM (TECH)**:   Cogeneration Shared Cost Multiplier** ($/$)

This variable represents the amount of cost that can be shared between the cogeneration facility and the production facility. More generally, it represents any other financial benefits to the industrial firm from cogenerating. Default national data is used. Site specific data is preferred. This variable is found in the CGUMS(cogeneration utilization multiplier) equation found in the demand sector.

CGSCM (TECH)**:   Cogeneration Shared Cost Multiplier** ($/$)

This variable represents the amount of cost that can be shared between the cogeneration facility and the production facility. More generally, it represents any other financial benefits to the industrial firm from cogenerating. Default national data is used. Site specific data is preferred. This variable is found in the CGUMS(cogeneration utilization multiplier) equation found in the demand sector.

CGTL :   Cogeneration Tax Life (YR)

Cogeneration tax life is a normal accounting value and is some fraction of plant life. The input value resides in the data files and it is used in the calculation in the demand sector of CGCCR(cogeneration capital charge rate).

CGTL :   Cogeneration Tax Life (YR)

Cogeneration tax life is a normal accounting value and is some fraction of plant life. The input value resides in the data files and it is used in the calculation in the demand sector of CGCCR(cogeneration capital charge rate).

CGUMS (TECH,EC,YEAR)**:   Cogeneration Utilization Multiplier** (Btu/Btu or J/J)

The Cogeneration Utilization Factor(CGUMS) depends upon the Indicated Cogeneration Utilization Factor(CGRATIO). This ratio is derived from a comparison between the current price of electricity to cogenerators(CGFP) and cogeneration variable costs(CGVC) modified by the cogeneration shared cost multiplier(CGSCM) which reflects any other financial benefits to the industrial from cogenerating. It determines the desirability of cogenerating from existing facilities based on relative prices. For example, if the electric utility lowers its price to cogenerators(CGFP) then cogeneration becomes less attractive. The ratio becomes the utilization factor after a lag representing time to adjust to new circumstances(in this case, the growing attractiveness of utility-generated power) and implementation time called the Cogeneration Adjustment Time(CGAT). CGUMS influences Cogeneration Generation(CGEG). All variable calculations are found in the demand sector.

CGUMS (TECH,EC,YEAR)**: Cogeneration Utilization Multiplier** (Btu/Btu or J/J)

The Cogeneration Utilization Factor(CGUMS) depends upon the Indicated Cogeneration Utilization Factor(CGRATIO). This ratio is derived from a comparison between the current price of electricity to cogenerators(CGFP) and cogeneration variable costs(CGVC) modified by the cogeneration shared cost multiplier(CGSCM) which reflects any other financial benefits to the industrial from cogenerating. It determines the desirability of cogenerating from existing facilities based on relative prices. For example, if the electric utility lowers its price to cogenerators(CGFP) then cogeneration becomes less attractive. The ratio becomes the utilization factor after a lag representing time to adjust to new circumstances(in this case, the growing attractiveness of utility-generated power) and implementation time called the Cogeneration Adjustment Time(CGAT). CGUMS influences Cogeneration Generation(CGEG). All variable calculations are found in the demand sector.

CGVC (TECH,EC,YEAR)**: Cogeneration Variable Costs** ($/mBtu OR $/GJ)

The cogeneration variable cost component of marginal cost(CGVC) is made up of four factors: fuel prices, heat rates, delivery charges, and operating costs. Fuel prices refer to the fuel used in the boilers, the heat rate is the efficiency of the boilers, the operating costs consider operating costs associated with the cogeneration alone, and the delivery prices include such miscellaneous costs as electric back service charges. There is also a cogeneration fuel cost switch which may be turned off if there is no fuel cost such as is the case with hydropower cogeneration.

CGVC (TECH,EC,YEAR)**: Cogeneration Variable Costs** ($/mBtu OR $/GJ)

The cogeneration variable cost component of marginal cost(CGVC) is made up of four factors: fuel prices, heat rates, delivery charges, and operating costs. Fuel prices refer to the fuel used in the boilers, the heat rate is the efficiency of the boilers, the operating costs consider operating costs associated with the cogeneration alone, and the delivery prices include such miscellaneous costs as electric back service charges. There is also a cogeneration fuel cost switch which may be turned off if there is no fuel cost such as is the case with hydropower cogeneration.

CGVCSW (TECH)**: Cogeneration Variable Costs Switch for Selecting TECH**

This switch allows a fuel price calculation in the cogeneration variable cost calculation. The switch is set equal to one in the data files for non-electric technologies.

CGVCSW (TECH)**: Cogeneration Variable Costs Switch for Selecting TECH**

This switch allows a fuel price calculation in the cogeneration variable cost calculation. The switch is set equal to one in the data files for non-electric technologies.

CGVF (TECH,EC)**: Cogeneration Variance Factor** ($/$)

This is a calibrated variable used in the calculation of the cogeneration market shares in the demand sector.

CGVF (TECH,EC)**: Cogeneration Variance Factor** ($/$)

This is a calibrated variable used in the calculation of the cogeneration market shares in the demand sector.

CHR (TECH,EC,YEAR)**: Cooling to Heating Ratio** (Btu/Btu or J/J)

The air conditioning process efficiency(PEE(AC)) is based on the space heating process efficiency(PEE(HEAT)), the heating-to-cooling ratio(CHR), the heating-to-cooling ratio multiplier(CHRM), and the process efficiency multiplier(PEMM). The CHR provides the basic conversion between heating and cooling process efficiency. The variable can be a calibrated variable or the default value of one can be used.

CHR (TECH,EC,YEAR)**: Cooling to Heating Ratio** (Btu/Btu or J/J)

The air conditioning process efficiency(PEE(AC)) is based on the space heating process efficiency(PEE(HEAT)), the heating-to-cooling ratio(CHR), the heating-to-cooling ratio multiplier(CHRM), and the process efficiency multiplier(PEMM). The CHR provides the basic conversion between heating and cooling process efficiency. The variable can be a calibrated variable or the default value of one can be used.

CHRM (EC,YEAR)**: Cooling to Heating Ratio Multiplier**

A multiplier used to adjust the cooling to heating ratio in the future if the user has reason to believe this ratio will change from historical values. Default value is one.

CHRM (EC,YEAR)**: Cooling to Heating Ratio Multiplier**

A multiplier used to adjust the cooling to heating ratio in the future if the user has reason to believe this ratio will change from historical values. Default value is one.

CIF (ENDUSE,CENDUSE,TECH,EC)**: Cross-Impact Factor** (Btu/Btu or J/J)

Inter-End-Use Cross Impact factor accounts for increases in AC and reductions in heating loads as other end use energy use is increased(for example, lighting). ENERGY 2020 assumes the marginal cost of fuel use is the primary decision tool and determines building characteristics. Cross-impacts then affect size(volume) needs by modifying the energy intensity multiplier that in turns modifies the process efficiency.

CIF (ENDUSE,CENDUSE,TECH,EC)**: Cross-Impact Factor** (Btu/Btu or J/J)

Inter-End-Use Cross Impact factor accounts for increases in AC and reductions in heating loads as other end use energy use is increased(for example, lighting). ENERGY 2020 assumes the marginal cost of fuel use is the primary decision tool and determines building characteristics. Cross-impacts then affect size(volume) needs by modifying the energy intensity multiplier that in turns modifies the process efficiency.

CLDC (CLASS,LOAD,SEASON,YEAR)**: Load Curve by Revenue Class** (MW)

The CLDC is computed in the demand sector as the sum over enduse and economic class of the ECLDC(economic class load duration curve). The CLDC is used to compute the sales by class which are the average CLDC summed over hours.

CLDC (CLASS,LOAD,SEASON,YEAR)**: Load Curve by Revenue Class** (MW)

The CLDC is computed in the demand sector as the sum over enduse and economic class of the ECLDC(economic class load duration curve). The CLDC is used to compute the sales by class which are the average CLDC summed over hours.

CLTC (YEAR)**: Claimed Investment Tax Credit** (M$/YR)

The utility can claim 85% of its income tax obligation before credits or the level of accumulated credits, whichever is less.

CLTC (YEAR)**: Claimed Investment Tax Credit** (M$/YR)

The utility can claim 85% of its income tax obligation before credits or the level of accumulated credits, whichever is less.

CMSF (ENDUSE,TECH,CTECH,EC)**: Conversion Market Share Fraction by Device** ($/$)

The Conversion Market Share Fractions(CMSF) are calculated in the same fashion as the market share fractions(MMSF), as a function of both price and non-price factors. The price factors are the cost of using fuel(MCFU), the marginal process efficiency(PEE) and the process capital cost(PCC). In addition, a rebate is now included in the equation. The same non-price factors(MSMM) are considered as in MMSF. The calculation of CMSF is performed in the demand sector and it is used to split the PCAs(production capacity additions) to derive the EUPCAs(production capacity additions by enduse) when rebates are offered. It is used to calculate Energy Conversion Additions(DERC) in the demand sector. A comparison can be made between market shares with and without rebates.

CMSF (ENDUSE,TECH,CTECH,EC)**: Conversion Market Share Fraction by Device** ($/$)

The Conversion Market Share Fractions(CMSF) are calculated in the same fashion as the market share fractions(MMSF), as a function of both price and non-price factors. The price factors are the cost of using fuel(MCFU), the marginal process efficiency(PEE) and the process capital cost(PCC). In addition, a rebate is now included in the equation. The same non-price factors(MSMM) are considered as in MMSF. The calculation of CMSF is performed in the demand sector and it is used to split the PCAs(production capacity additions) to derive the EUPCAs(production capacity additions by enduse) when rebates are offered. It is used to calculate Energy Conversion Additions(DERC) in the demand sector. A comparison can be made between market shares with and without rebates.

CMSM0 (TECH,CTECH,EC,YEAR)**: Conversion Market Share Multiplier** ($/$)

The non-price factors(CMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. CMSM0 is similar to MMSM0 and is used to modify the conversion market allocation weight which is used to determine the conversion market share for each fuel in the conversion procedure in the demand sector.

CMSM0 (TECH,CTECH,EC,YEAR)**: Conversion Market Share Multiplier** ($/$)

The non-price factors(CMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. CMSM0 is similar to MMSM0 and is used to modify the conversion market allocation weight which is used to determine the conversion market share for each fuel in the conversion procedure in the demand sector.

CMSMI (ENDUSE,TECH,CTECH,EC)**: Conversion Market Share Multiplier** ($/$)

The CMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)) used to calculate the conversion market share allocation weight. Similar to MMSM1, CMSMI is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. This is a calibrated variable used in the conversion procedure in the demand sector.

CMSMI (ENDUSE,TECH,CTECH,EC)**: Conversion Market Share Multiplier** ($/$)

The CMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)) used to calculate the conversion market share allocation weight. Similar to MMSM1, CMSMI is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. This is a calibrated variable used in the conversion procedure in the demand sector.

CNVRTEU (ENDUSE)**: Conversion Switch**

This switch turns on the device conversion routines(either endogenous or exogenous) in the model. If CNVRTEU is set equal to NONEXIST, then the conversion routines are not called.

CNVRTEU (ENDUSE)**: Conversion Switch**

This switch turns on the device conversion routines(either endogenous or exogenous) in the model. If CNVRTEU is set equal to NONEXIST, then the conversion routines are not called.

CONADM (SECTOR,YEAR)**: Conservation Administration Costs** (M$/YEAR)

Calculated in the demand sectors and used in the total operation and maintenance cost equation.

CONADM (SECTOR,YEAR)**: Conservation Administration Costs** (M$/YEAR)

Calculated in the demand sectors and used in the total operation and maintenance cost equation.

CONADM (SECTOR,FUEL,YEAR)**: Conservation Administration Costs** (M$/YR)

Conservation Administration Costs are the total administrative costs to a utility from a conservation program and are a function of ADDCST(the overhead or administrative costs of a process efficiency program in dollars per mBtu) multiplied by the number of mBtu's expected to be saved by the program(determined by the participation response, marginal efficiencies and the device energy requirement additions). This calculation is made in the demand sector.

CONADM (SECTOR,FUEL,YEAR)**: Conservation Administration Costs** (M$/YR)

Conservation Administration Costs are the total administrative costs to a utility from a conservation program and are a function of ADDCST(the overhead or administrative costs of a process efficiency program in dollars per mBtu) multiplied by the number of mBtu's expected to be saved by the program(determined by the participation response, marginal efficiencies and the device energy requirement additions). This calculation is made in the demand sector.

CONCAP (SECTOR,FUEL,YEAR)**: Capitalized Conservation Expenses** (M$/YR)

The Capitalized Conservation Expense from Low Interest Loans is calculated in the demand sector as a function of the difference between the capital cost of the device with the rebate minus the rebate itself multiplied by DCCM(which represents the difference between the capital charge rate before(DCCR) and after(DCCRU) the incentive programs). This annualized capital cost per mBtu is then multiplied by the number of mBtus saved(determined by the participation response, marginal efficiencies and the device energy requirement additions) to get the total annual cost of capital.

CONCAP (SECTOR,FUEL,YEAR)**: Capitalized Conservation Expenses** (M$/YR)

The Capitalized Conservation Expense from Low Interest Loans is calculated in the demand sector as a function of the difference between the capital cost of the device with the rebate minus the rebate itself multiplied by DCCM(which represents the difference between the capital charge rate before(DCCR) and after(DCCRU) the incentive programs). This annualized capital cost per mBtu is then multiplied by the number of mBtus saved(determined by the participation response, marginal efficiencies and the device energy requirement additions) to get the total annual cost of capital.

CONCAP (SECTOR,YEAR)**: Capitalized Conservation Expenses** ((M$/YEAR))

Calculated in the demand sectors and used in the

CONCAP (SECTOR,YEAR)**: Capitalized Conservation Expenses** (M$/YEAR)

Calculated in the demand sectors and used in the

CONCST (SECTOR,YEAR)**: Conservation Costs** (M$/YEAR)

Utility conservation costs are equal to the rate based conservation costs plus conservation administration costs and conservation expenses.

CONCST (SECTOR,YEAR)**: Conservation Costs** (M$/YEAR)

Utility conservation costs are equal to the rate based conservation costs plus conservation administration costs and conservation expenses.

CONEXP (SECTOR,YEAR)**: Conservation Expenses** (M$/YEAR)

Calculated in the demand sectors and used in the total operation and maintenance cost equation.

CONEXP (SECTOR,FUEL,YEAR)**: Conservation Expense** (M$/YR)

Conservation Expenses to the sponsoring party(such as the utility) are calculated in the demand sector as the cost of the rebate(DCCU - in dollars per mBtu per year) multiplied by the number of mBtus that are saved(determined by the participation response, marginal efficiencies and the device energy requirement additions).

CONEXP (SECTOR,YEAR)**:** **Conservation Expenses** (M$/YEAR)

Calculated in the demand sectors and used in the total operation and maintenance cost equation.

CONEXP (SECTOR,FUEL,YEAR)**:** **Conservation Expense** (M$/YR)

Conservation Expenses to the sponsoring party(such as the utility) are calculated in the demand sector as the cost of the rebate(DCCU - in dollars per mBtu per year) multiplied by the number of mBtus that are saved(determined by the participation response, marginal efficiencies and the device energy requirement additions).

CONRB : **Rate Based Conservation Costs** ($M/YEAR)

The rate-based conservation cost is the weighted cost of conservation net assets and rate base additions, plus depreciation.

CONRB : **Rate Based Conservation Costs** ($M/YEAR)

The rate-based conservation cost is the weighted cost of conservation net assets and rate base additions, plus depreciation.

CPRICE (EFFI,TECH)**:** **Energy Price Dimension for Efficiency and Capital Cost Curves** ($/mBtu OR $/GJ)

CPRICE values are the X-axis values(20 points) for the Efficiency and Capital Cost Curves. They are calculated in the *initial files and are based on the marginal cost of fuel use(MCFU).

CPRICE (EFFI,TECH)**:** **Energy Price Dimension for Efficiency and Capital Cost Curves** ($/mBtu OR $/GJ)

CPRICE values are the X-axis values(20 points) for the Efficiency and Capital Cost Curves. They are calculated in the *initial files and are based on the marginal cost of fuel use(MCFU).

CROIN (ENDUSE)**:** **Conservation Return on Investment** (($/YR)/$)

The conservation return on investment is the interest rate on subsidized loans. The data should come from the conservation programs being simulated. It is used in the computation of the device capital charge rate when subsidies are present. The capital charge rate(DCCRU) is computed based on the policy investment tax credits(DPIVTC) and interest rate on subsidized loans(CROIN).

CROIN (ENDUSE)**:** **Conservation Return on Investment** (($/YR)/$)

The conservation return on investment is the interest rate on subsidized loans. The data should come from the conservation programs being simulated. It is used in the computation of the device capital charge rate when subsidies are present. The capital charge rate(DCCRU) is computed based on the policy investment tax credits(DPIVTC) and interest rate on subsidized loans(CROIN).

CSBV (YEAR)**: Book Value of Common Stock** ($/SHARE)

The book value of common stock is defined as the book value of equity (CSEQ) divided by the common shares outstanding (CSSO).

CSBV (YEAR)**: Book Value of Common Stock** ($/SHARE)

The book value of common stock is defined as the book value of equity (CSEQ) divided by the common shares outstanding (CSSO).

CSDI (YEAR)**: Common Stock Dividends Re-invested** (M$/YR)

The common stock dividends reinvested are a user specified fraction (CDDIF) of the value of common stock (CSDV).

CSDI (YEAR)**: Common Stock Dividends Re-invested** (M$/YR)

The common stock dividends reinvested are a user specified fraction (CDDIF) of the value of common stock (CSDV).

CSDIF (YEAR)**: Frac. of CS Div. Re-invested** (DLESS)

This variable is a user specified fraction that is applied to common stock dividends to get the dividends reinvested. The value can be found in the company's Annual Report's Comparative Balance Sheet. The values for the historical years are calculated in EDATA by dividing the amount of common stock re-invested (XCSDI) by the amount of common stock dividends declared (XCSDV).

CSDIF (YEAR)**: Frac. of CS Div. Re-invested** (DLESS)

This variable is a user specified fraction that is applied to common stock dividends to get the dividends reinvested. The value can be found in the company's Annual Report's Comparative Balance Sheet. The values for the historical years are calculated in EDATA by dividing the amount of common stock re-invested (XCSDI) by the amount of common stock dividends declared (XCSDV).

CSDR (YEAR)**: Common Stock Dividend Rate** ($/SHARE/YR)

The dividend per share is determined by the funds available (CSDV) divided by the shares outstanding (CSSO).

CSDR (YEAR)**: Common Stock Dividend Rate** ($/SHARE/YR)

The dividend per share is determined by the funds available (CSDV) divided by the shares outstanding (CSSO).

CSDRL : Prior Common Stock Dividend Rate $/share/year

The prior common stock dividend rate is the CSDR lagged one year. It is used to calculate the CS target dividend rate in common stock dividend calculation number four.

CSDRL : Prior Common Stock Dividend Rate $/share/year

The prior common stock dividend rate is the CSDR lagged one year. It is used to calculate the CS target dividend rate in common stock dividend calculation number four.

CSDRMX (YEAR)**: Max. Growth Rate For CS Dividends**

A policy variable designed to produce constant growth for common stock dividends. It is used in the calculation of the common stock dividend rate.

CSDRMX (YEAR)**: Max. Growth Rate For CS Dividends**

A policy variable designed to produce constant growth for common stock dividends. It is used in the calculation of the common stock dividend rate.

CSDRTG : CS Target Dividend Rate

The common stock dividend rate is based on last year's dividend rate and the targeted dividend growth rate. If the targeted dividend rate falls in-between the maximum and minimum dividend rate, then the actual dividend rate becomes the targeted rate in common stock dividend option four.

CSDRTG : CS Target Dividend Rate

The common stock dividend rate is based on last year's dividend rate and the targeted dividend growth rate. If the targeted dividend rate falls in-between the maximum and minimum dividend rate, then the actual dividend rate becomes the targeted rate in common stock dividend option four.

CSDV (YEAR)**: Common Stock Dividends** (M$/YR)

Some dividend policies provide dividends as a constant or growing fraction of income. Dividends can also be based on a policy to provide constant growth and to provide a specific rate of return. The model provides a policy which sets the dividends paid to some fraction of the allowed return on equity times the equity book value. The actual dividend (CSDV) is the minimum of that which would result from the growth or the specified return policy.

CSDV (YEAR)**: Common Stock Dividends** (M$/YR)

Some dividend policies provide dividends as a constant or growing fraction of income. Dividends can also be based on a policy to provide constant growth and to provide a specific rate of return. The model provides a policy which sets the dividends paid to some fraction of the allowed return on equity times the equity book value. The actual dividend (CSDV) is the minimum of that which would result from the growth or the specified return policy.

CSDVFR (YEAR)**: Div. Frac. earned by CS sold during year**

CSDVFR is an exogenously specified input used to determine the total value of the common stock dividend.

CSDVFR (YEAR)**: Div. Frac. earned by CS sold during year**

CSDVFR is an exogenously specified input used to determine the total value of the common stock dividend.

CSDVSW : CS Dividend Switch Time (YEAR)

The CS Dividend Switch Time selects one of four options for calculating common stock dividends.

CSDVSW : CS Dividend Switch Time (YEAR)

The CS Dividend Switch Time selects one of four options for calculating common stock dividends.

CSEQ : Total Common Stock Equity

Total common stock equity is the sum of common stock and retained earnings

CSEQ : Total Common Stock Equity ($M)

Total common stock equity is the sum of common stock and retained earnings

CSFD (YEAR)**: Funds from Common Stock** (M$/YR)

If additional funds are needed the utility can generate funds by issuing common stock (after liquefying short term investments, issuing long term debt, and preferred stock) No limit is place on common stock issues - the company can dilute common stock as necessary

CSFD (YEAR)**: Funds from Common Stock** (M$/YR)

If additional funds are needed the utility can generate funds by issuing common stock (after liquefying short term investments, issuing long term debt, and preferred stock) No limit is place on common stock issues - the company can dilute common stock as necessary

CSLM (YEAR)**: CS Minimum Fraction of Total Capitalization**

An exogenously specified input variable used to control the debt/equity ratio. No stock can be repurchased if common stock does not at least represent a specified minimum fraction (CSLM) of total capitalization (TCAP).

CSLM (YEAR)**: CS Minimum Fraction of Total Capitalization**

An exogenously specified input variable used to control the debt/equity ratio. No stock can be repurchased if common stock does not at least represent a specified minimum fraction (CSLM) of total capitalization (TCAP).

CSMB (YEAR)**: CS Market to Book Value Ratio** (DLESS)

CS Market to Book Value Ratio is an exogenously specified input used (if the CSMBSW is equal to zero) in the calculation of the market value of common stock (CSMV)

CSMB (YEAR)**: CS Market to Book Value Ratio** (DLESS)

CS Market to Book Value Ratio is an exogenously specified input used (if the CSMBSW is equal to zero) in the calculation of the market value of common stock (CSMV)

CSMBSW : CS Market to Book Value Ratio Switch (0=Exo.)

If equal to one, then the market value of common stock is determined with an endogenous calculation based on the current dividend rate, the allowed return on equity and the dividend growth rate.

CSMBSW : CS Market to Book Value Ratio Switch (0=Exo.)

If equal to one, then the market value of common stock is determined with an endogenous calculation based on the current dividend rate, the allowed return on equity and the dividend growth rate.

CSMV (YEAR)**: Market Value of Common Stock** ($/SHARE)

The market value of common stock is calculated as the product of the book value of common stock (CSBV) and an exogenously supplied market to book ratio (CSMB).

CSMV (YEAR)**: Market Value of Common Stock** ($/SHARE)

The market value of common stock is calculated as the product of the book value of common stock (CSBV) and an exogenously supplied market to book ratio (CSMB).

CSPAYO (YEAR)**: Common Stock Payout Ratio**

A calibrated variable used to determine common stock dividend when multiplied by the total common stock.

CSPAYO (YEAR)**: Common Stock Payout Ratio**

A calibrated variable used to determine common stock dividend when multiplied by the total common stock.

CSPF (YEAR)**: Fraction of CS which may be Purchased** (1/YR)

A limited fraction of outstanding stock can be purchased per year to avoid excessive market changes in stock prices. This fraction is user specified.

CSPF (YEAR)**: Fraction of CS which may be Purchased** (1/YR)

A limited fraction of outstanding stock can be purchased per year to avoid excessive market changes in stock prices. This fraction is user specified.

CSPR (YEAR)**: Common Stock Risk Premium** (1/YR)

This exogenously specified input variable represents the real return on common stock. Calculated in EDATA, the historical value is the difference between XAROE (historical allowed return on equity) and XINSM (historical smoothed interest rate). Future values are the average of the historical values. Along with the smoothed inflation rate, it is used to calculate the common stock dividend rate.

CSPR (YEAR)**: Common Stock Risk Premium** (1/YR)

This exogenously specified input variable represents the real return on common stock. Calculated in EDATA, the historical value is the difference between XAROE (historical allowed return on equity) and XINSM (historical smoothed interest rate). Future values are the average of the historical values. Along with the smoothed inflation rate, it is used to calculate the common stock dividend rate.

CSPU (YEAR)**: Common Stock Purchased by Company** (M$/YR)

If a utility has funds left over from business operations and common stock reinvestments is can use excess cash to buy back common stock (CSPU). No stock can be repurchased if common stock does not at least represent a specified minimum fraction of total capitalization. also a limited fraction of outstanding stock can be purchased per year to avoid excessive market changes in stock prices.

CSPU (YEAR)**: Common Stock Purchased by Company** (M$/YR)

If a utility has funds left over from business operations and common stock reinvestments is can use excess cash to buy back common stock (CSPU). No stock can be repurchased if common stock does not at least represent a specified minimum fraction of total capitalization. also a limited fraction of outstanding stock can be purchased per year to avoid excessive market changes in stock prices.

CSSO (YEAR)**: Common Stock Shares Outstanding** (MILLIONS)

Common stock shares outstanding is the integral of sales and repurchases.

CSSO (YEAR)**: Common Stock Shares Outstanding** (MILLIONS)

Common stock shares outstanding is the integral of sales and repurchases.

CSSP (YEAR)**: Shares of CS Re-Purchased** ($M/YR)

Assuming that common stock is repurchased at the maximum of either the book or the market value, then repurchases (CSSP) equal the common stock purchased (CSPU) divided by the maximum of the book or market value.

CSSP (YEAR)**: Shares of CS Re-Purchased** ($M/YR)

Assuming that common stock is repurchased at the maximum of either the book or the market value, then repurchases (CSSP) equal the common stock purchased (CSPU) divided by the maximum of the book or market value.

CSSS (YEAR)**: Shares of Common Stock Sold** ($M/YR)

New shares of common stock sold are equal to the casles (CSFD) plus the reinvestment (CSDI) divided by the market value.

CSSS (YEAR)**: Shares of Common Stock Sold** ($M/YR)

New shares of common stock sold are equal to the funds from common stock (CSFD) plus the reinvestment (CSDI) divided by the market value.

CSTK (YEAR)**: Common Stock** (M$)

Total value of common stock.

CSTK (YEAR)**: Common Stock** (M$)

Total value of common stock.

CTP (CLASS,MONTH,YEAR)**: Contribution to Electric Peak Load** (MW)

Calculated in the demand sectors, CTP is used in the utility sector to apportion financial responsibility. Prices to each customer class are determined in part through contribution to peak.

CTP (CLASS,MONTH,YEAR)**: Contribution to Electric Peak Load** MW

Calculated in the demand sectors, CTP is used in the utility sector to apportion financial responsibility. Prices to each customer class are determined in part through contribution to peak.

CTPSM : Smoothed Value of Contribution to Peak

The smoothed value of the contribution to peak is the sum of each month's contributions to peak, integrated over time. This value is updated by replacing a fraction of the old value determined by the smoothing time. For example, if the smoothing time is five years, 1/5 of the old value is replaced each year.

CTPSM : Smoothed Value of Contribution to Peak

The smoothed value of the contribution to peak is the sum of each month's contributions to peak, integrated over time. This value is updated by replacing a fraction of the old value determined by the smoothing time. For example, if the smoothing time is five years, 1/5 of the old value is replaced each year.

CUC (PLANT,LV12,YEAR)**: Cap. Under Construction in Prev. Period** (MW)

The capacity under construction in the previous period is based on the construction initiated. It is used in the calculation of PCUC>

CUC (PLANT,LV12,YEAR)**: Cap. Under Construction in Prev. Period** (MW)

The capacity under construction in the previous period is based on the construction initiated. It is used in the calculation of PCUC>

CUCI (PLANT,LV12)**: Initial Cap. under Construction** (MW)

An exogenously specified input used to initialize the model

CUCI (PLANT,LV12)**: Initial Cap. under Construction** (MW)

An exogenously specified input used to initialize the model

CUF (ENDUSE,TECH,EC,YEAR)**: Capacity Utilization Factor** ((\$/YR)/(\$/YR))

The Capacity Utilization Factor(CUF) differs from the Economic Capacity Utilization Factor(ECUF). While ECUF picks up shifts in gross output, CUF is a calibrated variable reflecting energy demand fluctuations not explained by the other utilization factors. Fluctuations in this variable should be random(no pattern of steady increase or decrease) when they occur and the variable's usual value is one. The economic capacity utilization factor(CUF) depends on use or occupancy(determined by the economy) and is calibrated from the difference between historical sales and historical potential demand. It modifies energy demand(DMD).

CUF (ENDUSE,TECH,EC,YEAR)**: Capacity Utilization Factor** (($/YR)/($/YR))

The Capacity Utilization Factor(CUF) differs from the Economic Capacity Utilization Factor(ECUF). While ECUF picks up shifts in gross output, CUF is a calibrated variable reflecting energy demand fluctuations not explained by the other utilization factors. Fluctuations in this variable should be random(no pattern of steady increase or decrease) when they occur and the variable's usual value is one. The economic capacity utilization factor(CUF) depends on use or occupancy(determined by the economy) and is calibrated from the difference between historical sales and historical potential demand. It modifies energy demand(DMD).

CVF (ENDUSE,TECH,CTECH,EC)**: Conversion Market Share Variance Factor** (DLESS)

A calibrated variable used in the calculation of fuel conversion market shares in the demand sector.

CVF (ENDUSE,TECH,CTECH,EC)**: Conversion Market Share Variance Factor** (DLESS)

A calibrated variable used in the calculation of fuel conversion market shares in the demand sector.

CW (PLANT,LV12)**: Construction Work in Progress** $M/YR

Construction work in progress is summed over plant and used in the generating plant construction expenditure (TCW) equation. It is calculated based on the amount, type and level of construction initiated.

CW (PLANT,LV12)**: Construction Work in Progress** $M/YR

Construction work in progress is summed over plant and used in the generating plant construction expenditure (TCW) equation. It is calculated based on the amount, type and level of construction initiated.

CWAC (PLANT,LV12,YEAR)**: Construction Work in Progress Accumulated** (M$)

The accumulated construction work in progress is the integral of construction work in progress (CW).

CWAC (PLANT,LV12,YEAR)**: Construction Work in Progress Accumulated** (M$)

The accumulated construction work in progress is the integral of construction work in progress (CW).

CWACI (PLANT,LV12)**: Initial Construction Work Accumulated** (M$)

An exogenously specified input used to initialize the model

CWACI (PLANT,LV12)**: Initial Construction Work Accumulated** (M$)

An exogenously specified input used to initialize the model

CWDFRB (YEAR)**: CW portion of Deferred Rate Base** (M$/YR)

The CW portion of the deferred rate base represents the plant that is not immediately allowed in the rate base. It is used in the calculation of AFAF.

CWDFRB (YEAR)**: CW portion of Deferred Rate Base** (M$/YR)

The CW portion of the deferred rate base represents the plant that is not immediately allowed in the rate base. It is used in the calculation of AFAF.

CWGA (PLANT,YEAR)**: Construction Work into Gross Assets** (M$)

At the end of each year CWAC is shifted to the next year. If any plants are completed, CWAC is added to Construction Work into Gross Assets - in other words become part of a utility's in-service assets.

CWGA (PLANT,YEAR)**: Construction Work into Gross Assets** (M$)

At the end of each year CWAC is shifted to the next year. If any plants are completed, CWAC is added to Construction Work into Gross Assets - in other words become part of a utility's in-service assets.

CWGAA (AA,YEAR)**: DIRECT CONS COSTS TO GA** (M$)

The construction work additions to gross adds include newly completed plants (CWGA), capacity capital additions (GCAD), T&D construction (TDTBF), miscellaneous capital expenditures (MISCGA) and any capitalized costs of firm purchases (FPTBF).

CWGAA (AA,YEAR)**: DIRECT CONS COSTS TO GA** (M$)

The construction work additions to gross assest include newly completed plants (CWGA), capacity capital additions (GCAD), T&D construction (TDTBF), miscellaneous capital expenditures (MISCGA) and any capitalized costs of firm purchases (FPTBF).

CWOUT (AA,YEAR)**: ASSET VINTAGE PARAMETER**

Derived from the PULSE parameter and used to move assets through time.

CWOUT (AA,YEAR)**: ASSET VINTAGE PARAMETER**

Derived from the PULSE parameter and used to move assets through time.

CWRB (YEAR)**: CW portion of Nuclear Costs into RB** (M$/YR)

The CW portion of nuclear costs into the ratebase is a function of NUCRB and the construction work portion of the deferred rate base as a percent of the total deferred rate base.

CWRB (YEAR)**: CW portion of Nuclear Costs into RB** (M$/YR)

The CW portion of nuclear costs into the ratebase is a function of NUCRB and the construction work portion of the deferred rate base as a percent of the total deferred rate base.

DAYS (SEASON)**: Days per Season**

DAYS is a conversion variable used in the calculation of gas sales in the demand sector. The values for days, which are established by convention are found in sdata.

DAYS (SEASON)**: Days per Season**

DAYS is a conversion variable used in the calculation of gas sales in the demand sector. The values for days, which are established by convention are found in sdata.

DB (YEAR)**: Long Term Debt** (M$)

Long term debt grows with new borrowings (DBFD) and declines with repayment (DBRP).

DB (YEAR)**: Long Term Debt** (M$)

Long term debt grows with new borrowings (DBFD) and declines with repayment (DBRP).

DBAIR (YEAR)**: Average Interest Rate on Debt** (1/YR)

The average interest rate for long term debt is determined by dividing the long term debt interest by the long term debt.

DBAIR (YEAR)**: Average Interest Rate on Debt** (1/YR)

The average interest rate for long term debt is determined by dividing the long term debt interest by the long term debt.

DBAL (YEAR)**: Debt Lifetime** (YRS)

DBAL is the average length of long term loans.

DBAL (YEAR)**: Debt Lifetime** (YRS)

DBAL is the average length of long term loans.

DBFD (YEAR)**: Funds from Debt** (M$/YR)

If additional funds are needed by the utility, it generates funds first by liquefying any outstanding short-term investments, the engages in long term debt funding. Long term debt is limited by the desired debt fraction and the net earnings certificate ratio.

DBFD (YEAR)**: Funds from Debt** (M$/YR)

If additional funds are needed by the utility, it generates funds first by liquefying any outstanding short-term investments, then engages in long term debt funding. Long term debt is limited by the desired debt fraction and the net earnings certificate ratio.

DBIN (YEAR)**: Debt Interest on Long Term Debt** (M$/YR)

Interest payments on long term debt equal the integral of new payments less the payments on loans retired.

DBIN (YEAR)**: Debt Interest on Long Term Debt** (M$/YR)

Interest payments on long term debt equal the integral of new payments less the payments on loans retired.

DBIR (YEAR)**: Interest Rate on New Debt** (1/YR)

The cost of long term debt is the real cost of debt plus the smoothes inflation rate. It is used in the determination of

DBIR (YEAR)**: Interest Rate on New Debt** (1/YR)

The cost of long term debt is the real cost of debt plus the smoothes inflation rate. It is used in the determination of

DBLM (YEAR)**: Debt Max. Frac. of Total Capitalization**

An exogenously specified fractionof total capital which can be in the form of debt.

DBLM (YEAR)**: Debt Max. Frac. of Total Capitalization**

An exogenously specified fraction of total capital which can be in the form of debt.

DBNLM (YEAR)**: Limit on New Long Term Debt** (M$)

A limit on long term debt a utility may issue is calculated as the minimum of two partial limits, one based on the fraction of total capital which can be in the form of debt and other based on the net earnings certificate ratio.

DBNLM (YEAR)**: Limit on New Long Term Debt** (M$)

A limit on long term debt a utility may issue is calculated as the minimum of two partial limits, one based on the fraction of total capital which can be in the form of debt and other based on the net earnings certificate ratio.

DBPR (YEAR)**: Long Term Debt Risk Premium** (1/YR)

An exogenously specified variable representing the real rate of interest required on long term debt. Calculated from the historical interest rate (XDBIR) less the smoothed inflation rate (XINSM). Used to calculate yearly long term debt service.

DBPR (YEAR)**: Long Term Debt Risk Premium** (1/YR)

An exogenously specified variable representing the real rate of interest required on long term debt. Calculated from the hhistorical interest rate (XDBIR) less the smoothed inflation rate (XINSM). Used to calculate yearly long term debt service.

DBRIN (YEAR)**: Interest on Debt Repaid** (M$/YR)

Interest on Debt repaid equals the DBNIN of DBAL years prior.

DBRIN (YEAR)**: Interest on Debt Repaid** (M$/YR)

Interest on Debt repaid equals the DBNIN of DBAL years prior.

DBRP (YEAR)**: Debt Repaid** (M$/YR)

Long term debt repaid is equal to the total intermediate debt divided by the debt lifetime.

DBRP (YEAR)**: Debt Repaid** (M$/YR)

Long term debt repaid is equal to the total intermediate debt divided by the debt lifetime.

DCA (YEAR)**: Decommission Annual Cost** (M$)

The yearly cost of the decommissioning Escrow Account is the unit cost (DECC) multiplied by the capacity on-line (GC) divided by the plant life (GCPL). The GCPL term annualized the cost over the life of the plant

DCA (YEAR)**: Decommission Annual Cost** (M$)

The yearly cost of the decommissioning Escrow Account is the unit cost (DECC) multiplied by the capacity on-line (GC) divided by the plant life (GCPL). The GCPL term annualized the cost over the life of the plant

DCAC (YEAR)**: Decommission Cost Escrow Account** (M$)

The total value of the decommissioning escrow account is equal to the yearly additions to the account plus the interest earned on the account.

DCAC (YEAR)**: Decommission Cost Escrow Account** (M$)

The total value of the decommissioning escrow account is equal to the yearly additions to the account plus the interest earned on the accout.

DCACI : Initial Value of Decommissioning Cost Escrow Account

The initial value of the decommissioning cost escrow account is exogenously specified.

DCACI : Initial Value of Decommissioning Cost Escrow Account

The initial value of the decommissioning cost escrow account is exogenously specified.

DCAT : Time Required to Decommission (Years)

An exogenously specified input used in the calculation of the decommissioning completion rate (DCGCCR).

DCAT : Time Required to Decommission (Years)

An exogenously specified input used in the calculation of the decommissioning completion rate (DCGCCR).

DCC (ENDUSE,TECH,EC,YEAR)**: Device Capital Cost** ($/(mBtu/YR) or $/(GJ/YR))

Once a level of device efficiency is chosen, the corresponding capital cost is known from trade-off curves contained in the model in the demand sector. A certain capital cost buys a certain level of efficiency. It is used in the calculation of the marginal cost of fuel use(MCFU) in the demand sector.

DCC (ENDUSE,TECH,EC,YEAR)**: Device Capital Cost** ($/(mBtu/YR) or $/(GJ/YR))

Once a level of device efficiency is chosen, the corresponding capital cost is known from trade-off curves contained in the model in the demand sector. A certain capital cost buys a certain level of efficiency. It is used in the calculation of the marginal cost of fuel use(MCFU) in the demand sector.

DCC1 (CENDUSE,TECH,EC,YEAR)**: Device Capital Cost** ($/(mBtu/YR) or $/(GJ/YR))

Once a level of device efficiency is chosen, the corresponding capital cost is known from trade-off curves contained in the model in the demand sector. A certain capital cost buys a certain level of efficiency. It is used in the calculation of the marginal cost of fuel use(MCFU) in the demand sector.

DCC1 (CENDUSE,TECH,EC,YEAR)**: Device Capital Cost** ($/(mBtu/YR) or $/(GJ/YR))

Once a level of device efficiency is chosen, the corresponding capital cost is known from trade-off curves contained in the model in the demand sector. A certain capital cost buys a certain level of efficiency. It is used in the calculation of the marginal cost of fuel use(MCFU) in the demand sector.

DCCM (TECH)**: Device Capital Charge Rate Multiplier** (($/YR)/$)

This variable has a value when incentive programs that modify the DCCR are being tested. The device capital cost(DCC) is modified by DCCM due to the difference between the capital charge rate before(DCCR) and after(DCCRU) the incentive programs. All calculations are performed in the demand sector.

DCCM (TECH)**: Device Capital Charge Rate Multiplier** (($/YR)/$)

This variable has a value when incentive programs that modify the DCCR are being tested. The device capital cost(DCC) is modified by DCCM due to the difference between the capital charge rate before(DCCR) and after(DCCRU) the incentive programs. All calculations are performed in the demand sector.

DCCP (ENDUSE,TECH,EC,YEAR)**: Capital Cost of "rebated" Device** ($/(mBtu/YR) or $/(GJ/YR))

DCCP is the new capital cost of a device for which a rebate has been offered. This variable is an input required for certain policies to be tested. It affects the calculation of DCC in the demand sector. For DCCP to be effective, it must be set equal to or greater than the existing level of DCC.

DCCP (ENDUSE,TECH,EC,YEAR)**: Capital Cost of "rebated" Device** ($/(mBtu/YR) or $/(GJ/YR))

DCCP is the new capital cost of a device for which a rebate has been offered. This variable is an input required for certain policies to be tested. It affects the calculation of DCC in the demand sector. For DCCP to be effective, it must be set equal to or greater than the existing level of DCC.

DCCR (ENDUSE,TECH,EC,YEAR)**: Device Capital Charge Rate** (($/YR)/$)

The device capital charge rate is the annualization of device capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of device efficiency improvements over the life of the investment.

DCCR (ENDUSE,TECH,EC,YEAR)**: Device Capital Charge Rate** (($/YR)/$)

The device capital charge rate is the annualization of device capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of device efficiency improvements over the life of the investment.

DCCR1 (CENDUSE,TECH,EC,YEAR)**: Device Capital Charge Rate** (($/YR)/$)

The device capital charge rate is the annualization of device capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of device efficiency improvements over the life of the investment.

DCCR1 (CENDUSE,TECH,EC,YEAR)**: Device Capital Charge Rate** (($/YR)/$)

The device capital charge rate is the annualization of device capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of device efficiency improvements over the life of the investment.

DCCRN (ENDUSE,TECH,EC,ZERO)**: Device Capital Charge Rate** (($/YR)/$)

The device capital charge rate is the annualization of device capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of device efficiency improvements over the life of the investment. The equation is calculated in the demand sectors and is used to determine the normal device capital cost(DCCN) which in turn is used to determine the level of process efficiency selected(DEET).

DCCRN (ENDUSE,TECH,EC,ZERO)**: Device Capital Charge Rate** (($/YR)/$)

The device capital charge rate is the annualization of device capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during

construction. It is used to apportion the costs of device efficiency improvements over the life of the investment. The equation is calculated in the demand sectors and is used to determine the normal device capital cost(DCCN) which in turn is used to determine the level of process efficiency selected(DEET).

DCCRU (TECH,EC)**: Device Capital Charge Rate with Subsidy** (($/YR)/$)

The capital charge rate(DCCRU) is computed in the demand sector based on the policy investment tax credits(DPIVTC) and interest rate on subsidized loans(CROIN). It is used in the same manner as DCCR.

DCCRU (TECH,EC)**: Device Capital Charge Rate with Subsidy** (($/YR)/$)

The capital charge rate(DCCRU) is computed in the demand sector based on the policy investment tax credits(DPIVTC) and interest rate on subsidized loans(CROIN). It is used in the same manner as DCCR.

DCCT (ENDUSE,EFFI,TECH,EC)**: Price vs Capital Cost Table** ($/mBtu or $/GJ)

The values for the efficiency(DEET) and capital cost(DCCT) curves are interpolated based on input values. This table is used in the calculation of DCC(device capital cost)

DCCT (ENDUSE,EFFI,TECH,EC)**: Price vs. Capital Cost Table** ($/mBtu or $/GJ)

The values for the efficiency(DEET) and capital cost(DCCT) curves are interpolated based on input values. This table is used in the calculation of DCC(device capital cost)

DCCU (ENDUSE,TECH,EC,YEAR)**: Device Capital Cost Subsidy** ($/(mBtu/YR) or $/(GJ/YR))

The DCCU is a policy input variable that varies with the policy being tested. By definition the subsidy cannot exceed the cost of the device. It is used to alter DCC and thereby change the level of efficiency(DEE) selected by consumers.

DCCU (ENDUSE,TECH,EC,YEAR)**: Device Capital Cost Subsidy** ($/(mBtu/YR) or $/(GJ/YR))

The DCCU is a policy input variable that varies with the policy being tested. By definition the subsidy cannot exceed the cost of the device. It is used to alter DCC and thereby change the level of efficiency(DEE) selected by consumers.

DCEC (YEAR)**: Estimated Decommissioning Cost** ($/KW)

An exogenously specified input variable representing future decommissioning costs used in the decommissioning annual cost determination.

DCEC (YEAR)**: Estimated Decommissioning Cost** ($/KW)

An exogenously specified input variable representing future decommissioning costs used in the decommissioning annual cost determination.

DCEXP (YEAR)**: Current Decommissioning Expenses** ((M$/YEAR))

The decommissioning expensed for the current period are equal to the amount of capacity decommissioned times the decommissioning cost per unit.

DCEXP (YEAR)**: Current Decommissioning Expenses** (M$/YEAR)

The decommissioning expensed for the current period are equal to the amount of capacity decommissioned times the decommissioning cost per unit.

DCFR (YEAR)**: Fraction of Decommissioning Complete** MW/MW

The fraction of decommissioning that is complete is equal to the cumulative amount of capacity which has completed decommissioning divided by the total amount of capacity which will ever be decommissioned.

DCFR (YEAR)**: Fraction of Decommissioning Complete** (MW/MW)

The fraction of decommissioning that is complete is equal to the cumulative amount of capacity which has completed decommissioning divided by the total amount of capacity which will ever be decommissioned.

DCGC (YEAR)**: Generating Capacity being Decommissioned** (MW)

The amount of capacity being decommissioned is equal to the amount undergoing decommissioning in the previous year plus any nuclear capacity retired less capacity that completes decommissioning. It is used in the calculation of the decommissioning completion rate (DCGCCR).

DCGC (YEAR)**: Generating Capacity being Decommissioned** (MW)

The amount of capacity being decommissioned is equal to the amount undergoing decommissioning in the previous year plus any nuclear capacity retired less capacity that completes decommissioning. It is used in the calculation of the decommissioning completion rate (DCGCCR).

DCGCCR (YEAR)**: Decommissioning Completion Rate** (MW/YEAR)

The nuclear capacity which completes decommissioning is a function of the capacity being decommissioned and the time required for decommissioning.

DCGCCR (YEAR)**: Decommissioning Completion Rate** MW/YEAR

The nuclear capacity which completes decommissioning is a function of the capacity being decommissioned and the time required for decommissioning.

DCGCDC (YEAR)**: Generating Capacity with Decommissioning Complete** (MW)

The cumulative amount of capacity which has completed decommissioning is equal to the value in the previous period plus the capacity which has completed decommissioning during the current period.

DCGCDC (YEAR)**: Generating Capacity with Decommissioning Complete** (MW)

The cumulative amount of capacity which has completed decommissioning is equal to the value in the previous period plus the capacity which has completed decommissioning during the current period.

DCINT (YEAR)**: decommission Cost Interest** M$

The model includes the interest earned on the escrow account by assuming that the account accrues interest equal to that paid on new debt (DBIR).

DCINT (YEAR)**: DecommIssioning Cost Interest** (M$)

The model includes the interest earned on the escrow account by assuming that the account accrues interest equal to that paid on new debt (DBIR).

DCMM (ENDUSE,EC,YEAR)**: Capital Cost Maximum Multiplier** ($/$)

The DCMM is used to recompute the device capital cost(DCC) to include the impact of the device efficiency programs. It is a policy variable and is set equal to one when not in use.

DCMM (ENDUSE,EC,YEAR)**: Capital Cost Maximum Multiplier** ($/$)

The DCMM is used to recompute the device capital cost(DCC) to include the impact of the device efficiency programs. It is a policy variable and is set equal to one when not in use.

DCRV (YEAR)**: Differential Charge Revenues** (M$/YEAR)

The differential charge revenue is calculated by multiplying projected sales by the calibrated delivery charge per GWH, adjusted for inflation, and summing over all customer classes.

DCRV (YEAR)**: Differential Charge Revenues** (M$/YEAR)

The differential charge revenue is calculated by multiplying projected sales by the calibrated delivery charge per gWh, adjusted for inflation, and summing over all customer classes.

DCTC (ENDUSE,TECH,EC)**: Device Capital Trade Off Coefficient** (DLESS)

This capital cost coefficient is used to estimate Consumer Preference Efficiency and Capital Cost Curves(DCCT,DEET). It is calculated in the initial files from fuel prices, device capital costs and device efficiencies.

DCTC (ENDUSE,TECH,EC)**: Device Capital Trade Off Coefficient** (DLESS)

This capital cost coefficient is used to estimate Consumer Preference Efficiency and Capital Cost Curves(DCCT,DEET). It is calculated in the initial files from fuel prices, device capital costs and device efficiencies.

DCTOT (YEAR)**: Total Capacity to be Decommissioned** (MW)

The total amount of capacity which will ever be decommissioned is equal to the existing nuclear capacity plus the capacity being decommissioned and the capacity already decommissioned.

DCTOT (YEAR)**: Total Capacity to be Decommissioned** (MW)

The total amount of capacity which will ever be decommissioned is equal to the existing nuclear capacity plus the capacity being decommissioned and the capacity already decommissioned.

DCUC (YEAR)**: Actual Decommissioning Cost** ($/kW)

An exogenously specified input variable used in the calculation of decommissioning expenses.

DCUC (YEAR)**: Actual Decommissioning Cost** ($/kW)

An exogenously specified input variable used in the calculation of decommissioning expenses.

DDM (ENDUSE,YEAR)**: Degree Day Multiplier** (DD/DD Normal)

The DDM is one of two variables represent the effects of weather on energy demand - the other is the fraction of Temperature Sensitive Load(TSLOAD). Each end-use has a specified fraction of its load designated as temperature-sensitive. This fraction ranges from zero to one. This portion of the load is adjusted in response to a change in the degree day multiplier(DDM - usually set equal to one). If a period of time is expected to have warmer or cooler temperatures than normal, the DDM is adjusted to reflect this expected temperature increase or decrease and the energy demand from temperature sensitive load is adjusted accordingly. This variable is generally used when developing alternative scenarios on which to test policies - for example to determine the effects of global warming. It can also be used to model weather patterns that are expected to differ in the short term. The baseline or default value is usually set equal to one.

DDM (ENDUSE,YEAR)**: Degree Day Multiplier** (DD/DD Normal)

The DDM is one of two variables represent the effects of weather on energy demand - the other is the fraction of Temperature Sensitive Load(TSLOAD). Each end-use has a specified fraction of its load designated as temperature-sensitive. This fraction ranges from zero to one. This portion of the load is adjusted in response to a change in the degree day multiplier(DDM - usually set equal to one). If a period of time is expected to have warmer or cooler temperatures than normal, the DDM is adjusted to reflect this expected temperature increase or decrease and the energy demand from temperature sensitive load is adjusted accordingly. This variable is generally used when developing alternative scenarios on which to test policies - for example to determine the effects of global warming. It can also be used to model weather patterns that are expected to differ in the short term. The baseline or default value is usually set equal to one.

DEE (ENDUSE,TECH,EC,YEAR)**: Device Efficiency** (Btu/Btu OR J/J)

DEE(Marginal Device Efficiency is the ratio of energy into the device to the useable energy out of it. The DEE is determined by the fuel prices(ECFP). As prices rise, marginal device efficiencies rise as well. As with marginal process efficiency, once DEE is known, Device Capital Costs(DCC) are also known through the estimated trade-off curves. How much additional device efficiency will be selected as prices rise depends on consumer preferences for higher upfront capital costs over higher operating costs in the future. All calculations are performed in the demand sector.

DEE (ENDUSE,TECH,EC,YEAR)**: Device Efficiency** (Btu/Btu OR J/J)

DEE(Marginal Device Efficiency is the ratio of the amount of fuel or input energy required per unit of process or output energy produced. For example, if a water heater produces y PJ of hot water during a year and requires x PJ of electricity, the device efficiency is y/x PJ/PJ. The device efficiency is developed by dividing the output energy by the input of fuel usage of an appliance. The DEE is determined in the model by the fuel prices(ECFP). As prices rise, marginal device efficiencies rise as well. As with marginal process efficiency, once DEE is known, Device Capital Costs(DCC) are also known through the estimated trade-off curves. How much additional device efficiency will be selected as prices rise depends on consumer preferences for higher upfront capital costs over higher operating costs in the future. All calculations are performed in the demand sector.

DEEA (ENDUSE,TECH,EC,YEAR)**: Average Device Efficiency** (Btu/Btu OR J/J)

The average device efficiency(DEEA) is calculated from the marginal device efficiency(DEE) and process energy requirements(PER). If process energy requirements are low due to the dampening effect on the economy of high fuel prices, although device efficiencies at the margin will rise, there will be little impact on average device efficiency. The DEEA is used in many model calculations in the demand sector especially in the calculation of the Device Energy Requirements Additions(DERA).

DEEA (ENDUSE,TECH,EC,YEAR)**: Average Device Efficiency** (Btu/Btu OR J/J)

The average device efficiency(DEEA) is calculated from the marginal device efficiency(DEE) and process energy requirements(PER). If process energy requirements are low due to the dampening effect on the economy of high fuel prices, although device efficiencies at the margin will rise, there will be little impact on average device efficiency. The DEEA is used in many model calculations in the demand sector especially in the calculation of the Device Energy Requirements Additions(DERA).

DEEP (ENDUSE,TECH,EC,YEAR)**: Policy Device Efficiency** (Btu/Btu OR J/J)

A policy variable that effects unit energy additions, DEEP values vary with the policy being tested but are assumed to be higher than DEE.

DEEP (ENDUSE,TECH,EC,YEAR)**: Policy Device Efficiency** (Btu/Btu OR J/J)

A policy variable that effects unit energy additions, DEEP values vary with the policy being tested but are assumed to be higher than DEE.

DEER (ENDUSE,TECH,EC,YEAR)**: Policy Participation Response** (Btu/Btu OR J/J)

The consumer response(DEER) to incentive programs is calculated based on the required efficiency(DEEP), the efficiency before the programs(DEEB) and the efficiency after the programs(DEE). It is used to modify the device capital cost(DCC) to reflect the impact of the incentive program in the demand sector.

DEER (ENDUSE,TECH,EC,YEAR)**: Policy Participation Response** (Btu/Btu OR J/J)

The consumer response(DEER) to incentive programs is calculated based on the required efficiency(DEEP), the efficiency before the programs(DEEB) and the efficiency after the programs(DEE). It is used to modify the device capital cost(DCC) to reflect the impact of the incentive program in the demand sector.

DEET (ENDUSE,EFFI,TECH,EC)**: Price vs. Efficiency Table** (Btu/Btu OR J/J)

The values for the efficiency(DEET) and capital cost(DCCT) curves are interpolated based on input values.

DEET (ENDUSE,EFFI,TECH,EC)**: Price vs Efficiency Table** (Btu/Btu OR J/J)

The values for the efficiency(DEET) and capital cost(DCCT) curves are interpolated based on input values.

DEM (ENDUSE,TECH,EC)**: Maximum Device Efficiency** (Btu/Btu OR J/J)

National data is used for DEM, maximum device efficiency by enduse and technology. DEM is used in the calculation of loss intensity - the waste heat from inefficiencies in the demand sector.

DEM (ENDUSE,TECH,EC)**: Maximum Device Efficiency** (Btu/Btu OR J/J)

National data is used for DEM, maximum device efficiency by enduse and technology. DEM is used in the calculation of loss intensity - the waste heat from inefficiencies in the demand sector.

DEMM (ENDUSE,TECH,EC,YEAR)**: Technological Improvements in Devices** (Btu/Btu OR J/J)

Technological Improvements in Devices(DEMM) is a non-price factor in the consideration of the level of device efficiency to be selected. DEMM is a calibrated variable that can be altered in the future as a policy variable. During historical calibration, the model compares its estimated device efficiencies with the actual historical device efficiencies, to the extent that this information is available. If there is a difference between the two sets of values, improvements in technology are assumed.

DEMM (ENDUSE,TECH,EC,YEAR)**: Technological Improvements in Devices** (Btu/Btu OR J/J)

Technological Improvements in Devices(DEMM) is a non-price factor in the consideration of the level of device efficiency to be selected. DEMM is a calibrated variable that can be altered in the future as a policy variable. During historical calibration, the model compares its estimated device efficiencies with the actual historical device efficiencies, to the extent that this information is available. If there is a difference between the two sets of values, improvements in technology are assumed.

DER (ENDUSE,TECH,EC,YEAR)**: Device Energy Requirement** (mBtu/YR OR GJ/YR)

Device Energy Requirements are calculated in the demand sector as existing requirements plus any additions(DERA) and less any retirements(DERR) which makes it a function of Process Energy Requirements(PER) and Marginal Device Efficiency(DEE). The DEE is determined by the fuel prices(ECFP). As prices rise, marginal device efficiencies rise as well. As with marginal process efficiency, once DEE is known, Device Capital Costs(DCC) are also known through the estimated trade-off curves. How much additional device efficiency will be selected as prices rise depends on consumer preferences for higher upfront capital costs over higher operating costs in the future.

DER (ENDUSE,TECH,EC,YEAR)**: Device Energy Requirement** (mBtu/YR OR GJ/YR)

Device Energy Requirements are calculated in the demand sector as existing requirements plus any additions(DERA) and less any retirements(DERR) which makes it a function of Process Energy Requirements(PER) and Marginal Device Efficiency(DEE). The DEE is determined by the fuel prices(ECFP). As prices rise, marginal device efficiencies rise as well. As with marginal process efficiency, once DEE is known, Device Capital Costs(DCC) are also known through the estimated trade-off curves. How much additional device efficiency will be selected as prices rise depends on consumer preferences for higher upfront capital costs over higher operating costs in the future.

DER1 (ENDUSE,TECH,EC,YEAR)**: Device Energy Requirement** (mBtu/YR OR GJ/YR)

Device Energy Requirements are calculated in the demand sector as existing requirements plus any additions(DERA) and less any retirements(DERR) which makes it a function of Process Energy Requirements(PER) and Marginal Device Efficiency(DEE). The DEE is determined by the fuel prices(ECFP). As prices rise, marginal device efficiencies rise as well. As with marginal process efficiency, once DEE is known, Device Capital Costs(DCC) are also known through the estimated trade-off curves. How much additional device efficiency will be selected as prices rise depends on consumer preferences for higher upfront capital costs over higher operating costs in the future. DER1 is the first year value of DER used in cogeneration and pollution procedures.

DER1 (ENDUSE,TECH,EC,YEAR)**: Device Energy Requirement** (mBtu/YR OR GJ/YR)

Device Energy Requirements are calculated in the demand sector as existing requirements plus any additions(DERA) and less any retirements(DERR) which makes it a function of Process Energy Requirements(PER) and Marginal Device Efficiency(DEE). The DEE is determined by the fuel prices(ECFP). As prices rise, marginal device efficiencies rise as well. As with marginal process efficiency, once DEE is known, Device Capital Costs(DCC) are also known through the estimated trade-off curves. How much additional device efficiency will be selected as prices rise depends on consumer preferences for higher upfront capital costs over higher operating costs in the future. DER1 is the first year value of DER used in cogeneration and pollution procedures.

DERA (ENDUSE,TECH,EC,YEAR)**: Device Energy Requirement Addition** (mBtu/YR OR GJ/YR)

Device Energy Requirement Additions(DERA) include device replacements, and requirements from new capital additions. Energy from conversions can also be included. DERA is a function of Process Energy Requirements(PER) and Marginal Device Efficiencies(DEE). The process energy requirements determine the total energy needed; the marginal device efficiencies determine the number of devices added and are a function of fuel prices. As fuel prices rise, it becomes cost-effective to pay for greater device efficiency. Given a fuel price, device capital costs(DCC) and efficiency levels(DEE) are determined endogenously in ENERGY 2020 through the use of trade-off curves. All calculations are performed in the demand sector.

DERA (ENDUSE,TECH,EC,YEAR)**: Device Energy Requirement Addition** (mBtu/YR OR GJ/YR)

Device Energy Requirement Additions(DERA) include device replacements, and requirements from new capital additions. Energy from conversions can also be included. DERA is a function of Process Energy Requirements(PER) and Marginal Device Efficiencies(DEE). The process energy requirements determine the total energy needed; the marginal device efficiencies determine the number of devices added and are a function of fuel prices. As fuel prices rise, it becomes cost-effective to pay for greater device efficiency. Given a fuel price, device capital

costs(DCC) and efficiency levels(DEE) are determined endogenously in ENERGY 2020 through the use of trade-off curves. All calculations are performed in the demand sector.

DERA1 (ENDUSE,TECH,EC,YEAR)**:   Device Energy Requirement Addition** (mBtu/YR OR GJ/YR)

Device Energy Requirement Additions(DERA) include device replacements, and requirements from new capital additions. Energy from conversions can also be included. DERA is a function of Process Energy Requirements(PER) and Marginal Device Efficiencies(DEE). The process energy requirements determine the total energy needed; the marginal device efficiencies determine the number of devices added and are a function of fuel prices. As fuel prices rise, it becomes cost-effective to pay for greater device efficiency. Given a fuel price, device capital costs(DCC) and efficiency levels(DEE) are determined endogenously in ENERGY 2020 through the use of trade-off curves. All calculations are performed in the demand sector. DERA1 is the first year value of DERA used in pollution calculation procedures.

DERA1 (ENDUSE,TECH,EC,YEAR)**:   Device Energy Requirement Addition** (mBtu/YR OR GJ/YR)

Device Energy Requirement Additions(DERA) include device replacements, and requirements from new capital additions. Energy from conversions can also be included. DERA is a function of Process Energy Requirements(PER) and Marginal Device Efficiencies(DEE). The process energy requirements determine the total energy needed; the marginal device efficiencies determine the number of devices added and are a function of fuel prices. As fuel prices rise, it becomes cost-effective to pay for greater device efficiency. Given a fuel price, device capital costs(DCC) and efficiency levels(DEE) are determined endogenously in ENERGY 2020 through the use of trade-off curves. All calculations are performed in the demand sector. DERA1 is the first year value of DERA used in pollution calculation procedures.

DERC (ENDUSE,TECH,EC)**:   Energy Conversion Addition** (mBtu/YR OR GJ/YR)

Energy Conversion Additions(DERC) are calculated in the demand sector from the product of DERR(Device Energy Requirements Retirements) , DEEA(Average Device Efficiency), CMSF

DERC (ENDUSE,TECH,EC)**:   Energy Conversion Addition** (mBtu/YR OR GJ/YR)

Energy Conversion Additions(DERC) are calculated in the demand sector from the product of DERR(Device Energy Requirements Retirements) , DEEA(Average Device Efficiency), CMSF

DESTD (ENDUSE,TECH,EC,YEAR)**:   Device Efficiency Standards** (Btu/Btu OR J/J)

DESTD are for standards already in effect such as those included required from federal energy policy. The values are inputs in the *data files. The basecase version of the model includes the current DESTD for any end-use that has one. DESTDP is a policy variable that allows the analyst to test out different standards as policies. Both variables can override the DEE calculated in the demand sector based on fuel prices by acting as a floor level - limiting consumer choices to efficiencies above but not below the floor.

DESTD (ENDUSE,TECH,EC,YEAR)**: Device Efficiency Standards** (Btu/Btu OR J/J)

DESTD are for standards already in effect such as those included required from federal energy policy. The values are inputs in the *data files. The basecase version of the model includes the current DESTD for any end-use that has one. DESTDP is a policy variable that allows the analyst to test out different standards as policies. Both variables can override the DEE calculated in the demand sector based on fuel prices by acting as a floor level - limiting consumer choices to efficiencies above but not below the floor.

DESTDP (ENDUSE,TECH,EC,YEAR)**: Device Efficiency Standards Policy** (Btu/Btu OR J/J)

DESTD are for standards already in effect such as those included required from federal energy policy. The values are inputs in the *data files. The basecase version of the model includes the current DESTD for any end-use that has one. DESTDP is a policy variable that allows the analyst to test out different standards as policies. Both variables can override the DEE calculated in the demand sector based on fuel prices by acting as a floor level - limiting consumer choices to efficiencies above but not below the floor.

DESTDP (ENDUSE,TECH,EC,YEAR)**: Device Efficiency Standards Policy** (Btu/Btu OR J/J)

DESTD are for standards already in effect such as those included required from federal energy policy. The values are inputs in the *data files. The basecase version of the model includes the current DESTD for any end-use that has one. DESTDP is a policy variable that allows the analyst to test out different standards as policies. Both variables can override the DEE calculated in the demand sector based on fuel prices by acting as a floor level - limiting consumer choices to efficiencies above but not below the floor.

DEURETRO (ENDUSE)**: Device Retrofit Switch**

This switch turns on the device retrofit procedure in the demand sectors.

DEURETRO (ENDUSE)**: Device Retrofit Switch**

This switch turns on the device retrofit procedure in the demand sectors.

DFITC (YEAR)**: Deferred Investment Tax Credits** (M$/YR)

Deferred Investment Tax Credits equals claimed tax credits under normalized accounting.

DFITC (YEAR)**: Deferred Investment Tax Credits** (M$/YR)

Deferred Investment Tax Credits equals claimed tax credits under normalized accounting.

DFTC (ENDUSE,TECH,EC)**: Device Fuel Trade Off Coefficient** (DLESS)

This fuel cost coefficient is used to calculate Consumer Preference Efficiency and Capital Cost Curves(DCCT,DEET). It is calculated in the initial files from the device capital trade off coefficient(DCTC) which in turn is based on fuel prices, capital costs and device efficiencies.

DFTC (ENDUSE,TECH,EC)**: Device Fuel Trade Off Coefficient** (DLESS)

This fuel cost coefficient is used to calculate Consumer Preference Efficiency and Capital Cost Curves(DCCT,DEET). It is calculated in the initial files from the device capital trade off coefficient(DCTC) which in turn is based on fuel prices, capital costs and device efficiencies.

DISF : Disallowed Earnings Fraction (Fraction)

A policy variable used in the regulatory routines to reduce utility earnings.

DISF : Disallowed Earnings Fraction (Fraction)

A policy variable used in the regulatory routines to reduce utility earnings.

DISPORD (DISPATCH)**: Dispatch Order** (1=FIRST)

DISPORD is designed to allow for exogenous loading order specifications. Users can assign plant dispatch order on the basis of whatever criteria is necessary.

DISPORD (DISPATCH)**: Dispatch Order** (1=FIRST)

DISPORD is designed to allow for exogenous loading order specifications. Users can assign plant dispatch order on the basis of whatever criteria is necessary.

DISPSW (YEAR)**: Dispatch Order Switch** (0=USER DEFINED, 1=UNIT FUEL COSTS)

This switch allows an exogenous dispatch order to override the model's default fuel cost criteria.

DISPSW (YEAR)**: Dispatch Order Switch** (0=USER DEFINED, 1=UNIT FUEL COSTS)

This switch allows an exogenous dispatch order to override the model's default fuel cost criteria.

DISPTYPE (DISPATCH)**: Dispatch Type** (1=BASE)

DISTYPE allows additional dispatch types to be included in the dispatch routines.

DISPTYPE (DISPATCH)**: Dispatch Type** (1=BASE)

DISTYPE allows additional dispatch types to be included in the dispatch routines.

DIVTC (YEAR)**: Device Investment Tax Credit** ($/$)

An exogenously specified policy variable used in determining the capital charge rate (CCR). It represents the federal investment tax credit. It has values from 1975 through 1986.

DIVTC (TECH,YEAR)**: Device Investment Tax Credit** ($/$)

Used in the calculation of the device capital charge rate in the short term DSM utilization routine in the demand sector. Reduces the cost of purchasing a specific energy efficient device and therefore reduces the annualized capital cost of the device. Variable is a user-specified input with the values coming from the conservation or DSM program being simulated.

DIVTC (YEAR)**: Device Investment Tax Credit** ($/$)

An exogenously specified policy variable used in determining the capital charge rate (CCR). It represents the federal investment tax credit. It has values from 1975 through 1986.

DIVTC (TECH,YEAR)**: Device Investment Tax Credit** ($/$)

Used in the calculation of the device capital charge rate in the short term DSM utilization routine in the demand sector. Reduces the cost of purchasing a specific energy efficient device and therefore reduces the annualized capital cost of the device. Variable is a user-specified input with the values coming from the conservation or DSM program being simulated.

DLF (PLANT,POWER)**: Design load factor** (FRACTION)

This variable is an estimate of the load factor of various plant types. It is an exogenously specified input used in the calculation of the marginal cost of using energy (MCE).

DLF (PLANT,POWER)**: Design load factor** (FRACTION)

This variable is an estimate of the load factor of various plant types. It is an exogenously specified input used in the calculation of the marginal cost of using energy (MCE).

DM (PLANT,YEAR)**: Depletion Multiplier** ($/$)

The depletion multiplier is a function of the resource base, the generating capacity and the capacity under construction of a particular plant type. The depletion multiplier reflects the fact that some generation technologies require scarce resources for their implementation.

DM (PLANT,YEAR)**: Depletion Multiplier** ($/$)

The depletion multiplier is a function of the resource base, the generating capacity and the capacity under construction of a particular plant type. The depletion multiplier reflects the fact that some generation technologies require scarce resources for their implementation.

DMCFR (RTCLASS,YEAR)**: Frac. of Revenue Allocated to Demand Charge**

The demand charge fraction is a policy variable used to allocate fixed costs between demand charges and unit costs.

DMCFR (RTCLASS,YEAR)**: Frac. of Revenue Allocated to Demand Charge**

The demand charge fraction is a policy variable used to allocate fixed costs between demand charges and unit costs.

DMD (ENDUSE,TECH,EC,YEAR)**: Total Energy Demand** (tBtu/YR OR PJ/YEAR)

Total energy demand is calculated by fuel, economic class and enduse in the enduse demand dynamics procedure in the demand sector. Total demand is based on the calculated device energy requirement modified by budget factors, non-price factors, utilization changes based on the economy, and temperature.

DMD (ENDUSE,TECH,EC,YEAR)**: Total Energy Demand** (tBtu/YR OR PJ/YEAR)

Total energy demand is calculated by fuel, economic class and enduse in the enduse demand dynamics procedure in the demand sector. Total demand is based on the calculated device energy requirement modified by budget factors, non-price factors, utilization changes based on the economy, and temperature.

DMDES (FUEL,YEAR)**: Energy Demand** (tBtu/YEAR)

DMDES (FUEL,YEAR)**: Energy Demand** (tBtu/YEAR)

DMDES (ES,FUEL,YEAR)**: Energy Demand** (tBtu/YR OR PJ/YEAR)

Energy Demand(DMDES) is determined by Device Energy Requirements(DER) and modified by utilization factors such as economic factors(CUF), non-price factors(CERSM) and weather. Energy Demand is calculated in the demand sector and is the major output variable from this sector and is used to drive the supply sectors.

DMDES (ES,FUEL,YEAR)**: Energy Demand** (tBtu/YR OR PJ/YEAR)

Energy Demand(DMDES) is determined by Device Energy Requirements(DER) and modified by utilization factors such as economic factors(CUF), non-price factors(CERSM) and weather.

Energy Demand is calculated in the demand sector and is the major output variable from this sector and is used to drive the supply sectors.

DMDSW (TECH,EC,YEAR)**: EUDEMAND Switch**

If DMDSW is set to exogenous, then DMD and FSDMD are exogenous inputs to the model(set equal to some XDMD or XFSDMD).

DMDSW (TECH,EC,YEAR)**: EUDEMAND Switch**

If DMDSW is set to exogenous, then DMD and FSDMD are exogenous inputs to the model(set equal to some XDMD or XFSDMD).

DOCF (ENDUSE,TECH,EC)**: Device Operating Cost Fraction** (($/YR)/$)

The Device Operating Cost Fraction is computed by dividing O&M costs by capital costs for the base year($1975/mBtu). These O&M costs generally come from ARC 80, pp. 288-289. For gas air conditioners the source is AGA, May 26, 1989,(EA-1989-S), Energy Analysis "An Analysis of the Economies of Gas Engine-Driven Chillers". This fraction is then used to calculated device operation and maintenance costs as a fraction of capital costs used in the future.

DOCF (ENDUSE,TECH,EC)**: Device Operating Cost Fraction** (($/YR)/$)

The Device Operating Cost Fraction is computed by dividing O&M costs by capital costs for the base year($1975/mBtu). These O&M costs generally come from ARC 80, pp. 288-289. For gas air conditioners the source is AGA, May 26, 1989,(EA-1989-S), Energy Analysis "An Analysis of the Economies of Gas Engine-Driven Chillers". This fraction is then used to calculated device operation and maintenance costs as a fraction of capital costs used in the future.

DPAF (DISPATCH,MONTH)**: Plant Availability Fraction** (fraction)

Plants have scheduled maintenance and a history of unscheduled outages. The same is true for the ability to dispatch from a particular plant. This dispatch plant availability factor is a function of the scheduled outage rate and the unscheduled outage rate of each dispatch type.

DPAF (DISPATCH,MONTH)**: Plant Availability Fraction** fraction

Plants have scheduled maintenance and a history of unscheduled outages. The same is true for the ability to dispatch from a particular plant. This dispatch plant availability factor is a function of the scheduled outage rate and the unscheduled outage rate of each dispatch type.

DPIVTC (YEAR)**: Device Policy Investment Tax Credit** ($/$)

DPIVTC is a policy variable used to modify the DCCR(device capital charge rate). The variable value varies with the policy selected.

DPIVTC (YEAR)**: Device Policy Investment Tax Credit** ($/$)

DPIVTC is a policy variable used to modify the DCCR(device capital charge rate). The variable value varies with the policy selected.

DPKM (SEASON,YEAR)**: DAILY Peak Day Multiplier**

DPKM allows for the inclusion of Peak Day Temperature Effects in primary heat load curves. It is a calibrated variable.

DPKM (SEASON,YEAR)**: DAILY Peak Day Multiplier**

DPKM allows for the inclusion of Peak Day Temperature Effects in primary heat load curves. It is a calibrated variable.

DPL (ENDUSE,TECH,EC,YEAR)**: Physical Life of Equipment** (YRS)

Default national data in the *data files is from ARC80; more specific data is preferred. DPL is used to determine the device retirement rate(dividing the number of devices by the DPL yields yearly retirements) in the demand sector. DPLN is the zero year value of DPL and is used in load management calculations.

DPL (SECTOR)**: Physical Life of Equipment** YEARS

DPL (SECTOR)**: Physical Life of Equipment** YEARS

DPL (ENDUSE,TECH,EC,YEAR)**: Physical Life of Equipment** (YRS)

Default national data in the *data files is from ARC80; more specific data is preferred. DPL is used to determine the device retirement rate(dividing the number of devices by the DPL yields yearly retirements) in the demand sector. DPLN is the zero year value of DPL and is used in load management calculations.

DPLN (ENDUSE,TECH,EC,ZERO)**: Physical Life of Equipment** (YRS)

Default national data in the *data files is from ARC80; more specific data is preferred. DPL is used to determine the device retirement rate(dividing the number of devices by the DPL yields yearly retirements) in the demand sector. DPLN is the zero year value of DPL and is used in load management calculations.

DPLN (ENDUSE,TECH,EC,ZERO)**: Physical Life of Equipment** (YRS)

Default national data in the *data files is from ARC80; more specific data is preferred. DPL is used to determine the device retirement rate(dividing the number of devices by the DPL yields

yearly retirements) in the demand sector. DPLN is the zero year value of DPL and is used in load management calculations.

DPRDD (AA,YEAR)**: Accelerated Depreciation Rate** (1/YR)

The accelerated depreciation rate is exogenously specified to reflect changing tax laws.

DPRDD (AA,YEAR)**: Accelerated Depreciation Rate** (1/YR)

The accelerated depreciation rate is exogenously specified to reflect changing tax laws.

DPRICE (EFFI,TECH)**: Energy Price Dimension for Efficiency and Capital Cost Curves** ($/mBtu or $/GJ)

DPRICE values are the X-axis values(20 points) for the Efficiency and Capital Cost Curves. They are calculated in the *initial files and are based on the fuel prices (ECFP).

DPRICE (EFFI,TECH)**: Energy Price Dimension for Efficiency and Capital Cost Curves** ($/mBtu or $/GJ)

DPRICE values are the X-axis values(20 points) for the Efficiency and Capital Cost Curves. They are calculated in the *initial files and are based on the fuel prices (ECFP).

DPRSL (AA,YEAR)**: Straight Line Depreciation Rate** (1/YR)

The depreciation rate is by asset and approximates the reciprocal of the physical lifetime of the aset.

DPRSL (AA,YEAR)**: Straight Line Depreciation Rate** (1/YR)

The depreciation rate is by asset and approximates the reciprocal of the physical lifetime of the asset.

DREV (YEAR)**: Revenue Deficiency** (M$)

Any discrepancy between the allowed rate base income and the projected income must represent taxable income because all expenses are already accounted for in RBOPINC and TYOPINC, the two variables used in the calculation of DREV. Therefore DREV must be reduced by the taxes owed on this income.

DREV (YEAR)**: Revenue Deficiency** (M$)

Any discrepancy between the allowed rate base income and the projected income must represent taxable income because all expenses are already accounted for in RBOPINC and TYOPINC, the two variables used in the calculation of DREV. Therefore DREV must be reduced by the taxes owed on this income.

DRISK (ENDUSE,TECH)**: Device Excess Risk** ($/$)

Device Excess risk(DRISK) is standard DOE risk value and is found in the *data files. It is used in the calculation of the device capital charge rate(DCCR) found in the demand sector.

DRISK : Device Risk Premium (DLESS)

An exogenously specified policy variable used in determining the capital charge rate (CCR).

DRISK : Device Risk Premium (DLESS)

An exogenously specified policy variable used in determining the capital charge rate (CCR).

DRISK (ENDUSE,TECH)**: Device Excess Risk** ($/$)

Device Excess risk(DRISK) is standard DOE risk value and is found in the *data files. It is used in the calculation of the device capital charge rate(DCCR) found in the demand sector.

DRM (POWER)**: Desired Reserve Margin** (MW/MW)

The desired reserve margin is an exogenously specified target added to the demand forecast to calculate the future generation capacity retirements.

DRM (POWER)**: Desired Reserve Margin** (MW/MW)

The desired reserve margin is an exogenously specified target added to the demand forecast to calculate the future generation capacity retirements.

DSOR (DISPATCH,MONTH)**: Scheduled Outage Rate by Dispatch** fraction

An exogenously specified input variable used in the calculation of DPAF.

DSOR (DISPATCH,MONTH)**: Scheduled Outage Rate by Dispatch** fraction

An exogenously specified input variable used in the calculation of DPAF.

DST (ENDUSE,EC,YEAR)**: Device Saturation** (Btu/Btu OR J/J)

Device Saturation(DST) is calculated in demand sectors as function of maximum device saturation, the marginal cost of fuel use, and the process efficiency. The device saturations affect the PERA(process energy requirement additions).

DST (ENDUSE,EC,YEAR)**: Device Saturation** (Btu/Btu OR J/J)

Device Saturation(DST) is calculated in demand sectors as function of maximum device saturation, the marginal cost of fuel use, and the process efficiency. The device saturations affect the PERA(process energy requirement additions).

DST0 (ENDUSE,EC,YEAR)**: Device Saturation** (Btu/Btu OR J/J)

DST0 and DSTI are calibrated variables used in the calculation of DST in the mstock procedure in the demand sector. DSTI captures and translates income effects on device saturation(for example, if consumers have higher incomes they may be more likely to purchase a more costly, but more efficient device). It is a measure of income elasticity with respect to DST. DST0 represents the influence of non-price factors and is derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects.

DST0 (ENDUSE,EC,YEAR)**: Device Saturation** (Btu/Btu OR J/J)

DST0 and DSTI are calibrated variables used in the calculation of DST in the mstock procedure in the demand sector. DSTI captures and translates income effects on device saturation(for example, if consumers have higher incomes they may be more likely to purchase a more costly, but more efficient device). It is a measure of income elasticity with respect to DST. DST0 represents the influence of non-price factors and is derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects.

DSTI (ENDUSE,EC)**: Device Saturation Income Utility** ($/$)

DST0 and DSTI are calibrated variables used in the calculation of DST in the mstock procedure in the demand sector. DSTI captures and translates income effects on device saturation(for example, if consumers have higher incomes they may be more likely to purchase a more costly, but more efficient device). It is a measure of income elasticity with respect to DST. DST0 represents the influence of non-price factors and is derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects.

DSTI (ENDUSE,EC)**: Device Saturation Income Utility** ($/$)

DST0 and DSTI are calibrated variables used in the calculation of DST in the mstock procedure in the demand sector. DSTI captures and translates income effects on device saturation(for example, if consumers have higher incomes they may be more likely to purchase a more costly, but more efficient device). It is a measure of income elasticity with respect to DST. DST0 represents the influence of non-price factors and is derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects.

DSTM (ENDUSE,EC)**: Maximum Device Saturation** (Btu/Btu OR J/J)

DSTM is the maximum device saturation attainable and is a calibrated variable used in the calculation of DST in the mstock procedure of the demand sector.

DSTM (ENDUSE,EC)**: Maximum Device Saturation** (Btu/Btu OR J/J)

DSTM is the maximum device saturation attainable and is a calibrated variable used in the calculation of DST in the mstock procedure of the demand sector.

DSTP (ENDUSE,EC)**: Device Saturation Price Utility** ($/$)

DSTP is a calibrated variable used in the calculation of DST in the demand sector.

DSTP (ENDUSE,EC)**: Device Saturation Price Utility** ($/$)

DSTP is a calibrated variable used in the calculation of DST in the demand sector.

DTL (ENDUSE,TECH,EC)**: Device Tax Life** (YRS)

Device tax life is a normal accounting value and is some fraction of physical life. The input value resides in the data files and it is used in the calculation in the demand sector of DCCR(device capital charge rate).

DTL (SECTOR)**: Device Tax Life** YEARS

DTL (ENDUSE,TECH,EC)**: Device Tax Life** (YRS)

Device tax life is a normal accounting value and is some fraction of physical life. The input value resides in the data files and it is used in the calculation in the demand sector of DCCR(device capital charge rate).

DTL (SECTOR)**: Device Tax Life** YEARS

DTMAP (DISPATCH,TECH)**: Map between Dispatch and Tech**

DTMAP maps plant dispatch to plant technology.

DTMAP (DISPATCH,TECH)**: Map between Dispatch and Tech**

DTMAP maps plant dispatch to plant technology.

DTYPE (DISPATCH)**: Dispatch Type** (0=Normal,1=Peak)

A multiplier used to determine the effective generating capacity. If DTYPE=1 then peak demand is being served and EGC=EGC. If DTYPE=1, then the average demand for power constraint becomes effective (indicating baseload plant) and EGC cannont exceed ADPM.

DTYPE (DISPATCH)**: Dispatch Type** (0=Normal,1=Peak)

A multiplier used to determine the effective generating capacity. If DTYPE=1 then peak demand is being served and EGC=EGC. If DTYPE=1, then the average demand for power constraint becomes effective (indicating baseload plant) and EGC cannot exceed ADPM.

DUCFSW (ENDUSE)**: Daily Use Switch for Loading Cogeneration and Feedstock Demand**

If DUCFSW is set equal to one then cogeneration and feedstock demands are included in the primary heat device load curves. The default values set the DUCFSW equal to one for heat and zero for all other enduses.

DUCFSW (ENDUSE)**: Daily Use Switch for Loading Cogeneration and Feedstock Demand**

If DUCFSW is set equal to one then cogeneration and feedstock demands are included in the primary heat device load curves. The default values set the DUCFSW equal to one for heat and zero for all other enduses.

DUF (SHAPE,LOAD,SEASON)**: Daily Use Factor** (THERM/THERM)

The daily use factor is adjusted to historical values and normalized in the calibration sectors. It is used to convert cogeneration and feedstock demands from annual use to daily use in the gas enduse loadcurve equation in the daily use procedure in the demand sector.

DUF (SHAPE,LOAD,SEASON)**: Daily Use Factor** (THERM/THERM)

The daily use factor is adjusted to historical values and normalized in the calibration sectors. It is used to convert cogeneration and feedstock demands from annual use to daily use in the gas enduse loadcurve equation in the daily use procedure in the demand sector.

DUOR (DISPATCH)**: Unscheduled Outage Rate by Dispatch** fraction

An exogenously specified input variable used in the calculation of DPAF.

DUOR (DISPATCH)**: Unscheduled Outage Rate by Dispatch** fraction

An exogenously specified input variable used in the calculation of DPAF.

ECD (TECH,EC,YEAR)**: Fuel Demand** (tBtu/YR OR GJ/YR)

ECD is total demand by fuel(TECH) and economic class(EC). It is calculated in the total demand procedure in the demand sector and the sum across enduses of demand(DMD), cogeneration demand and feedstock demand.

ECD (TECH,EC,YEAR)**: Fuel Demand** (tBtu/YR OR GJ/YR)

ECD is total demand by fuel(TECH) and economic class(EC). It is calculated in the total demand procedure in the demand sector as the sum across enduses of demand(DMD), cogeneration demand and feedstock demand.

ECDUC (ENDUSE,EC,LOAD,SEASON)**: Gas Enduse Load Curve** (MTHERM/DAY)

The natural gas gross load curve by economic class(EC) is calculated in the Gas Daily Use Procedure in the demand sector. It includes cogeneration and feedstock demands as well as temperature effects.

ECDUC (ENDUSE,EC,LOAD,SEASON)**: Gas Enduse Load Curve** (MTHERM/DAY)

The natural gas gross load curve by economic class(EC) is calculated in the Gas Daily Use Procedure in the demand sector. It includes cogeneration and feedstock demands as well as temperature effects.

ECFP (TECH,EC,YEAR)**: Fuel Price** ($/mBtu or $/GJ)

The enduse fuel price is the average annual price except for space heating which uses the winter price and air conditioning which uses the summer price. It is calculated in the TPRICE procedure in the demand sector from global prices(FP) and any local taxes(ECFPSM). ECFP0 are first year prices.

ECFP (TECH,EC,YEAR)**: Fuel Price** ($/mBtu or $/GJ)

The enduse fuel price is the average annual price except for space heating which uses the winter price and air conditioning which uses the summer price. It is calculated in the TPRICE procedure in the demand sector from global prices(FP) and any local taxes(ECFPSM). ECFP0 are first year prices.

ECFP0 (TECH,EC,FIRST)**:** **Fuel Price** ($/mBtu or $/GJ)

The enduse fuel price is the average annual price except for space heating which uses the winter price and air conditioning which uses the summer price. It is calculated in the TPRICE procedure in the demand sector from global prices(FP) and any local taxes(ECFPSM). ECFP0 are first year prices.

ECFP0 (TECH,EC,FIRST)**:** **Fuel Price** ($/mBtu or $/GJ)

The enduse fuel price is the average annual price except for space heating which uses the winter price and air conditioning which uses the summer price. It is calculated in the TPRICE procedure in the demand sector from global prices(FP) and any local taxes(ECFPSM). ECFP0 are first year prices.

ECFP0SM (TECH,EC,FIRST)**:** **Sales Tax** ($/$)

Sales tax is a user specified, state specific variable with a default value of zero. Source of data is state tax codes. Used in the TPRICE procedure in the demand sector to convert global fuel prices to local prices. ECFP0SM are first year taxes.

ECFP0SM (TECH,EC,FIRST)**:** **Sales Tax** ($/$)

Sales tax is a user specified, state specific variable with a default value of zero. Source of data is state tax codes. Used in the TPRICE procedure in the demand sector to convert global fuel prices to local prices. ECFP0SM are first year taxes.

ECFPSM (TECH,EC,YEAR)**:** **Sales Tax** ($/$)

Sales tax is a user specified, state specific variable with a default value of zero. Source of data is state tax codes. Used in the TPRICE procedure in the demand sector to convert global fuel prices to local prices. ECFP0SM are first year taxes.

ECFPSM (TECH,EC,YEAR)**:** **Sales Tax** ($/$)

Sales tax is a user specified, state specific variable with a default value of zero. Source of data is state tax codes. Used in the TPRICE procedure in the demand sector to convert global fuel prices to local prices. ECFP0SM are first year taxes.

ECLDC (ENDUSE,EC,LOAD,SEASON)**:** **Load Curve by Economic Category** (MW)

The load curve by economic category is a seasonal load shape by enduse and economic category calculated in the loadcurve procedure in the demand sector. ECLDC is a function of the demand by economic category(DMD) shaped by a load shape factor(LSF) and further modified by any policies such as time of use rates.

ECLDC (ENDUSE,EC,LOAD,SEASON)**: Load Curve by Economic Category** (MW)

The load curve by economic category is a seasonal load shape by enduse and economic category calculated in the loadcurve procedure in the demand sector. ECLDC is a function of the demand by economic category(DMD) shaped by a load shape factor(LSF) and further modified by any policies such as time of use rates.

ECOST (SECTOR,YEAR)**: Energy Cost per Dollar of Output** ($/$)

ECOST is calculated in the total demand procedure of the demand sector as the product of local fuel price per mBtu and the energy demand divided by the total output of the region being modeled.

ECOST (SECTOR,YEAR)**: Energy Cost per Dollar of Output** ($/$)

ECOST is calculated in the total demand procedure of the demand sector as the product of local fuel price per mBtu and the energy demand divided by the total output of the region being modeled.

ECOSTS (SECTOR,FUEL,YEAR)**: Energy Costs** (M$/YR)

Energy costs are also calculated in the total demand procedure of the demand sector as the product of local fuel price per mBtu and the energy demand for each fuel in each sector.

ECOSTS (SECTOR,FUEL,YEAR)**: Energy Costs** (M$/YR)

Energy costs are also calculated in the total demand procedure of the demand sector as the product of local fuel price per mBtu and the energy demand for each fuel in each sector.

ECSALES (EC,YEAR)**: Electricity Sales by Economic Category** (GWH/YR)

ECSALES are calculated in the loadcurve procedure in the demand sector as the sum across enduses of ESALES - sales by enduse and economic class. ESALES is defined as the sum of the product of the value of average economic class load duration curve and the number of hours by enduse, season and economic class.

ECSALES (EC,YEAR)**: Electricity Sales by Economic Category** (gWh/YR)

ECSALES are calculated in the loadcurve procedure in the demand sector as the sum across enduses of ESALES - sales by enduse and economic class. ESALES is defined as the sum of the product of the value of average economic class load duration curve and the number of hours by enduse, season and economic class.

ECUF (ECC,YEAR)**: Capital Utilization Fraction** (Btu/Btu OR GJ/GJ)

This calibrated variable measures the effects of the economy on the residential, commercial, and industrial sectors. For the residential sector, this adjustment picks up large changes in the employment rate; in the commercial sector, unusual changes in commercial output are the key and in the industrial sector, it is a measure of how hard factories are running. During recessionary periods, the value of ECUF is less than one; during very good times, greater than one.

ECUF (ECC,YEAR)**: Capital Utilization Fraction** (Btu/Btu OR GJ/GJ)

This calibrated variable measures the effects of the economy on the residential, commercial, and industrial sectors. For the residential sector, this adjustment picks up large changes in the employment rate; in the commercial sector, unusual changes in commercial output are the key and in the industrial sector, it is a measure of how hard factories are running. During recessionary periods, the value of ECUF is less than one; during very good times, greater than one.

EECONV (YEAR)**: Electric Energy Conversion** KJ/kWh

EECONV : Electric Energy Conversion (Btu/kWh OR GJ/kWh)

Standard engineering value from national data. Used to covert Btu to kWh throughout the model.

EECONV (YEAR)**: Electric Energy Conversion** KJ/kWh

EECONV : Electric Energy Convertion (Btu/kWh OR GJ/kWh)

Standard engineering value from national data. Used to covert Btu to kWh throughout the model.

EFRQ (PLANT,YEAR)**: Embodied Fuel Requirement** (Btu/HOUR)

The embodied fuel requirements are the integral of new capacity (GCCR) times the marginal heat rate less any retirements (GCR).

EFRQ (PLANT,YEAR)**: Embodied Fuel Requirement** (Btu/HOUR)

The embodied fuel requirements are the integral of new capacity (GCCR) times the marginal heat rate less any retirements (GCR).

EG (PLANT,YEAR)**: Electricity Generated** (gWh/YR)

The electricity generated by plant each year is calculated from the effective generation by plant and season, summed over season

EG (PLANT,YEAR)**: Electricity Generated** (GWH/YR)

The electricity generated by plant each year is calculated from the effective generation by plant and season, summed over season

EGC : Effective Generating Capacity

The model uses the derating method to dispatch plants. The derating method uses the scheduled and unscheduled outage rates in an arbitrary time interval to develop effective firm generating capacity from total generating capacity for each plant type during that time interval

EGC : Effective Generating Capacity

The model uses the derating method to dispatch plants. The derating method uses the scheduled and unscheduled outage rates in an arbitrary time interval to develop effective firm generating capacity from total generating capacity for each plant type during that time interval

EGP (DISPATCH,MONTH,YEAR)**: Electricity Dispatched** (gWh/YR)

Given the calculated EGC, the models dispatches plants and purchases power in the order of increasing costs. Electricity dispatched by season is a function of the effective generating capacity times the fraction of the time the capacity can be used.

EGP (DISPATCH,MONTH,YEAR)**: Electricity Dispatched** (GWH/YR)

Given the calculated EGC, the models dispatches plants and purchases power in the order of increasing costs. Electricity dispatched by season is a function of the effective generating capacity times the fraction of the time the capacity can be used.

EIM (TECH,EC,YEAR)**: Energy Intensity Multiplier** (Btu/Btu OR GJ/GJ)

EIM measures cross enduse impacts. Cross enduse impacts affect the size(volume) of energy needs by altering the process efficiency(PEE) but do not alter fuel choice. For example, large lighting requirements may cause an increase in air conditioning load(an increase in volume) but would not instigate a switch to natural gas air conditioning. EIM is calculated in the cross enduse impacts procedure in the demand sector from process efficiencies, a measure of loss intensity and a calibrated cross impact factor. If the process switch called cimpact is not equal to "endogenous" then the EIM defaults to one.

EIM (TECH,EC,YEAR)**: Energy Intensity Multiplier** (Btu/Btu OR GJ/GJ)

EIM measures cross enduse impacts. Cross enduse impacts affect the size(volume) of energy needs by altering the process efficiency(PEE) but do not alter fuel choice. For example, large lighting requirements may cause an increase in air conditioning load(an increase in volume) but would not instigate a switch to natural gas air conditioning. EIM is calculated in the cross enduse impacts procedure in the demand sector from process efficiencies, a measure of loss intensity and a calibrated cross impact factor. If the process switch called cimpact is not equal to "endogenous" then the EIM defaults to one.

ELAS (ENDUSE,LOAD,XLOAD)**: TOU Rate Elasticity** (Dless)

Used to calculate endogenous electric Time-Of-Use rate impacts in the procedure ETOU in the demand sector. It is a price elasticity which modifies the impact of lower time of use rates on customer participation at each point on the loadcurve(PEAK, AVERAGE, MINIMUM). Data is usually national, from economic studies. Customer specific data is preferred, such as utility surveys; default value is zero.

ELAS (ENDUSE,LOAD,XLOAD)**: TOU Rate Elasticity** (Dless)

Used to calculate endogenous electric Time-Of-Use rate impacts in the procedure ETOU in the demand sector. It is a price elasticity which modifies the impact of lower time of use rates on customer participation at each point on the loadcurve(PEAK, AVERAGE, MINIMUM). Data is usually national, from economic studies. Customer specific data is preferred, such as utility surveys; default value is zero.

ELDC : End-use Load Duration Curve

The end-use load duration curve by class, season, and load shape classification is the "DMD" (demand coming from the demand sectors) multiplied by the respective load shape factors and adjusted for weather effects. When summed over end-uses, ELDC becomes the class load duration curve (CLDC). This process translates the DMD or the customer's need for electricity to CLDC, the demand the utility experiences.

ELDC : End-use Load Duration Curve

The end-use load duration curve by class, season, and load shape classification is the "DMD" (demand coming from the demand sectors) multiplied by the respective load shape factors and adjusted for weather effects. When summed over end-uses, ELDC becomes the class load duration curve (CLDC). This process translates the DMD or the customer's need for electricity to CLDC, the demand the utility experiences.

ENMSM (FUEL,YEAR)**: Energy Supply Constraint Multiplier** (Btu/Btu or GJ/GJ)

The Energy Supply Constraint Multiplier is found in the supply sector. It can be altered by fuel to reflect temporary or permanent deviations from current levels. Summed over fuels, the variable becomes TENMSM used to modify the market allocation weights(MAW) used in the calculation of the market share fractions in the demand sector. The default value is equal to one which means there are no additional constraints on the energy supply.

ENMSM (FUEL,YEAR)**: Energy Supply Constraint Multiplier** Btu/Btu

ENMSM (FUEL,YEAR)**: Energy Supply Constraint Multiplier** (Btu/Btu or GJ/GJ)

The Energy Supply Constraint Multiplier is found in the supply sector. It can be altered by fuel to reflect temporary or permanent deviations from current levels. Summed over fuels, the variable becomes TENMSM used to modify the market allocation weights(MAW) used in the calculation of the market share fractions in the demand sector. The default value is equal to one which means there are no additional constraints on the energy supply.

ENMSM (FUEL,YEAR)**: Energy Supply Constraint Multiplier** bTu/Btu

ENPN (FUEL,YEAR)**: Primary Fuel Price** $/mBtu

ENPN (FUEL,YEAR)**: Primary Fuel Price** $/mBtu

ERMARGIN (YEAR)**: Extended Reserve Margin** (Frac.)

The reserve margin is calculated as the total generating capacity divided by the peak (MW) in the peak season minus 1.0. If Regional interchange agreements are included then it is called the extended reserve margin.

ERMARGIN (YEAR)**: Extended Reserve Margin** (Frac.)

The reserve margin is calculated as the total generating capacity divided by the peak MW in the peak season minus 1.0. If Regional interchange agreements are included then it is called the extended reserve margin.

ERTC (YEAR)**: Earned Investment Tax Credit** (M$)

As investments enter gross assets (CWGAA), investment tax credits (ERTC) are earned at the tax credit rate (TCR).

ERTC (YEAR)**: Earned Investment Tax Credit** (M$)

As investments enter gross assets (CWGAA), investment tax credits (ERTC) are earned at the tax credit rate (TCR).

ERVADJ (YEAR)**: Revenue Adjustment** (M$/YR)

The revenue adjustment is an exogenous revenue adjustment that captures unique or negotiated adjustment to the allowed revenues (AREV).

ERVADJ (YEAR)**: Revenue Adjustment** (M$/YR)

The revenue adjustment is an exogeous revenue adjustment that captures unique or negotiated adjustment to the allowed revenues (AREV).

ESALES (ENDUSE,EC,YEAR)**: Electricity Sales** (GWH/YR)

Sales by enduse and EC are calculated in the loadcurve procedure in the demand sector as ESALES. ESALES are calculated simply as the product of ECLDC and HOURS.

ESALES (ENDUSE,EC,YEAR)**: Electricity Sales** (gWh/YR)

Sales by enduse and EC are calculated in the loadcurve procedure in the demand sector as ESALES. ESALES are calculated simply as the product of ECLDC and HOURS.

EUD : Seasonal Fuel Demand

Seasonal fuel demand is the generation multipled by the heat rate and adjusted by a calibrated correction for engineering and operations constraints.

EUD : Seasonal Fuel Demand

Seasonal fuel demand is the generation multiplied by the heat rate and adjusted by a calibrated correction for engineering and operations constraints.

EUDADD (FUEL,YEAR)**: Electric Utility Demand Additions** (tBtu/YEAR)

EUDADD is a function of the new generating capacity and the heat rate of the new plants (the marginal rate HRTM).

EUDADD (FUEL,YEAR)**: Electric Utility Demand Additions** (tBtu/YEAR)

EUDADD is a function of the new generating capacity and the heat rate of the new plants (the marginal rate HRTM).

EUDMAX (FUEL,YEAR)**: Electric Utility Demand Maximum** (tBtu/YEAR)

The maximum fuel demand is the theoretical upper limit of possible fuel demand assuming all of the plants operated continuously. It is a function of the generation capacity by fuel and the average heat rate summed over all of the plants that use each fuel.

EUDMAX (FUEL,YEAR)**: Electric Utility Demand Maximum** (tBtu/YEAR)

The maximum fuel demand is the theoretical upper limit of possible fuel demand assuming all of the plants operated continuously. It is a function of the generation capacity by fuel and the average heat rate summed over all of the plants that use each fuel.

EUDMD (PLANT,YEAR)**: Utility Fuel Demand** (tBtu/YR)

The utility's demand for fuel is a function of the electricity generated and the average heat rate, adjusted by a multiplier that captures losses and other fuel demands, if any.

EUDMD (PLANT,YEAR)**: Utility Fuel Demand** (tBtu/YR)

The utility's demand for fuel is a function of the electricity generated and the average heat rate, adjusted by a multiplier that captures losses and other fuel demands, if any.

EUDRET (FUEL,YEAR)**: Electric Utility Demand Retirements** (tBtu/YEAR)

The maximum fuel demand of the retired plants is a function of the generation capacity of the retired plants and the average heat rate.

EUDRET (FUEL,YEAR)**: Electric Utility Demand Retirements** (tBtu/YEAR)

The maximum fuel demand of the retired plants is a function of the generation capacity of the retired plants and the average heat rate.

EUFP (PLANT)**: Fuel Prices for Electric Utility** ($/mBtu

This is the effective price of fuel burning in utility plants. It is calculated from fuel prices, engineering constraints and a variance factor.

EUFP (PLANT)**: Fuel Prices for Electric Utility** ($/mBtu)

This is the effective price of fuel burning in utility plants. It is calculated from fuel prices, engineering constraints and a variance factor.

EUFVF : Fungible Market Share Variance Factor (DLESS)

Used in calculating the effective price of fuel, the fungible market share variance factor is applied to fuel prices to simulate the perceived fuel prices in the market.

EUFVF : Fungible Market Share Variance Factor (DLESS)

Used in calculating the effective price of fuel, the fungible market share variance factor is applied to fuel prices to simulate the perceived fuel prices in the market.

EUGAS (YEAR)**: Firm Electric Utility Gas Demand** (tBtu/YEAR)

EUGAS (YEAR)**: Firm Electric Utility Gas Demand** (tBtu/YEAR)

EUODM (PLANT)**: Electric Utility Fuel Multiplier** (PLANT)

A multiplier that captures losses and other fuel demands used in the calculation of a utility's demand for fuel (EUDMD).

EUODM (PLANT)**:** **Electric Utility Fuel Multiplier** (PLANT)

A multiplier that captures losses and other fuel demands used in the calculation of a utility's demand for fuel (EUDMD).

EUOFM (YEAR)**:** **OIL Fraction Multiplier** (Fraction)

The EUOFM represents engineering constraints on the potential for oil and gas fuel switching at plants. It is a calibrated variable but is assumed to be minimal in future years.

EUOFM (YEAR)**:** **OIL Fraction Multiplier** (Fraction)

The EUOFM represents engineering constraints on the potential for oil and gas fuel switching at plants. It is a calibrated variable but is assumed to be minimal in future years.

EUOPM (PLANT,YEAR)**:** **Operational Multiplier**

EUOPM is a calibrated correction to fuel demand for heat rate fluctuations doe to partial valve settings and start-ups and shut-sowns.

EUOPM (PLANT,YEAR)**:** **Operational Multiplier**

EUOPM is a calibrated correction to fuel demand for heat rate fluctuations doe to partial valve settings and start-ups and shut-downs.

EUPC (ENDUSE,TECH,AGE,EC,YEAR)**:** **Production Capacity by Enduse** (M$/YR)

Calculated in the TSTOCK procedure in the demand sector, EUPC is the stock of production capacity which is modified by additions(EUPCA) and retirements(EUPCR) on a yearly basis. This variable forms the basis for determining the process energy requirements(PER) in the model.

EUPC (ENDUSE,TECH,AGE,EC,YEAR)**:** **Production Capacity by Enduse** (M$/YR)

Calculated in the TSTOCK procedure in the demand sector, EUPC is the stock of production capacity which is modified by additions(EUPCA) and retirements(EUPCR) on a yearly basis. This variable forms the basis for determining the process energy requirements(PER) in the model.

EUPCA (ENDUSE,TECH,AGE,EC,YEAR)**:** **Production Capacity Additions** ((M$/YR)/YR)

Production capacity additions(EUPCA) is a function of investments in production capacity(PCA) and marginal fuel shares(MSF). The total additions to production capacity are split into fuel shares using the MSF. It is calculated in the demand sector and is used in the determination of the process efficiency additions(PERA).

EUPCA (ENDUSE,TECH,AGE,EC,YEAR)**: Production Capacity Additions** ((M$/YR)/YR)

Production capacity additions(EUPCA) is a function of investments in production capacity(PCA) and marginal fuel shares(MSF). The total additions to production capacity are split into fuel shares using the MSF. It is calculated in the demand sector and is used in the determination of the process efficiency additions(PERA).

EUPCR (ENDUSE,TECH,AGE,EC)**: Production Capacity Retirement** ((M$/YR)/YR)

This variable tracks capital stock failure and wearout. Production capacity retirements depend on Production Capacity Lifetime(PCPL) and are withdrawn from the third capacity level. It is calculated in the demand sector and is used in the determination of the process efficiency retirements(PERRP).

EUPCR (ENDUSE,TECH,AGE,EC)**: Production Capacity Retirement** ((M$/YR)/YR)

This variable tracks capital stock failure and wearout. Production capacity retirements depend on Production Capacity Lifetime(PCPL) and are withdrawn from the third capacity level. It is calculated in the demand sector and is used in the determination of the process efficiency retirements(PERRP).

EUTEFLAG (ENDUSE,TECH)**: Enduse and TECH flag**

EUTEFLAG (ENDUSE,TECH)**: Enduse and TECH flag**

EX (SECTOR,FUEL,YEAR)**: Expenditures** (M$/YR)

Calculated in the DSMPOST procedure in the demand sector, capital expenditures(EX) are a function of the process and device capital costs less any rebates for both the high efficiency purchases and others. These purchases include both new and retrofits.

EX (SECTOR,FUEL,YEAR)**: Expenditures** (M$/YR)

Calculated in the DSMPOST procedure in the demand sector, capital expenditures(EX) are a function of the process and device capital costs less any rebates for both the high efficiency purchases and others. These purchases include both new and retrofits.

EXCAP (YEAR)**: Excess Regional Generating Capacity** (MW/MW)

An exogenously specified input variable included in the calculation of electric generating capacity (EGC).

EXCAP (YEAR)**: Excess Regional Generating Capacity** (MW/MW)

An exogenously specified input variable included in the calculation of electric generating capacity (EGC).

FADP (YEAR)**: Future Average Demand for Power** (MW)

The future average demand for power is determined by summing across months the monthly output (MONOUT) and converting it to megawatts (MW). It is calculated in the load forecast procedure in the electric sector.

FADP (HORIZON,YEAR)**: Future Average Demand for Power** (MW)

There are four extrapolation methods used to derive FADP. Most use the smoothing functions and one or smoothing constants to grow demand in the future. FADP may also be exogenously specified.

FADP (HORIZON,YEAR)**: Future Average Demand for Power** (MW)

There are four extrapolation methods used to derive FADP. Most use the smoothing functions and one or smoothing constants to grow demand in the future. FADP may also be exogenously specified.

FADP (YEAR)**: Future Average Demand for Power** (MW)

The future average demand for power is determined by summing across months the monthly output (MONOUT) and converting it to megawatts (MW). It is calculated in the loadforecast procedure in the electric sector.

FC (PLANT,YEAR)**: Fuel Cost** (M$/YR)

Total fuel costs by plant equal unit fuel costs multiplied by generation.

FC (PLANT,YEAR)**: Fuel Cost** (M$/YR)

Total fuel costs by plant equal unit fuel costs multiplied by generation.

FCR (POWER,YEAR)**: Forecast of Generating Cap. Retirements** (MW)

The capacity retirements are simply the sum over plants and year of retirements by type.

FCR (POWER,YEAR)**: Forecast of Generating Cap. Retirements** (MW)

The capacity retirements are simply the sum over plants and year of retirements by type.

FCWRB (YEAR)**: Fraction of CWIP in Rate Base** (DLESS)

Utilityies, in general, cannot collect a return on funds used for construction until after the plant is completed. However, occassionally construction work will be allowed in the rate base before the plant comes on line. The exogenously specified fraction of CWIP in Rate Base splits of constructiion work so allowed from AFGS.

FCWRB (YEAR)**: Fraction of CWIP in Rate Base** (DLESS)

Utilities, in general, cannot collect a return on funds used for construction until after the plant is completed. However, occasionally construction work will be allowed in the rate base before the plant comes on line. The exogenously specified fraction of CWIP in Rate Base splits of construction work so allowed from AFGS.

FDBS (YEAR)**: Funds from Business** (M$/YR)

Usable funds from the business equal funds from operations less preferred stock dividends and common stock dividends.

FDBS (YEAR)**: Funds from Business** (M$/YR)

Usable funds from the business equal funds from operations less preferred stock dividends and common stock dividends.

FDCC (ENDUSE,TECH,CTECH)**: Fixed Device Capital Cost** ($/(mBtu/YR) or $/(GJ/YR))

A user-specified input used in the calculation of fuel conversions in the demand sector. National data sources.

FDCC (ENDUSE,TECH,CTECH)**: Fixed Device Capital Cost** ($/(mBtu/YR) or $/(GJ/YR))

A user-specified input used in the calculation of fuel conversions in the demand sector. National data sources.

FDCCU (ENDUSE,TECH,CTECH,YEAR)**: Conversion Rebate**

A user-specified policy variable used in the calculation of fuel conversions in the demand sector. Data values can be found in the policy parameters being simulated.

FDCCU (ENDUSE,TECH,CTECH,YEAR)**: Conversion Rebate**

A user-specified policy variable used in the calculation of fuel conversions in the demand sector. Data values can be found in the policy parameters being simulated.

FDMD (ENDUSE,TECH,CTECH,EC,YEAR)**: Total Energy Demand** (tBtu/YR OR GJ/YR)

Total fungible demand(FDMD) equals the base demand(DMD) times the fraction of the fungible demand captured by each fuel(FMSF) constrained by the maximum fungible demand between any two fuels(FMAX). Values are calculated in the fungible demand procedure in the demand sector.

FDMD (ENDUSE,TECH,CTECH,EC,YEAR)**: Total Energy Demand** (tBtu/YR OR GJ/YR)

Total fungible demand(FDMD) equals the base demand(DMD) times the fraction of the fungible demand captured by each fuel(FMSF) constrained by the maximum fungible demand between any two fuels(FMAX). Values are calculated in the fungible demand procedure in the demand sector.

FDMDES (ES,FUEL,YEAR)**: Fungible Energy Demand** (tBtu/YR OR GJ/YR)

Fungible demands by sector(FDMDES) equals fungible demands(FDMD) summed over all fuels for fuels which are not the same and summed over all enduses. Values are calculated in the fungible demand procedure in the demand sector.

FDMDES (ES,FUEL,YEAR)**: Fungible Energy Demand** (tBtu/YR OR GJ/YR)

Fungible demands by sector(FDMDES) equals fungible demands(FDMD) summed over all fuels for fuels which are not the same and summed over all enduses. Values are calculated in the fungible demand procedure in the demand sector.

FDMDES (FUEL,YEAR)**: Fungible Energy Demand** (tBtu/YEAR)

The gas fungible energy demand is equal to oil and gas steam, oil and gas combined cycle and oil/gas demand all multiplied by the fraction of oil and gas that is gas.

FDMDES (FUEL,YEAR)**: Fungible Energy Demand** ((tBtu/YEAR))

The gas fungible energy demand is equal to oil and gas steam, oil and gas combined cycle and oil/gas demand all multiplied by the fraction of oil and gas that is gas.

FDMDEU (ENDUSE)**: Fungible Switch**

When selected, allows the model to simulate fungible demands for certain enduses.

FDMDEU (ENDUSE)**: Fungible Switch**

When selected, allows the model to simulate fungible demands for certain enduses.

FDOP (YEAR)**: Funds from Operations** (M$/YR)

Funds from operations as reported in the "Sources and Use of Funds" portion of annual reports equal net income plus straight line depreciation, less the difference between taxes paid and taxes reported, less the unrealized AFC, plus the nuclear fuel costs paid in previous years but recorded in the year of use.

FDOP (YEAR)**: Funds from Operations** (M$/YR)

Funds from operations as reported in the "Sources and Use of Funds" portion of annual reports equal net income plus straight line depreciation, less the difference between taxes paid and taxes reported, less the unrealized AFC, plus the nuclear fuel costs paid in previous years but recorded in the year of use.

FFX (LV12)**: X-AXIS Construction Level Cost Frac. Table** (DLESS)

FFX is the "X" axis of the construction cost fraction table - the number of years of construction. From this table yearly construction costs are determined. Incremental costs tend to be lower initially and rise as the actual construction is undertaken.

FFX (LV12)**: X-AXIS Construction Level Cost Frac. Table** (DLESS)

FFX is the "X" axis of the construction cost fraction table - the number of years of construction. From this table yearly construction costs are determined. Incremental costs tend to be lower initially and rise as the actual construction is undertaken.

FFY (LV12)**: Y-AXIS Construction Level Cost Frac. Table** (DLESS)

FFY is the "Y" axis of the construction level cost fraction table indicating the fraction of total cost incurred during construction. From this table yearly construction costs are determined. Incremental costs tend to be lower initially and rise as the actual construction is undertaken.

FFY (LV12)**: Y-AXIS Construction Level Cost Frac. Table** (DLESS)

FFY is the "Y" axis of the construction level cost fraction table indicating the fraction of total cost incurred during construction. From this table yearly construction costs are determined. Incremental costs tend to be lower initially and rise as the actual construction is undertaken.

FGC (POWER,YEAR)**: Future Generation Capacity** (MW)

Future generation capacity is calculated two ways - for baseload capacity and peaking. The required future base load capacity is the future generation capacity requirements increased by the minimum reserve margin. The total capacity needed on peak is the future peak demand for power increased by the minimum reserve margin.

FGC (POWER,YEAR)**: Future Generation Capacity** (MW)

Future generation capacity is calculated two ways - for baseload capacity and peaking. The required future base load capacity is the future generation capacity requirements increased by the minimum reserve margin. The total capacity needed on peak is the future peak demand for power increased by the minimum reserve margin.

FGCR : Future Generation Capacity Requirements

FGCR is MILP when determining new base-load plant construction. It is the value in megawatts that MILD represents on the load curve and is the load that must be satisfied by base- or intermediate-load plants.

FGCR : Future Generation Capacity Requirements

FGCR is MILP when determining new base-load plant construction. It is the value in megawatts that MILD represents on the load curve and is the load that must be satisfied by base- or intermediate-load plants.

FGCRQ (POWER,YEAR)**: Future Generation Capacity Requirements** (MW)

The future capacity requirements for each power type are equal to the maximum demand to be satisfied by the power type times the desired reserve margin. After the first (baseload) power type the capacity requirements are the difference bwtween the maximum demand for the current power type and the maximum demand of the previous power type.

FGCRQ (POWER,YEAR)**: Future Generation Capacity Requirements** (MW)

The future capacity requirements for each power type are equal to the maximum demand to be satisfied by the power type times the desired reserve margin. After the first (baseload) power type the capacity requirements are the difference between the maximum demand for the current power type and the maximum demand of the previous power type.

FHOURS (MONTH)**: Fraction Hours of Year**

This exogenously specified variable represents the fraction of hours in each month. The fractions are based on 8760 hours in a year.

FHOURS (MONTH)**: Fraction Hours of Year**

This exogenously specified variable represents the fraction of hours in each month. The fractions are based on 8760 hours in a year.

FINCOUNT : Counter for Financial Loop

Counts the number of iterations made in the financial loop during the convergence procedure.

FINCOUNT : Counter for Financial Loop

Counts the number of iterations made in the financial loop during the convergence procedure.

FINERR : Error Check for Financial Loop

Error is re-initialized to income before common stock dividends are paid, plus the dividend payments. At the end of the loop, this value will be compared to the same.

FINERR : Error Check for Financial Loop

Error is re-initialized to income before common stock dividends are paid, plus the dividend payments. At the end of the loop, this value will be compared to the same.

FINMAX : Maximum Value for Financial Loop Counter

An exogenously specified number of iterations allowed before the model stops trying to converge.

FINMAX : Maximum Value for Financial Loop Counter

An exogenously specified number of iterations allowed before the model stops trying to converge.

FMAX (ENDUSE,TECH,EC)**: Maximum Fungible Fraction** (Btu/Btu OR GJ/GJ)

In the fungible procedure, all demands are placed in FDMD. The non-fungible portion is equal to the base demand(DMD) times one minus the maximum fungible(FMAX). A zero(default value) implies that there are no fungible demands.

FMAX (ENDUSE,TECH,EC)**: Maximum Fungible Fraction** (Btu/Btu OR GJ/GJ)

In the fungible procedure, all demands are placed in FDMD. The non-fungible portion is equal to the base demand(DMD) times one minus the maximum fungible(FMAX). A zero(default value) implies that there are no fungible demands.

FMDP (HORIZON,YEAR)**: Future Minimum Demand for Power** (MW)

There are four extrapolation methods used to derive FMDP. Most use the smoothing functions and one or smoothing constants to grow demand in the future. FMDP may also be exogenously specified.

FMDP (HORIZON,YEAR)**: Future Minimum Demand for Power** (MW)

There are four extrapolation methods used to derive FMDP. Most use the smoothing functions and one or smoothing constants to grow demand in the future. FMDP may also be exogenously specified.

FMDS (POWER,HORIZON,YEAR)**: Forecast of Maximum Demand** (MW)

The forecast of the maximum demand satisfied by each power type (peak, intermediate and baseload) is a function of the forecast of the load duration curve and the minimum number of hours for each power type.

FMDS (POWER,HORIZON,YEAR)**: Forecast of Maximum Demand** (MW)

The forecast of the maximum demand satisfied by each power type (peak, intermediate and baseload) is a function of the forecast of the load duration curve and the minimum number of hours for each power type.

FMGC (POWER,YEAR)**: Future Misc. Generating Capacity** (MW)

Miscellaneous types of capacity available in the future include firm power purchases, qualified facilities, excess regional power, and interruptible load for peak power.

FMGC (POWER,YEAR)**: Future Misc. Generating Capacity** (MW)

Miscellaneous types of capacity available in the future include firm power purchases, qualified facilities, excess regional power, and interruptible load for peak power.

FMSF (ENDUSE,TECH,CTECH,EC,YEAR)**: Fungible Market Share Fraction by Device** ($/$)

Fungible market shares are calculated in the fungible procedure in the demand sector in the same manner as MMSF - as a function fuel prices, income and other effects(see MMSF). If the process switch -fungible is set equal to exogenous, then FMSF is not calculated in the demand sector but set equal to exogenous values XFMSF.

FMSF (ENDUSE,TECH,CTECH,EC,YEAR)**: Fungible Market Share Fraction by Device** ($/$)

Fungible market shares are calculated in the fungible procedure in the demand sector in the same manner as MMSF - as a function fuel prices, income and other effects(see MMSF). If the process switch -fungible is set equal to exogenous, then FMSF is not calculated in the demand sector but set equal to exogenous values XFMSF.

FMSM0 (ENDUSE,TECH,CTECH,EC,YEAR)**: Market Share Multiplier Constraint** ($/$)

The non-price factors(FMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. FMSM0 is used to modify the fungible market allocation weight which is used to determine the fungible market share for each fuel in the demand sector.

FMSM0 (ENDUSE,TECH,CTECH,EC,YEAR)**: Market Share Multiplier Constraint** ($/$)

The non-price factors(FMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. FMSM0 is used to modify the fungible market allocation weight which is used to determine the fungible market share for each fuel in the demand sector.

FMSMI (ENDUSE,TECH,CTECH,EC,YEAR)**: Market Share Multiplier from Income** ($/$)

The FMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The FMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs.

FMSMI (ENDUSE,TECH,CTECH,EC,YEAR)**: Market Share Multiplier from Income** ($/$)

The FMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The FMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs.

FN (YEAR)**: Financing Rate** (M$/YR)

Financing for the year is composed of all funds acquired from selling bonds, new indebtedness, or issuing stock or all the excess funds distributed to extra debt payments or purchasing bonds or common stock. The variable is computed such that the financing as funds acquired minus funds distributed guarantees that the total financing is positive if additional funds had to be acquired and negative if excess funds were distributed.

FN (YEAR)**: Financing Rate** (M$/YR)

Financing for the year is composed of all funds acquired from selling bonds, new indebtedness, or issuing stock or all the excess funds distributed to extra debt payments or purchasing bonds or common stock. The variable is computed such that the financing as funds acquired minus funds distributed guarantees that the total finacing is positive if additional funds had to be acquired and negative if excess funds were distributed.

FNRQ (YEAR)**: Financing Required** (M$)

The utility must finance total construction work in progress (TCW), debt repayments (DBRP), capacity capital additions (GCAD), preferred stock sinking funds (PSSF), nuclear fuel pruchases (NFADD,NFPU), firm purchase capitalization (FPTBF) and other required financing (MISCGA,MISCFN).

FNRQ (YEAR)**: Financing Required** (M$)

The utility must finance total construction work in progress (TCW), debt repayments (DBRP), capacity capital additions (GCAD), preferred stock sinking funds (PSSF), nuclear fuel purchases (NFADD,NFPU), firm purchase capitalization (FPTBF) and other required financing (MISCGA,MISCFN).

FOMRB : Fraction of O&M Costs in Rate Base

An exogenously specified input reflecting the carry cost of operations and maintenance expenses. It is used in the calculation of working capital.

FOMRB : Fraction of O&M Costs in Rate Base

An exogenously specified input reflecting the carry cost of operations and maintenance expenses. It is used in the calculation of working capital.

FP (PRICES,YEAR)**: Delivered Fuel Price** $/GJ

FP (PRICES,YEAR)**: Fuel Prices** ($/mBtu or $/GJ)

Fuel prices are calculated in the supply sector as the sum of primary national fuel prices, delivery charges and all taxes. They form the base for the calculation of local prices(ECFP) in the TPRICE procedure in the demand sector. FP0 is the first year price.

FP (PRICES,YEAR)**: Fuel Prices** ($/mBtu or $/GJ)

Fuel prices are calculated in the supply sector as the sum of primary national fuel prices, delivery charges and all taxes. They form the base for the calculation of local prices(ECFP) in the TPRICE procedure in the demand sector. FP0 is the first year price.

FP (PRICES,YEAR)**: Delivered Fuel Price** $/GJ

FP0 (PRICES,FIRST)**: Fuel Prices** ($/mBtu or $/GJ)

Fuel prices are calculated in the supply sector as the sum of primary national fuel prices, delivery charges and all taxes. They form the base for the calculation of local prices(ECFP) in the TPRICE procedure in the demand sector. FP0 is the first year price.

FP0 (PRICES,FIRST)**: Fuel Prices** ($/mBtu or $/GJ)

Fuel prices are calculated in the supply sector as the sum of primary national fuel prices, delivery charges and all taxes. They form the base for the calculation of local prices(ECFP) in the TPRICE procedure in the demand sector. FP0 is the first year price.

FPDCHG (PRICES,YEAR)**: Fuel Delivery charge** $/GJ

FPDCHG (PRICES,YEAR)**: Fuel Delivery charge** $/GJ

FPDP (HORIZON,YEAR)**: Future Peak Demand for Power** (MW)

There are four extrapolation methods used to derive FPDP. Most use the smoothing functions and one or smoothing constants to grow demand in the future. FPDP may also be exogenously specified.

FPDP (HORIZON,YEAR)**: Future Peak Demand for Power** (MW)

There are four extrapolation methods used to derive FPDP. Most use the smoothing functions and one or smoothing constants to grow demand in the future. FPDP may also be exogenously specified.

FPEG : Total Firm Purchase Electric Generation

Total firm purchase electric generation is the sum over season of the firm purchases by season.

FPEG : Total Firm Purchase Electric Generation

Total firm purchase electric generation is the sum over season of the firm purchases by season.

FPSM (PRICES,YEAR)**: Energy Sales Tax** $/GJ

FPSM (PRICES,YEAR)**: Energy Sales Tax** $/GJ

FPTAX (PRICES,YEAR)**: Fuel Tax** $/GJ

FPTAX (PRICES,YEAR)**: Fuel Tax** $/GJ

FSDMD (TECH,EC,YEAR)**: Feedstock Energy Demand** (tBtu/YR OR GJ/YR)

FSDMD is calculated in the procedure End Use Demand(EUDEMAND) in the demand files. It is defined as the ratio of total productive capacity divided by the feedstock process efficiency and can be further modified by a capacity utilization factor.

FSDMD (TECH,EC,YEAR)**: Feedstock Energy Demand** (tBtu/YR OR GJ/YR)

FSDMD is calculated in the procedure End Use Demand(EUDEMAND) in the demand files. It is defined as the ratio of total productive capacity divided by the feedstock process efficiency and can be further modiifed by a capacity utilization factor.

FSPEE (TECH,EC,YEAR)**: Feedstock Process Efficiency** ($/mBtu or $/GJ)

FSPEE is a calibrated variable used in the calculation of Feedstock Energy Demand(FSDMD) in the End Use Demand procedure in the demand files. It is derived in the ICALIB file by the relationship of the model generated production capacity(modified by a utilization factor) to historical feedstock demands.

FSPEE (TECH,EC,YEAR)**: Feedstock Process Efficiency** ($/mBtu or $/GJ)

FSPEE is a calibrated variable used in the calculation of Feedstock Energy Demand(FSDMD) in the End Use Demand procedure in the demand files. It is derived in the ICALIB file by the relationship of the model generated production capacity(modified by a utilization factor) to historical feedstock demands.

FT (HORIZON)**: Forecast Time** YEARS

The number of years in the forecast period. Used to calculate the load forecast.

FT (HORIZON)**: Forecast Time** YEARS

The number of years in the forecast period. Used to calculate the load forecast.

FUTYR : Year for Capacity Planning Horizon YEAR

This is the final year of the forecast period and is defined as the current year plus the forecasting time, but not past the last year of model calculations.

FUTYR : Year for Capacity Planning Horizon YEAR

This is the final year of the forecast period and is defined as the current year plus the forecasting time, but not past the last year of model calculations.

FVF (ENDUSE,TECH,CTECH,EC,YEAR)**: Fungible Market Share Variance Factor** ($/$)

A calibrated variable used in the calculation of fungible market share allocation weights which are then used to calculate the fungible market shares. Picks up the "suboptimality" of consumer choice - incorporates the idea that not all consumers have access to perfect information or meet all the other criteria necessary to choose the economically optimal outcome.

FVF (ENDUSE,TECH,CTECH,EC,YEAR)**: Fungible Market Share Variance Factor** ($/$)

A calibrated variable used in the calculation of fungible market share allocation weights which are then used to calculate the fungible market shares. Picks up the "suboptimality" of consumer choice - incorporates the idea that not all consumers have access to perfect information or meet all the other criteria necessary to choose the economically optimal outcome.

FXRV : Revenues from Fixed Costs

The fixed cost component of allowed revenue, it is the residual after fuel costs, purchase power costs and differential charges are subtracted from AREV. Responsibility for FXRV is allocated on the basis of contribution to peak demand. FXRV is calculated in the price procedure in the electric sector and is used in the determination of prices by class.

FXRV : Revenues from Fixed Costs ($M)

The fixed cost component of allowed revenue, it is the residual after fuel costs, purchase power costs and differential charges are subtracted from AREV. Responsibility for FXRV is allocated on the basis of contribution to peak demand. FXRV is calculated in the price procedure in the electric sector and is used in the determination of prices by class.

GA (AA,YEAR)**: Gross Assets** (M$)

Gross Assets by assets are GALV summed across the age dimension.

GA (AA,YEAR)**: Gross Assets** (M$)

Gross Assets by assets are GALV summed across the age dimension.

GAA (AA,YEAR)**: Additions to Gross Assets** (M$)

The additions to gross assets are set equal to the construction work into gross assets plus AFUDC into gross assets.

GAA (AA,YEAR)**: Additions to Gross Assets** (M$)

The additions to gross assets are set equal to the construction work into gross assets plus AFUDC into gross assets.

GALV (AA,AGE,YEAR)**: Gross Assets** (M$)

This variable hold the values of gross assets by age. The gross assets in the OLD age class are equal to the previous period's values less retirements plus thr gross assets in the middle clase that were shifted to the old class. The gross assets in the middle age class are equal to the previous period's values less theassets shifted from the middle to the old class plus the assets shifted from NEW to middle (MID). The gross assets in the NEW class are equal to the previous period's value less the assets shifted from NEW to middle (MID) plus the additions to gross assets.

GALV (AA,AGE,YEAR)**: Gross Assets** (M$)

This variable hold the values of gross assets by age. The gross assets in the OLD age class are equal to the previous period's values less retirements plus the gross assets in the middle class that were shifted to the old class. The gross assets in the middle age class are equal to the previous period's values less the assets shifted from the middle to the old class plus the assets shifted from NEW to middle (MID). The gross assets in the NEW class are equal to the previous period's value less the assets shifted from NEW to middle (MID) plus the additions to gross assets.

GALVI (AA,AGE)**: Initial Level of Gross Assets** (M$)

GALVI is the initial Gross Assets split in EDATA into age groups. The split between three age groups (0.65,0.25,0.10) is based on the historical growth in electric utility assets.

GALVI (AA,AGE)**: Initial Level of Gross Assets** (M$)

GALVI is the initial Gross Assets split in EDATA into age groups. The split between three age groups (0.65,0.25,0.10) is based on the historical growth in electric utility assets.

GAPL (AA)**: Gross Assets Physical Life** (YRS)

An exogenously specified input variable used in the calculation of retirement of gross assets from construction costs.

GAPL (AA)**: Gross Assets Physical Life** (YRS)

An exogenously specified input variable used in the calculation of retirement of gross assets from construction costs.

GC (PLANT,YEAR)**: Generation Capacity** (MW)

Generation capacity is calculated as the integral of capacity completions (GCCR) less retirements (GCR)

GC (PLANT,YEAR)**: Generation Capacity** (MW)

Generation capacity is calculated as the integral of capacity completions (GCCR) less retirements (GCR)

GCAC (PLANT,YEAR)**: Cost of Capital Additions**

Unit capital additions are usually expressed in terms of a percentage of total plant capital costs (GCAC). This percentage may change over time as it has with nuclear and coal plants. The change rate used to calculate GCAC is exogenously specified.

GCAC (PLANT,YEAR)**: Cost of Capital Additions**

Unit capital additions are usually expressed in terms of a percentage of total plant capital costs (GCAC). This percentage may change over time as it has with nuclear and coal plants. The change rate used to calculate GCAC is exogenously specified.

GCACGR (PLANT)**: Plant Cap. Additions Growth Rate**

Plant Capital Additions Growth Rate is the the change rate on unit capital additions. It is exogenously specified and can change over time.

GCACGR (PLANT)**: Plant Cap. Additions Growth Rate**

Plant Capital Additions Growth Rate is the change rate on unit capital additions. It is exogenously specified and can change over time.

GCACI (PLANT)**: Initial Cost of Capital Additions**

This is the initial exogenously specified value of the Unit Cost of Capital Additions (GCAC)

GCACI (PLANT)**: Initial Cost of Capital Additions**

This is the initial exogenously specified value of the Unit Cost of Capital Additions (GCAC)

GCAD (PLANT,YEAR)**: Plant Capital Additions** (M$)

Power plants often require capital additions (GCAD) as new technology or legislation dictages. Total capital additions in $M by plant type are equal to the total capacity (MW) multipled by the unit capital cost and total plant capital costs($/kW).

GCAD (PLANT,YEAR)**: Plant Capital Additions** (M$)

Power plants often require capital additions (GCAD) as new technology or legislation dictates. Total capital additions in $M by plant type are equal to the total capacity (MW) multiplied by the unit capital cost and total plant capital costs($/kW).

GCCC (PLANT,YEAR)**:** **Generation Capacity Capital Costs** ($/KW)

This user specified input variable is equal to the unit direct capital cost in current dollars per kW. It is used in the calculation of construction work in progress.

GCCC (PLANT,YEAR)**:** **Generation Capacity Capital Costs** ($/KW)

This user specified input variable is equal to the unit direct capital cost in current dollars per Kw. It is used in the calculation of construction work in progress.

GCCCM (PLANT,YEAR)**:** **Capital Cost Multiplier** ($/$)

A capital cost multiplier is available to change capital cost rates in the future as an uncertainty test.

GCCCM (PLANT,YEAR)**:** **Capital Cost Multiplier** ($/$)

A capital cost multiplier is available to change capital cost rates in the future as an uncertainty test.

GCCCN (PLANT,YEAR)**:** **Generation Capacity Capital Costs** ($/KW)

A calibrated variable used in the calculation of generation capital cost (GCCC).

GCCCN (PLANT,YEAR)**:** **Generation Capacity Capital Costs** ($/KW)

A calibrated variable used in the calculation of generation capital cost (GCCC).

GCCI (PLANT,YEAR)**:** **Generation Capacity Initial Rate** (MW/YR)

An exogenously specified input used to initialize the model

GCCI (PLANT,YEAR)**:** **Generation Capacity Initial Rate** (MW/YR)

An exogenously specified imput used to initialize the model

GCCIA (PJ,YEAR)**:** **Cumulative Megawatts Developed** (MW)

This variable is the sum of existing megawatts plus new capacity developed. It is used to calculate the cumulative expansion plan market share.

GCCIA (PJ,YEAR)**:** **Cumulative Megawatts Developed** (MW)

This variable is the sum of existing megawatts plus new capacity developed. It is used to calculate the cumulative expansion plan market share.

GCCIAC (PJ)**: Current Cumulative MW Developed** (MW)

This variable is the sum of the capacity awarded by type and is used in the determination of GCCIA - cumulative MW.

GCCIAC (PJ)**: Current Cumulative MW Developed** (MW)

This variable is the sum of the capacity awarded by type and is used in the determination of GCCIA - cumulative MW.

GCCIAR (PJ,YEAR)**: Cumulative Expansion Plan Market Share**

The cumulative expansion plan market share is the percentage of each new plant type being constructed. It is used in the plant initiation procedure.

GCCIAR (PJ,YEAR)**: Cumulative Expansion Plan Market Share**

The cumulative expansion plan market share is the percentage of each new plant type being constructed. It is used in the plant initiation procedure.

GCCISW : Switch to Endogenously Build Plants

GCCOST (PLANT,YEAR)**: Generating Capacity Capital Cost** ($/KW)

The generating capacity capital cost per KW by plant type is a function of the construction work into gross assets, AFUDC into gross assets, and the amount of capaicty completed.

GCCOST (PLANT,YEAR)**: Generating Capacity Capital Cost** ($/KW)

The generating capacity capital cost per kW by plant type is a function of the construction work into gross assets, AFUDC into gross assets, and the amount of capacity completed.

GCCR (PLANT,YEAR)**: Gen. Capacity Completion Rate** (MW/YR)

At the end of each year CUC is shifted to the next year. If any plants are completed, CUC is added to the generation capacity completion rate - in other words become part of a utility's generation capacity.

GCCR (PLANT,YEAR)**: Gen. Capacity Completion Rate** (MW/YR)

At the end of each year CUC is shifted to the next year. If any plants are completed, CUC is added to the generation capacity completion rate - in other words become part of a utility's generation capacity.

GCCV : Generation Capacity Converted from Oil to Coal MW

An exogenously specified input variable used in the calculation of generation capacity complete rate for coal that includes both new plants and conversions.

GCCV : Generation Capacity Converted from Oil to Coal (MW)

An exogenously specified input variable used in the calculation of generation capacity complete rate for coal that includes both new plants and conversions.

GCCVCST : Generation Capacity Oil to Coal Conversion Costs $/kW

The cost of converting oil plants to coal is an exogenous input to the model.

GCCVCST : Generation Capacity Oil to Coal Conversion Costs $/kW

The cost of converting oil plants to coal is an exogenous input to the model.

GCDMS (PJ,YEAR)**: Desired Expansion Plan Market Share**

An exogenously specified policy variable used to control the types of generating capacity constructed in the future.

GCDMS (PJ,YEAR)**: Desired Expansion Plan Market Share**

An exogenously specified policy variable used to control the types of generating capacity constructed in the future.

GCEXCST (YEAR)**: Life Extension Costs** (M$)

Life extension costs are included in generating plant construction expenditure (TCW) if any are undertaken. It is an exogenously specified variable.

GCEXCST (YEAR)**: Life Extension Costs** (M$)

Life extension costs are included in generating plant construction expenditure (TCW) if any are undertaken. It is an exogenously specified variable.

GCFCST (PLANT,YEAR)**: Fuel Conversion Cost** (M$)

An exogenously specified input (and policy) variable used in the calculation of total construction work (TCW).

GCFCST (PLANT,YEAR)**: Fuel Conversion Cost** (M$)

An exogenously specified input (and policy) variable used in the calculation of total construction work (TCW).

GCFCV (PLANT,YEAR)**: Fuel Conversion** (MW)

A variable used in calculating total generating capacity by plant type (GC), GCFCV is an exogenously specified variable.

GCFCV (PLANT,YEAR)**: Fuel Conversion** (MW)

A variable used in calculating total generating capacity by plant type (GC), GCFCV is an exogenously specified variable.

GCFR (PLANT,YEAR)**: Fraction of New Capacity by Plant Type** (Frac)

This is an exogenously specified input variable used in the calculation for avoided cost of energy (ACE).

GCFR (PLANT,YEAR)**: Fraction of New Capacity by Plant Type** (Frac)

This is an exogenously specified input variable used in the calculation for avoided cost of energy (ACE).

GCFRAC (PLANT)**: Distribution of Capacity Under Construction** fraction

This is the current market share fraction for each plant type under construction. It is calculated from the capacity under construction.

GCFRAC (PLANT)**: Distribution of Capacity Under Construction** fraction

This is the current market share fraction for each plant type under construction. It is calculated from the capacity under construction.

GCL (PLANT,YEAR)**: Generation Capacity** (MW)

GCPCST (PLANT,YEAR)**: Pollution Conversion Costs** M$

GCPL (PLANT)**: Generation Capacity Physical Life** (YRS)

An exogenously specified input used in the calculation of plant retirements.

GCPL (PLANT)**: Generation Capacity Physical Life** (YRS)

An exogenously specified input used in the calculation of plant retirements.

GCR (PLANT,YEAR)**: Generation Cap. Retirements** (MW/YR)

Plants retirements by type are exogenously specified in MW/year. They are calculated in EDATA as last year's generating capacity minus this year's generating capacity plus generating capacity completed during the current year plus any fuel conversions. Also included are net deratings - the sum of deratings and upratings. Plant retirements are used in the calculation of total generation capacity.

GCR (PLANT,YEAR)**: Generation Cap. Retirements** (MW/YR)

Plants retirements by type are exogenously specified in MW/year. They are calculated in EDATA as last year's generating capacity minus this year's generating capacity plus generating capacity completed during the current year plus any fuel conversions. Also included are net deratings - the sum of deratings and upratings. Plant retirements are used in the calculation of total generation capacity.

GECONV : Gas Energy Conversion (THERM/mBtu or THERM/GJ)

Standard engineering values from national data. Converts mBtu to therms throughout the model.

GECONV : Gas Energy Conversion (THERM/mBtu or THERM/GJ)

Standard engineering values from national data. Converts mBtu to therms throughout the model.

GPGC (POWER,YEAR)**: Gross New Capacity Requirements** (MW)

The estimate of gross new capacity requirements is equal to the forecasted capacity requirements minus the forecasted capacity available.

GPGC (POWER,YEAR)**: Gross New Capacity Requirements** (MW)

The estimate of gross new capacity requirements is equal to the forecasted capacity requirements minus the forecasted capacity available.

GSALES (ENDUSE,EC,YEAR)**: Gas Sales** (MTHERM/YR)

Calculated in the Daily Use Procedure in the demand sector; GSALES is the product of the EUDUC(average daily use curve) time hours in each season, summed over all seasons.

GSALES (ENDUSE,EC,YEAR)**: Gas Sales** (MTHERM/YR)

Calculated in the Daily Use Procedure in the demand sector; GSALES is the product of the EUDUC(average daily use curve) time hours in each season, summed over all seasons.

GSEXP (YEAR)**: Gas Purchased for Resale** (M$)

An exogenously specified input used, if applicable, in the calculation of operating expenses and taxable income.

GSEXP (YEAR)**: Gas Purchased for Resale** (M$)

An exogenously specified input used, if applicable, in the calculation of operating expenses and taxible income.

GSREV (YEAR)**: Gas Revenues** (M$)

Gas revenues are determined historically as the difference between historical revenues (XREV) and the sum of revenues by rate class (XRTRV). Future years are set equal to the last historical year.

GSREV (YEAR)**: Gas Revenues** (M$)

Gas revenues are determined historically as the difference between historical revenues (XREV) and the sum of revenues by rate class (XRTRV). Future years are set equal to the last historical year.

HAT (HORIZON)**: Historical Averaging Time** (YRS)

An exogenously specified input used in the calculation of smoothed future demand.

HAT (HORIZON)**: Historical Averaging Time** (YRS)

An exogenously specified input used in the calculation of smoothed future demand.

HOURS (SEASON)**: Hours per Season**

Hours in each season. Found in SDATA.

HOURS (MONTH)**: Hours per Month**

An exogenously specified parameter used in the calculation of average demand for power. Monthly sendout is divided by hours in the month.

HOURS (MONTH)**: Hours per Month**

An exogenously specified parameter used in the calculation of average demand for power. Monthly sendout is divided by hours in the month.

HOURS (SEASON)**: Hours per Season**

Hours in each season. Found in SDATA.

HPEE (TECH,EC,YEAR)**: Process Efficiency** ($/Btu or $/J)

This is the process efficiency for residential and commercial space heating. See the entry for PEE.

HPEE (TECH,EC,YEAR)**: Process Efficiency** ($/Btu or $/J)

This is the process efficiency for residential and commercial space heating. See the entry for PEE.

HPER (TECH,EC,YEAR)**: Process Energy Requirement** (mBtu/YR or GJ/YR)

This is the process energy requirement for residential and commercial space heating. See the entry for PER

HPER (TECH,EC,YEAR)**: Process Energy Requirement** (mBtu/YR or GJ/YR)

This is the process energy requirement for residential and commercial space heating. See the entry for PER

HPKM (SEASON,YEAR)**: Hourly Peak Day Multiplier**

HPKM is a user-specified variable used to modify the load duration curves in the demand sector. A value of HPKM different from one is selected if the fraction of temperature sensitive load is expected to change in the future from its historic value.

HPKM (SEASON,YEAR)**: Hourly Peak Day Multiplier**

HPKM is a user-specified variable used to modify the load duration curves in the demand sector. A value of HPKM different from one is selected if the fraction of temperature sensitive load is expected to change in the future from its historic value.

HRTA (PLANT,YEAR)**: Average Heat Rate** (Btu/kWh)

The average heat rate is calculated for each plant type as the ratio of embodied fuel requirements (the energy needed if the plants were at full operation) and the on-line capacity.

HRTA (PLANT,YEAR)**: Average Heat Rate** (Btu/kWh)

The average heat rate is calculated for each plant type as the ratio of embodied fuel requirements (the energy needed if the plants were at full operation) and the online capacity.

HRTM (PLANT,YEAR)**: Marginal Heat Rate** (Btu/kWh)

Marginal heat rates are exogenously specified by plant and are used in the calculation of average heat rates and embodied fuel requirements.

HRTM (PLANT,YEAR)**: Marginal Heat Rate** (Btu/kWh)

Marginal heat rates are exogenously specified by plant and are used in the calculation of average heat rates and embodied fuel requirements.

IBM (ENDUSE,TECH,EC,YEAR)**: Indicated-Engineering Budget Multiplier** ($/$)

The IBM is an user-specified variable used in the determination of the marginal value of device usage(MVDU) which is used to in the fuel market share calculations. IBM can be adjusted to modify the ratio of fuel price to average efficiency if the effect of this ratio on fuel market share calculations is expected to deviate from history in the future.

IBM (ENDUSE,TECH,EC,YEAR)**: Indicated-Engineering Budget Multiplier** ($/$)

The IBM is an user-specified variable used in the determination of the marginal value of device usage(MVDU) which is used to in the fuel market share calculations. IBM can be adjusted to modify the ratio of fuel price to average efficiency if the effect of this ratio on fuel market share calculations is expected to deviate from history in the future.

IC (ENDUSE,TECH,YEAR)**: Indirect Costs** ($/mBtu or $/GJ)

Values not currently used in model.

IC (ENDUSE,TECH,YEAR)**: Indirect Costs** ($/mBtu or $/GJ)

Values not currently used in model.

ID (YEAR)**: Intermediate Debt** (M$)

Intermediate debt is net intermediate indebtedness (funds acquired by going into debt minus and extra payments and any debt repaid) integrated over time

ID (YEAR)**: Intermediate Debt** (M$)

Intermediate debt is net intermediate indebtedness (funds acquired by going into debt minus and extra payments and any debt repaid) integrated over time

IDAL (YEAR)**: Intermediate Debt Average Lifetime** (YRS)

An exogenously specified input variable used in the calculation of intermediate debt repaid.

IDAL (YEAR)**: Intermediate Debt Average Lifetime** (YRS)

An exogenously specified input variable used in the calculation of intermediate debt repaid.

IDEL (YEAR)**: Interchanged Power Delivered** (gWh)

An exogenously specified variable that, along with IREC, is used to net out interchange power used in the calculation of the smoothed average demand for power.

IDEL (YEAR)**: Interchanged Power Delivered** (GWH)

An exogenously specified variable that, along with IREC, is used to net out interchange power used in the calculation of the smoothed average demand for power.

IDFD (YEAR)**: Funds from Intermediate Debt** (M$/YR)

An intermediate-term loan may be obtained as part of new debt financing up to the limit on new intermediate-term debt.

IDFD (YEAR)**: Funds from Intermediate Debt** (M$/YR)

An intermediate-term loan may be obtained as part of new debt financing up to the limit on new intermediate-term debt.

IDIN (YEAR)**: Interest on Intermediate Debt** (M$/YR)

The interest on intermediate debt is the yearly debt service required for intermediate debt. It is calculated by multiplying the total intermediate debt times the intermediate debt interest rate.

IDIN (YEAR)**: Interest on Intermediate Debt** (M$/YR)

The interest on intermediate debt is the yearly debt service required for intermediate debt. It is calculated by multiplying the total intermediate debt times the intermediate debt interest rate.

IDIR (YEAR)**: Interest Rate on Intermediate Debt** (1/YR)

The interest rate on intermediate debt is calculated as the real rate of return required plus inflation.

IDIR (YEAR)**: Interest Rate on Intermediate Debt** (1/YR)

The interest rate on intermediate debt is calculated as the real rate of return required plus inflation.

IDLM (YEAR)**: Debt Max. Frac. of Total Capitalization**

This limit on intermediate debt is exogenous but is ususally set to zero in the base version of the model.

IDLM (YEAR)**: Debt Max. Frac. of Total Capitalization**

This limit on intermediate debt is exogenous but is usually set to zero in the base version of the model.

IDNLM : Limit on New Intermediate Debt M$

IDPR (YEAR)**: Intermediate Debt Risk Premium** (1/YR)

An exogenously specified real rate of return on intermediate debt used to calculate intermediate debt service.

IDPR (YEAR)**: Intermediate Debt Risk Premium** (1/YR)

An exogenously specified real rate of return on intermediate debt used to calculate intermediate debt service.

IDRP (YEAR)**: Intermediate Debt Repayments** (M$/YR)

Intermediate debt repaid is equal to the total intermediate debt divided by the debt lifetime.

IDRP (YEAR)**: Intermediate Debt Repayments** (M$/YR)

Intermediate debt repaid is equal to the total intermediate debt divided by the debt lifetime.

IDUC (YEAR)**: Interchanged Power Delivered Unit Cost** (MILLS/kWh)

This cost is exogenously specified and is used in the calculation of Purchased Power Unit Costs (PUCT).

IDUC (YEAR)**: Interchanged Power Delivered Unit Cost** (MILLS/kWh)

This cost is exogenously specified and is used in the calculation of Purchased Power Unit Costs (PUCT).

ILEG (YEAR)**: Interruptible Load Gen.** (MW)

Total interruptible load generation for the year is the sum of the interruptible load generation by season.

ILEG (YEAR)**: Interruptible Load Gen.** (MW)

Total interruptible load generation for the year is the sum of the interruptible load generation by season.

ILGC (MONTH,YEAR)**: Interruptible Load Effective Gen. Cap.** (MW)

Interruptible load is considered generating capacity on peak and is exogenously specified. It is often used as a policy variable.

ILGC (MONTH,YEAR)**: Interruptible Load Effective Gen. Cap.** (MW)

Interruptible load is considered generating capacity on peak and is exogenously specified. It is often used as a policy variable.

INC (SECTOR,FUEL,YEAR)**: Incentives** (M$/YR)

INC is the program level incentive to the participant and is calculated in the DSM post processing routine in the demand sectors as the sum of the dollar value of rebates and low interest loans(net present value of capitalized conservation).

INC (SECTOR,FUEL,YEAR)**: Incentives** (M$/YR)

INC is the program level incentive to the participant and is calculated in the DSM post processing routine in the demand sectors as the sum of the dollar value of rebates and low interest loans(net present value of capitalized conservation).

INCAC (YEAR)**: Income after CS Dividend Payments** (M$/YR)

Income before common stock dividends is reduced by CSDV and becomes income available to common stockholders after common stock dividends are paid out. It is added to retained earnings.

INCAC (YEAR)**: Income after CS Dividend Payments** (M$/YR)

Income before common stock dividends is reduced by CSDV and becomes income available to common stockholders after common stock dividends are paid out. It is added to retained earnings.

INCBC (YEAR)**: Income before CS Dividend Payments** (M$/YR)

Preferred stock dividents are paid from net income to produce income before CS dividend payments.

INCBC (YEAR)**: Income before CS Dividend Payments** (M$/YR)

Preferred stock dividends are paid from net income to produce income before CS dividend payments.

INCBI (YEAR)**:** **Income before Interest** (M$/YR)

Income before common dividends and interest payments equals operating income from all operations plus reported income from AFC on equity plus other income less income taxes on other income.

INCBI (YEAR)**:** **Income before Interest** (M$/YR)

Income before common dividends and interest payments equals operating income from all operations plus reported income from AFC on equity plus other income less income taxes on other income.

INFLA (YEAR)**:** **Inflation Index** ($/$)

The inflation index is used to convert real to nominal values in the model. It is calculated by integration from INFLR, a REMI output. The calculations are performed in the meconomy sector.

INFLA (YEAR)**:** **Inflation Index** DLESS

INFLA (YEAR)**:** **Inflation Index** DLESS

The inlation index is calculated from the inflation rate (INFLR).

INFLA (YEAR)**:** **Inflation Index** ($/$)

The inflation index is used to convert real to nominal values in the model. It is calculated by integration from INFLR, a REMI output. The calculations are performed in the meconomy sector.

INFLA0 (FIRST)**:** **Inflation Index** ($/$)

The inflation index is used to convert real to nominal values in the model. It is calculated by integration from INFLR, a REMI output. The calculations are performed in the meconomy sector.

INFLA0 (FIRST)**:** **Inflation Index** ($/$)

The inflation index is used to convert real to nominal values in the model. It is calculated by integration from INFLR, a REMI output. The calculations are performed in the meconomy sector.

INFLR (YEAR)**: Inflation Rate** 1/YEAR

The future inflation rate comes from an exogenous forecast or from the REMI model.

INFLR (YEAR)**: Inflation Rate** 1/YEAR

INFLR (YEAR)**: Inflation Rate** ($/$)

Inflation rates are generally provided from the REMI model, however, they can be entered exogenously in the mdata file. INFLR is used to produce an inflation index, INFLA, by integration. It is also used to produce a "smoothed" value of inflation(INSM). Both calculations are in the meconomy sector.

INFLR (YEAR)**: Inflation Rate** ($/$)

Inflation rates are generally provided from the REMI model, however, they can be entered exogenously in the mdata file. INFLR is used to produce an inflation index, INFLA, by integration. It is also used to produce a "smoothed" value of inflation(INSM). Both calculations are in the meconomy sector.

INSM (YEAR)**: Smoothed Inflation Rate** (($/YR)/$)

A "smoothed" value of inflation(INSM) is calculated in the meconomy sector from the REMI output INFLR and an inflation smoothing time(INST) to reflect the impact of inflation on the money markets.

INSM (YEAR)**: Smoothed Inflation Rate** 1/YEAR

The smoothed inflation rate is calculated from the inflation rate (INFLR) as a moving five year average.

INSM (YEAR)**: Smoothed Inflation Rate** 1/YEAR

INSM (YEAR)**: Smoothed Inflation Rate** (($/YR)/$)

A "smoothed" value of inflation(INSM) is calculated in the meconomy sector from the REMI output INFLR and an inflation smoothing time(INST) to reflect the impact of inflation on the money markets.

IOTHER (YEAR)**: Income from Other Sources** (M$/YR)

Other income is a calibrated variable used in the calculation of OTINC.

IOTHER (YEAR)**: Income from Other Sources** (M$/YR)

Other income is a calibrated variable used in the calculation of OTINC.

IPGC (POWER,YEAR)**: Indicated Planned Generation Cap.** (MW)

Incremental capacity requirements are determined by subtracting retirements, plants under construction, regional interchange contracts, firm purchases, interruptable load and qualified facility capacity from current capacity. IPGC is calculated separately for baseload capacity and peak capacity.

IPGC (POWER,YEAR)**: Indicated Planned Generation Cap.** (MW)

Incremental capacity requirements are determined by subtracting retirements, plants under construction, regional interchange contracts, firm purchases, interruptible load and qualified facility capacity from current capacity. IPGC is calculated separately for baseload capacity and peak capacity.

IREC (YEAR)**: Interchanged Power Received** (gWh)

An exogenously specified variable that, along with IDEL, is used to net out interchange power used in the calculation of the smoothed average demand for power.

IREC (YEAR)**: Interchanged Power Received** (GWH)

An exogenously specified variable that, along with IDEL, is used to net out interchange power used in the calculation of the smoothed average demand for power.

IRUC (YEAR)**: Interchanged Power Received Unit Cost** (MILLS/kWh)

This cost is exogenously specified and is included in the calculation of purchased power costs (PUCT).

IRUC (YEAR)**: Interchanged Power Received Unit Cost** (MILLS/kWh)

This cost is exogenously specified and is included in the calculation of purchased power costs (PUCT).

ITX (YEAR)**: Income Tax** (M$/YR)

Actual income tax payments are taxes before credits less claimed investment tax credits.

ITX (YEAR)**: Income Tax** (M$/YR)

Actual income tax payments are taxes before credits less claimed investment tax credits.

ITXBC (YEAR)**: Income Tax before Credits** (M$/YR)

The income tax before credits is taxible income multiplied by the tax rate.

ITXBC (YEAR)**: Income Tax before Credits** (M$/YR)

The income tax before credits is taxable income multiplied by the tax rate.

ITXRP (YEAR)**: Income Tax Reported** (M$/YR)

The income taxes reported are then the actual taxes paid (ITX) plus deferred tax credits less amortized credits plus net deferred taxes plus AFC tax effects less taxes on other income.

ITXRP (YEAR)**: Income Tax Reported** (M$/YR)

The income taxes reported are then the actual taxes paid (ITX) plus deferred tax credits less amortized credits plus net deferred taxes plus AFC tax effects less taxes on other income.

JDA (CENDUSE,TECH)**: Joint Device Adjustment**

JDA is used in determining the weighted system marginal cost of fuel use. If the JDA equals zero, then the system marginal cost of fuel use is the sum of the marginal costs of fuel use by type. If the JDA equals one, then the system marginal cost of fuel use reflects energy use synergies that can occur during the simultaneous use of different energy devices.

JDA (CENDUSE,TECH)**: Joint Device Adjustment**

JDA is used in determining the weighted system marginal cost of fuel use. If the JDA equals zero, then the system marginal cost of fuel use is the sum of the marginal costs of fuel use by type. If the JDA equals one, then the system marginal cost of fuel use reflects energy use synergies that can occur during the simultaneous use of different energy devices.

LF (YEAR)**: Load Factor** (MW/MW)

The load factor is calculated by dividing the average load (ADP) by the peak load (PDP).

LF (YEAR)**: Load Factor** (MW/MW)

The load factor is calculated by dividing the average load (ADP) by the peak load (PDP).

LI (ENDUSE,TECH,EC)**: Loss Intensity** (Btu/Btu OR J/J)

This intermediate, calculated variable is used in the process of calculating Inter-End-Use Cross Impacts in the demand sector specifically captures the waste heat from inefficiencies. It is computed as a function of the device and process efficiencies, a calibrated loss intensity factor and is modified by other variables.

LI (ENDUSE,TECH,EC)**: Loss Intensity** (Btu/Btu OR J/J)

This intermediate, calculated variable is used in the process of calculating Inter-End-Use Cross Impacts in the demand sector specifically captures the waste heat from inefficiencies. It is computed as a function of the device and process efficiencies, a calibrated loss intensity factor and is modified by other variables.

LIMIT (DISPATCH,MONTH)**: Upper Limit for Dispatch** (MW)

Baseload, peaking and nuclear plant dispatch is limited with this variable. Baseload plants are limited to MILP; nuclear plants are limited by minimum load constraints (NUMLCFR) and peaking and intermediate plants are limited only by the system peak (PDPM).

LIMIT (DISPATCH,MONTH)**: Upper Limit for Dispatch** MW

Baseload, peaking and nuclear plant dispatch is limited with this variable. Baseload plants are limited to MILP; nuclear plants are limited by minimum load constraints (NUMLCFR) and peaking and intermediate plants are limited only by the system peak (PDPM).

LIN (ENDUSE,TECH,EC)**: Loss Intensity - Normal** (Btu/Btu OR J/J)

This calibrated variable is used specifically as a component of the loss intensity equation(LI) found in the cross-impact procedure of the demand sector that captures the waste heat from inefficiencies.

LIN (ENDUSE,TECH,EC)**: Loss Intensity - Normal** (Btu/Btu OR J/J)

This calibrated variable is used specifically as a component of the loss intensity equation(LI) found in the cross-impact procedure of the demand sector that captures the waste heat from inefficiencies.

LMCAP (ENDUSE,YEAR)**: Load Management Capitalized** (M$)

Load Management Capitalized(LMCAP) can be either endogenously or exogenously determined. If it is exogenously determined it is equal to XLMCAP. If endogenous, it is a function of the market share, response time, load shape fraction and energy demand and can include an exogenous component as well

LMCAP (ENDUSE,YEAR)**: Load Management Capitalized** (M$)

Load Management Capitalized(LMCAP) can be either endogenously or exogenously determined. If it is exogenously determined it is equal to XLMCAP. If endogenous, it is a function of the market share, response time, load shape fraction and energy demand and can include an exogenous component as well

LMCAP (SECTOR,YEAR)**: Capitalized Load Management Expenses** (M$/YEAR)

Calculated in the demand sectors and used in the

LMCAP (SECTOR,YEAR)**: Capitalized Load Management Expenses** (M$/YEAR)

Calculated in the demand sectors and used in the

LMDCC (ENDUSE)**: Load Management Capital Cost**

Existing capital cost of load management programs. Data is utility specific and is found in the *data files.

LMDCC (ENDUSE)**: Load Management Capital Cost**

Existing capital cost of load management programs. Data is utility specific and is found in the *data files.

LMDCCP (ENDUSE)**: Load Management Policy Capital Cost**

A policy variable with values determined by the policy to be simulated. Values are found in the *data files.

LMDCCP (ENDUSE)**: Load Management Policy Capital Cost**

A policy variable with values determined by the policy to be simulated. Values are found in the *data files.

LMDCCR : Load Management Capital Charge Rate

The load management capital charge rate is the annualization of load management capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of load management efficiency improvements over the life of the investment. The equation is calculated in the demand sectors and is used to determine the annualized load management capital cost which in turn is used to determine the level of process efficiency selected.

LMDCCR : Load Management Capital Charge Rate

The load management capital charge rate is the annualization of load management capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of load management efficiency improvements over the life of the investment. The equation is calculated in the demand sectors and is used to determine the annualized load management capital cost which in turn is used to determine the level of process efficiency selected.

LMDIVTC : Device Investment Tax Credit (DLESS)

A policy variable, the load management device investment tax credit modifies the load management capital charge rate - reducing the cost of the device under the load management program.

LMDIVTC : Device Investment Tax Credit (DLESS)

A policy variable, the load management device investment tax credit modifies the load management capital charge rate - reducing the cost of the device under the load management program.

LMDRISK : Device Excess Risk (DLESS)

Load Management Device Excess Risk(LMDRISK) comes from national data,(most risk factors in the model are standard DOE risk values) and is found in the *data files. It is used in the calculation of the load management device capital charge rate(LMDCCR) found in the demand sector.

LMDRISK : Device Excess Risk (DLESS)

Load Management Device Excess Risk(LMDRISK) comes from national data,(most risk factors in the model are standard DOE risk values) and is found in the *data files. It is used in the calculation of the load management device capital charge rate(LMDCCR) found in the demand sector.

LMEVF (ENDUSE)**: Load Management Energy Value Fraction**

The load management energy value fraction is an exogenously specified variance factor used in the calculation of load management fuel prices(LMFP).

LMEVF (ENDUSE)**: Load Management Energy Value Fraction**

The load management energy value fraction is an exogenously specified variance factor used in the calculation of load management fuel prices(LMFP).

LMEXP (SECTOR,YEAR)**: Load Management Expenses** (M$/YEAR)

Calculated in the demand sectors and used in the total operation and maintenance cost equation.

LMEXP (ENDUSE,YEAR)**: Load Management Expensed** (M$)

The Load Management Expensed is calculated in the demand sector as a constant fraction of capitalized load management plus any exogenously determined expenses.

LMEXP (SECTOR,YEAR)**: Load Management Expenses** (M$/YEAR)

Calculated in the demand sectors and used in the total operation and maintenance cost equation.

LMEXP (ENDUSE,YEAR)**: Load Management Expensed** (M$)

The Load Management Expensed is calculated in the demand sector as a constant fraction of capitalized load management plus any exogenously determined expenses.

LMFP (ENDUSE)**: Load Management Fuel Price**

The Load Management Fuel Price(LMFP) is a function of annualized capital cost, the cogeneration fuel price and a variance factor. It is calculated in the demand sector and is used to determine the load management indicated market share(LMIMS).

LMFP (ENDUSE)**: Load Management Fuel Price**

The Load Management Fuel Price(LMFP) is a function of annualized capital cost, the cogeneration fuel price and a variance factor. It is calculated in the demand sector and is used to determine the load management indicated market share(LMIMS).

LMIC (ENDUSE)**: Load Management Indirect Cost** (DLESS)

LMIC is an exogenously specified policy adder in the calculation of load management fuel prices(LMFP) in the demand sector.

LMIC (ENDUSE)**: Load Management Indirect Cost** (DLESS)

LMIC is an exogenously specified policy adder in the calculation of load management fuel prices(LMFP) in the demand sector.

LMIMS (ENDUSE)**: Load Management Indicated Market Share**

Load Management Indicated Market Share(LMIMS) is calculated in the demand sector as a function of the ratio of cogeneration and load management fuel prices, the load management market share multiplier and a variance factor. It is used to compute the load management market share(LMMS).

LMIMS (ENDUSE)**: Load Management Indicated Market Share**

Load Management Indicated Market Share(LMIMS) is calculated in the demand sector as a function of the ratio of cogeneration and load management fuel prices, the load management market share multiplier and a variance factor. It is used to compute the load management market share(LMMS).

LMLSFR (ENDUSE,LOAD)**: Load Management Load Shape Reduction**

The indicated shape reduction from the policy being tested is entered in the data files as an input.

LMLSFR (ENDUSE,LOAD)**: Load Management Load Shape Reduction**

The indicated shape reduction from the policy being tested is entered in the data files as an input.

LMMS (ENDUSE,YEAR)**: Load Management Market Share**

LMMS can be calculated either endogenously or exogenously in ENERGY 2020. If an exogenous calculation is desired, then LMMS equals XLMMS. If the calculation is to be endogenous, R

LMMS (ENDUSE,YEAR)**: Load Management Market Share**

LMMS can be calculated either endogenously or exogenously in ENERGY 2020. If an exogenous calculation is desired, then LMMS equals XLMMS. If the calculation is to be endogenous, R

LMMSM (ENDUSE,YEAR)**: Load Management Market Share Multiplier**

The load management market share multiplier is used in the load management procedure in the calculation of the load management indicated market share.

LMMSM (ENDUSE,YEAR)**: Load Management Market Share Multiplier**

The load management market share multiplier is used in the load management procedure in the calculation of the load management indicated market share.

LMOCF : Load Management Operating Cost Factor

The LMOCF is an exogenously specified policy parameter in the data files that is used in the calculation in the demand sector of the amount of Load Management that is expensed.

LMOCF : Load Management Operating Cost Factor

The LMOCF is an exogenously specified policy parameter in the data files that is used in the calculation in the demand sector of the amount of Load Management that is expensed.

LMRT : Load Management Response Time

LMRT is an exogenously specified policy variable used to calculate the Load Management Capitalized(LMCAP) in the demand sector.

LMRT : Load Management Response Time

LMRT is an exogenously specified policy variable used to calculate the Load Management Capitalized(LMCAP) in the demand sector.

LMVF : Load Management Market Share Variance Factor (DLESS)

The load management market share variance factor is used in the load management procedure in the calculation of the load management indicated market share.

LMVF : Load Management Market Share Variance Factor (DLESS)

The load management market share variance factor is used in the load management procedure in the calculation of the load management indicated market share.

LREV (CLASS,YEAR)**: DSM Lost Revenues** ($M)

Lost revenue is computed as the increase in demand savings multiplied by the price of electricity capital costs (PEOC)

LREV (CLASS,YEAR)**: DSM Lost Revenues** $M

Lost revenue is computed as the increase in demand savings multiplied by the price of electricity capital costs (PEOC)

LRSW (YEAR)**: Lost Revenue Switch** 1=ON

LSF (SHAPE,LOAD,SEASON)**: Load Shape Factor** (DLESS)

Derived from historical loadshapes in the calib routines, the Load Shape Factor is used to apportion future demand into economic class load shapes in the loadshape procedure in the demand sector. The load shape factors are estimated, end-use specific ratios that compare the kW contribution to the system seasonal peak and minimum load to the average load. The load shape classifications are peak, average and minimum load for each season - Winter, Spring, Summer, Fall, Late Fall. Each end-use has a set of load shape factors. The LSF average over the year is always 1.0 unless a load management policy is specified. The seasonal "LSF" average may, however, be much different from 1.0.

LSF (SHAPE,LOAD,SEASON)**: Load Shape Factor** (DLESS)

Derived from historical loadshapes in the calib routines, the Load Shape Factor is used to apportion future demand into economic class load shapes in the loadshape procedure in the demand sector. The load shape factors are estimated, end-use specific ratios that compare the kW contribution to the system seasonal peak and minimum load to the average load. The load shape classifications are peak, average and minimum load for each season - Winter, Spring, Summer, Fall, Late Fall. Each end-use has a set of load shape factors. The LSF average over the year is always 1.0 unless a load management policy is specified. The seasonal "LSF" average may, however, be much different from 1.0.

LSMD (LOAD)**: Load Shape Multiplier from Demand Charges**

Values not currently being calculated in model.

LSMD (LOAD)**: Load Shape Multiplier from Demand Charges**

Values not currently being calculated in model.

LSMDE (LOAD)**: Load Shape Multiplier Demand Charge Elasticity**

Values not currently used in model.

LSMDE (LOAD)**: Load Shape Multiplier Demand Charge Elasticity**

Values not currently used in model.

MAF (YEAR)**: Municipal Asset Fraction** (Dless)

The municipal asset fraction divides the utility's total assets into a regulated and municipal components for different regulatory and tax treatments. It is calculated from historical debt and asset values and the municipal debt fraction in EDATA.

MAF (YEAR)**: Municipal Asset Fraction** (Dless)

The municipal asset fraction divides the utility's total assets into a regulated and municipal components for different regulatory and tax treatments. It is calculated from historical debt and asset values and the municipal debt fraction in EDATA.

MCE (PJ,POWER,YEAR)**: Marginal Cost of Energy** ($/KW/YR)

The marginal cost of energy is the perceived cost to the consumer of using each type of energy. It includes the risk, the annualized capital costs, operating costs, delivered marginal fuel costs and any indirect costs associated with using a particular type of energy. It is calculated in

MCE (PJ,POWER,YEAR)**: Marginal Cost of Energy** ($/KW/YR)

The marginal cost of energy is the perceived cost to the consumer of using each type of energy. It includes the risk, the annualized capital costs, operating costs, delivered marginal fuel costs and any indirect costs associated with using a particular type of energy. It is calculated in

MCFU (ENDUSE,TECH,EC,YEAR)**: Marginal Cost of Fuel Use** ($/mBtu or $/GJ)

The marginal cost of fuel use(MCFU) is computed in the demand sector and is the sum of the annualized capital cost of the device plus the device operation and maintenance costs plus the unit cost of fuel. It is used to determine the level of process efficiency picked by the consumer.

MCFU (ENDUSE,TECH,EC,YEAR)**: Marginal Cost of Fuel Use** ($/mBtu or $/GJ)

The marginal cost of fuel use(MCFU) is computed in the demand sector and is the sum of the annualized capital cost of the device plus the device operation and maintenance costs plus the unit cost of fuel. It is used to determine the level of process efficiency picked by the consumer.

MCFU0 (ENDUSE,TECH,EC,FIRST)**: Marginal Cost of Fuel Use** ($/mBtu or $/GJ)

The marginal cost of fuel use(MCFU) is computed in the demand sector and is the sum of the annualized capital cost of the device plus the device operation and maintenance costs plus the unit cost of fuel. It is used to determine the level of process efficiency picked by the consumer.

MCFU0 (ENDUSE,TECH,EC,FIRST)**: Marginal Cost of Fuel Use** ($/mBtu or $/GJ)

The marginal cost of fuel use(MCFU) is computed in the demand sector and is the sum of the annualized capital cost of the device plus the device operation and maintenance costs plus the unit cost of fuel. It is used to determine the level of process efficiency picked by the consumer.

MCFU1 (CENDUSE,ENDUSE,TECH,EC)**: Marginal Cost of Fuel Use** ($/mBtu or $/GJ)

The marginal cost of fuel use(MCFU) is computed in the demand sector and is the sum of the annualized capital cost of the device plus the device operation and maintenance costs plus the unit cost of fuel. It is used to determine the level of process efficiency picked by the consumer.

MCFU1 (CENDUSE,ENDUSE,TECH,EC)**: Marginal Cost of Fuel Use** ($/mBtu or $/GJ)

The marginal cost of fuel use(MCFU) is computed in the demand sector and is the sum of the annualized capital cost of the device plus the device operation and maintenance costs plus the unit cost of fuel. It is used to determine the level of process efficiency picked by the consumer.

MDF (YEAR)**: Municipal Debt Fraction** (DLESS)

The municipal debt fraction divides the utility's total debt into a regulated and municipal components for different regulatory and tax treatments

MDF (YEAR)**: Municipal Debt Fraction** (DLESS)

The municipal debt fraction divides the utility's total debt into a regulated and municipal components for different regulatory and tax treatments

MDP (YEAR)**: Minimum Demand for Power** (MW)

The minimum MW required to serve electric load during the year. It is the minimum of the monthly peak demands. It is calculated in the demand sectors.

MDP (YEAR)**: Minimum Demand for Power** (MW)

The minimum MW required to serve electric load during the year. It is the minimum of the monthly peak demands. It is calculated in the demand sectors.

MDPDIF (YEAR)**: MDP Different from XMDP** MW

This value represents the difference between the actual and the forecasted load values. It is used in the exogenous specification of future demand. The exogenous forecast is adjusted to reflect the differences between the loads.

MDPDIF (YEAR)**: MDP Different from XMDP** (MW)

This value represents the difference between the actual and the forecasted load values. It is used in the exogenous specification of future demand. The exogenous forecast is adjusted to reflect the differences between the loads.

MDPGI : Initial Growth Rate for Min. Demand (1/YR)

An exogenously specified input variable used to initialize the model.

MDPGI : Initial Growth Rate for Min. Demand (1/YR)

An exogenously specified input variable used to initialize the model.

MDPGR (HORIZON,YEAR)**: MDP Growth Rate** (1/YR)

Based on the smoothing function (MDPSM) and a smoothing constant (USMT), a growth rate is computed (MDPGR) for the minimum load.

MDPGR (HORIZON,YEAR)**: MDP Growth Rate** (1/YR)

Based on the smoothing function (MDPSM) and a smoothing constant (USMT), a growth rate is computed (MDPGR) for the minimum load.

MDPM : Minimum Electric Load

Minimum electric load is the minimum point of the system load duration curve plus any pumped storage.

MDPM : Minimum Electric Load

Minimum electric load is the minimum point of the system load duration curve plus any pumped storage.

MDPSM (HORIZON,LV2,YEAR)**: Smoothed MDP Level for Extrap. Macro (MW)** (MW)

This is the intermediate value of the smoothing functions for minimum load. Two versions are calculated one using the historical averaging time and the other the smoothing time. It is used to compute the minimum load growth rate.

MDPSM (HORIZON,LV2,YEAR)**: Smoothed MDP Level for Extrap. Macro (MW)** (MW)

This is the intermediate value of the smoothing functions for minimum load. Two versions are calculated one using the historical averaging time and the other the smoothing time. It is used to compute the minimum load growth rate.

MDS (DISPATCH,MONTH)**: Maximum Demand Satisfied by Plant** MW

The maximum demand satisfied by dispatch type MDS is the minimum of either the effective generating capacity taking into account the operational outage rate or the peak demand.

MDS (DISPATCH,MONTH)**: Maximum Demand Satisfied by Plant** (MW)

The maximum demand satisfied by dispatch type MDS is the minimum of either the effective generating capacity taking into account the operational outage rate or the peak demand.

MECFP (ENDUSE,TECH,EC)**: Efficiency Decision Fuel Price** ($/mBtu)

This fuel price is calculated in the procedure DMARGINAL in the demand sector as price that corresponds to the efficiency level selected. MECFP is then used in DDSM procedure to calculate DEE(finds the corresponding DEE in the DTABPE table to the MECFP selected.

MECFP (ENDUSE,TECH,EC)**: Efficiency Decision Fuel Price** ($/mBtu)

This fuel price is calculated in the procedure DMARGINAL in the demand sector as price that corresponds to the efficiency level selected. MECFP is then used in DDSM procedure to calculate DEE(finds the corresponding DEE in the DTABPE table to the MECFP selected.

MILD (POWER)**: Maximum Base Load Power Duration** (HOURS/YR)

MILD is the point on the future load duration curve which represents the minimum number of hours of load that would be service by a base load plant or, conversely, the maximum number of hours that could be served by a peaking plant. It is also called minimum intermediate load duration. It is a user input.

MILD (POWER)**: Maximum Base Load Power Duration** (HOURS/YR)

MILD is the point on the future load duration curve which represents the minimum number of hours of load that would be service by a base load plant or, conversely, the maximum number of hours that could be served by a peaking plant. It is also called minimum intermediate load duration. It is a user input.

MILP :

MILP is the value in megawatts that "MILD" represents on the load curve and is the load that must be satisfied by base- or intermediate-load plants.

MILP :

MILP is the value in megawatts that "MILD" represents on the load curve and is the load that must be satisfied by base- or intermediate-load plants.

MINLD MONTH**: Monthly Minimum Load** (MW/montH)

Calculated in the demand procedures and residing in SOUTPUT, this variable exogenous to the electric sector. It is used in the calculation of the minimum demand for power (MDPM)

MINLD MONTH**: Monthly Minimum Load** MW/month

Calculated in the demand procedures and residing in SOUTPUT, this variable exogenous to the electric sector. It is used in the calculation of the minimum demand for power (MDPM)

MISCDED (YEAR)**: Miscellaneous Deductions** (M$)

A calibrated variable used in the calculation of accumulated depreciation.

MISCDED (YEAR)**: Miscellaneous Deductions** (M$)

A calibrated variable used in the calculation of accumulated depreciation.

MISCDPR (AA,YEAR)**: Miscellaneous Depreciation** ($M/YR)

A calibrated variable representing non-plant depreciation included in the calculation of accumulated depreciation (ACDP).

MISCDPR (AA,YEAR)**: Miscellaneous Depreciation** ($M/YR)

A calibrated variable representing non-plant depreciation included in the calculation of accumulated depreciation (ACDP).

MISCEXP (YEAR)**: Miscellaneous Expenses** (M$)

A calibrated variable representing non-generating plant expenses and is included in the calculation of operating expenses (OPEXP).

MISCEXP (YEAR)**: Miscellaneous Expenses** (M$)

A calibrated variable representing non-generating plant expenses and is included in the calculation of operating expenses (OPEXP).

MISCFN (YEAR)**: Misc. Projects to be Financed** (M$)

A calibrated variable representing the cost non-generating plant projects and is included in the calculation of financing required (FNRQ).

MISCFN (YEAR)**: Misc. Projects to be Financed** (M$)

A calibrated variable representing the cost non-generating plant projects and is included in the calculation of financing required (FNRQ).

MISCFR (AA,YEAR)**: Miscellaneous Additions to Gross Assets Fraction** ($/$)

A calibrated variable used in the calculation of miscellaneous additions to gross assets.

MISCFR (AA,YEAR)**: Miscellaneous Additions to Gross Assets Fraction** ($/$)

A calibrated variable used in the calculation of miscellaneous additions to gross assets.

MISCGA (AA,YEAR)**: Misc. Additions to Gross Assets** (M$)

The miscellaneous additions to gross assets is a function of the amount of gross assets and the calibrated miscellaneous additions to gross assets fraction.

MISCGA (AA,YEAR)**: Misc. Additions to Gross Assets** (M$)

The miscellaneous additions to gross assets is a function of the amount of gross assets and the calibrated miscellaneous additions to gross assets fraction.

MMSF (ENDUSE,TECH,EC,YEAR)**: Market Share Fraction by Device** ($/$)

The Marginal Share Fractions(MMSF) are a function of both price and non-price factors. The price factors are the cost of using fuel(MCFU), the marginal process efficiency(PEE) and the process capital cost(PCC). Non-price factors(MSMM) include poor consumer information plus other non-price fuel attributes. The calculation of MMSF is performed in the demand sector and it is used to split the PCAs(production capacity additions) to derive the EUPCAs(production capacity additions by enduse).

MMSF (ENDUSE,TECH,EC,YEAR)**: Market Share Fraction by Device** ($/$)

The Marginal Share Fractions(MMSF) are a function of both price and non-price factors. The price factors are the cost of using fuel(MCFU), the marginal process efficiency(PEE) and the process capital cost(PCC). Non-price factors(MSMM) include poor consumer information plus other non-price fuel attributes. The calculation of MMSF is performed in the demand sector and it is used to split the PCAs(production capacity additions) to derive the EUPCAs(production capacity additions by enduse).

MMSF1 (ENDUSE,TECH,EC,YEAR)**: Market Share Fraction by Device** ($/$)

The Marginal Share Fractions(MMSF) are a function of both price and non-price factors. The price factors are the cost of using fuel(MCFU), the marginal process efficiency(PEE) and the process capital cost(PCC). Non-price factors(MSMM) include poor consumer information plus other non-price fuel attributes. The calculation of MMSF is performed in the demand sector and it is used to split the PCAs(production capacity additions) to derive the EUPCAs(production capacity additions by enduse).

MMSF1 (ENDUSE,TECH,EC,YEAR)**: Market Share Fraction by Device** ($/$)

The Marginal Share Fractions(MMSF) are a function of both price and non-price factors. The price factors are the cost of using fuel(MCFU), the marginal process efficiency(PEE) and the process capital cost(PCC). Non-price factors(MSMM) include poor consumer information plus other non-price fuel attributes. The calculation of MMSF is performed in the demand sector and it is used to split the PCAs(production capacity additions) to derive the EUPCAs(production capacity additions by enduse).

MMSM0 (ENDUSE,TECH,EC,YEAR)**: Non-price Factors** ($/$)

The non-price factors(MMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. MMSM0 is used to modify the market allocation weight which is used to determine the market share for each fuel in the demand sector.

MMSM0 (ENDUSE,TECH,EC,YEAR)**: Non-price Factors** ($/$)

The non-price factors(MMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. MMSM0 is used to modify the market allocation weight which is used to determine the market share for each fuel in the demand sector.

MMSMI (ENDUSE,TECH,EC)**: Market Share Multiplier from Income** ($/$)

The MMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The MMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs.

MMSMI (ENDUSE,TECH,EC)**: Market Share Multiplier from Income** ($/$)

The MMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The MMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs.

MONOUT (MONTH)**: Monthly Output** gWh/month

This variable is calculated in the supply sector and is used in the calculation of average demand.

MONOUT (MONTH)**: Monthly Output** GWh/month

This variable is calculated in the supply sector and is used in the calculation of average demand.

MONTHS (MONTH)**: Months per Season** (DLESS)

The model uses five seasons and distributes the months among them.

MONTHS (MONTH)**: Months per Season** (DLESS)

The model uses five seasons and distributes the months among them.

MPS (PLANT,YEAR)**: Minimum Plant Size** (MW)

Minimum plant size is the unit size specification by plant type for new construction. It is an exogenously specified variable and call be changed for policy testing.

MPS (PLANT,YEAR)**: Minimum Plant Size** (MW)

Minimum plant size is the unit size specification by plant type for new construction. It is an exogenously specified variable and call be changed for policy testing.

MREV : Market Revenue $M

Market revenue is equal to the allowed return on common stock and retained earnings minus total costs for O&M, purchased power and fuel, depreciation, taxes, miscellaneous expenses, debt interest and dividends on preferred stock.

MREV : Market Revenue $M

Market revenue is equal to the allowed return on common stock and retained earnings minus total costs for O&M, purchased power and fuel, depreciation, taxes, miscellaneous expenses, debt interest and dividends on preferred stock.

MRF (YEAR)**: Municipal Revenue Fraction** (Dless)

The fraction of revenue derived from municipal assets is exogenously specified. MRF is used in determining taxable income.

MRF (YEAR)**: Municipal Revenue Fraction** (Dless)

The fraction of revenue derived from municipal assets is exogenously specified. MRF is used in determining taxable income.

MROIL : Must Run Oil (MW)

The model simulates "must-run" oil/gas facilities by separating oil/gas plants into a dispatchable and a must-run portion. The must-run portion is estimated from utility data.

MROIL : Must Run Oil MW

The model simulates "must-run" oil/gas facilities by separating oil/gas plants into a dispatchable and a must-run portion. The must-run portion is estimated from utility data.

MRPAF : Plant Availability Fraction for Must Run Plants Dless

A estimated variable that measures the availability of the must run plants. Similar to PAF.

MRPAF : Plant Availability Fraction for Must Run Plants Dless

A estimated variable that measures the availability of the must run plants. Similar to PAF.

MSMM (ENDUSE,TECH,YEAR)**: Market Potential Multiplier**

The Market Potential Multiplier(MSMM) is a policy variable that modifies the non-price factors influencing the marginal fuel share(MSF) calculation in the demand sector. For example, an information program to promote heat pumps may change consumer attitudes about unreliability or unsuitability for their climates and enhance the non-price factors for electric technology. Similarly, an information program concerning the reliability, safety and availability of natural gas space cooling could enhance the natural gas market share for that enduse. Since MSMM is a policy variable, the default value in the baseline scenario is usually one(not used).

MSMM (ENDUSE,TECH,YEAR)**: Market Potential Multiplier**

The Market Potential Multiplier(MSMM) is a policy variable that modifies the non-price factors influencing the marginal fuel share(MSF) calculation in the demand sector. For example, an information program to promote heat pumps may change consumer attitudes about unreliability or unsuitability for their climates and enhance the non-price factors for electric technology. Similarly, an information program concerning the reliability, safety and availability of natural gas space cooling could enhance the natural gas market share for that enduse. Since MSMM is a policy variable, the default value in the baseline scenario is usually one(not used).

MTAX (YEAR)**: Municipal Property Tax** (M$/YR)

Municipal property taxes are the sum over assets of municipal portion of net assets times the municipal tax rate.

MTAX (YEAR)**: Municipal Property Tax** (M$/YR)

Municipal property taxes are the sum over assets of municipal portion of net assets times the municipal tax rate.

MTAXR (AA,YEAR)**: Municipal Property Tax Rate** (1/YR)

An exogenously specified input variable used to calculate the municipal property taxes.

MTAXR (AA,YEAR)**: Municipal Property Tax Rate** (1/YR)

An exogenously specified input variable used to calculate the municipal property taxes.

MTCR : Maximum Tax Credit Fraction

The utility can claim 85% of its income tax obligation before investment tax credits or the level of accumulated credits, whichever is less. MTCR is the fraction representing the 85%.

MTCR : Maximum Tax Credit Fraction

The utility can claim 85% of its income tax obligation before investment tax credits or the level of accumulated credits, whichever is less. MTCR is the fraction representing the 85%.

MTIER (YEAR)**: Municipal Times-Interest-Earned Regulation**

An exogenously specified regulatory policy variable used in the calculation of operating income from municipal debt.

MTIER (YEAR)**: Municipal Times-Interest-Earned Regulation**

An exogenously specified regulatory policy variable used in the calculation of operating income from municipal debt.

MUFC (PLANT)**: Marginal Unit Fuel Cost** Mills/kWh

The unit fuel cost of new plants is equal to the unit fuel cost multiplied by the ratio of the marginal to the average heat rate.

MUFC (PLANT)**: Marginal Unit Fuel Cost** Mills/kWh

The unit fuel cost of new plants is equal to the unit fuel cost multiplied by the ratio of the marginal to the average heat rate.

MVAU : Marginal Value of Alternative Utility ($/$)

The marginal value of alternative utility represents the opportunity cost of the foregone consumer alternative. If a consumer chooses to spend money retrofitting, he or she must forego, in the short run anyway, other purchases that would generate satisfaction. MVAU represents this lost satisfaction. It is used in the calculation of the retrofit market share fraction in the retrofit procedure of the demand sector.

MVAU : Marginal Value of Alternative Utility ($/$)

The marginal value of alternative utility represents the opportunity cost of the foregone consumer alternative. If a consumer chooses to spend money retrofitting, he or she must forego, in the short run anyway, other purchases that would generate satisfaction. MVAU represents this lost satisfaction. It is used in the calculation of the retrofit market share fraction in the retrofit procedure of the demand sector.

MVDR (ENDUSE,TECH,CTECH,EC,YEAR)**: Marginal Value of Device Retrofits** ($/$)

The marginal value of retrofitting is calculated in the retrofit procedure in the demand sector as the difference in efficiencies(calculated using local fuel prices) divided by annualized cost of the new device, less any subsidies. It captures the increase in value from device retrofitting in marginal value of retrofit equation(MVR).

MVDR (ENDUSE,TECH,CTECH,EC,YEAR)**: Marginal Value of Device Retrofits** ($/$)

The marginal value of retrofitting is calculated in the retrofit procedure in the demand sector as the difference in efficiencies(calculated using local fuel prices) divided by annualized cost of the new device, less any subsidies. It captures the increase in value from device retrofitting in marginal value of retrofit equation(MVR).

MVDR0 (ENDUSE,TECH,CTECH,EC,FIRST)**: Marginal Value of Device Retrofits** ($/$)

The marginal value of retrofitting is calculated in the retrofit procedure in the demand sector as the difference in efficiencies(calculated using local fuel prices) divided by annualized cost of the new device, less any subsidies. It captures the increase in value from device retrofitting in marginal value of retrofit equation(MVR).

MVDR0 (ENDUSE,TECH,CTECH,EC,FIRST)**: Marginal Value of Device Retrofits** ($/$)

The marginal value of retrofitting is calculated in the retrofit procedure in the demand sector as the difference in efficiencies(calculated using local fuel prices) divided by annualized cost of the new device, less any subsidies. It captures the increase in value from device retrofitting in marginal value of retrofit equation(MVR).

MVDU (ENDUSE,TECH,EC,YEAR)**: Marginal Value of Device Usage** ($/$)

Marginal value of device usage(MVDU) is a function of the indicated engineering budget multiplier(IBM), fuel prices(ECFP), average device and process efficiencies(DEEA, PEEA), and average process capital cost(APCC). It is used to calculate the BMSF by device. All equations are found in the demand sector.

MVDU (ENDUSE,TECH,EC,YEAR)**: Marginal Value of Device Usage** ($/$)

Marginal value of device usage(MVDU) is a function of the indicated engineering budget multiplier(IBM), fuel prices(ECFP), average device and process efficiencies(DEEA, PEEA), and average process capital cost(APCC). It is used to calculate the BMSF by device. All equations are found in the demand sector.

MVDU0 (ENDUSE,TECH,EC,FIRST)**: Marginal Value of Device Usage** ($/$)

Marginal value of device usage(MVDU) is a function of the indicated engineering budget multiplier(IBM), fuel prices(ECFP), average device and process efficiencies(DEEA, PEEA), and average process capital cost(APCC). It is used to calculate the BMSF by device. All equations are found in the demand sector.

MVDU0 (ENDUSE,TECH,EC,FIRST)**: Marginal Value of Device Usage** ($/$)

Marginal value of device usage(MVDU) is a function of the indicated engineering budget multiplier(IBM), fuel prices(ECFP), average device and process efficiencies(DEEA, PEEA), and average process capital cost(APCC). It is used to calculate the BMSF by device. All equations are found in the demand sector.

MVF (ENDUSE,TECH,EC)**: Market Share Variance Factor** ($/$)

The market share variance factor(MVF) is a calibrated variable used in the calculation of MMSM in the demand sector.

MVF (ENDUSE,TECH,EC)**: Market Share Variance Factor** ($/$)

The market share variance factor(MVF) is a calibrated variable used in the calculation of MMSM in the demand sector.

MVPR (ENDUSE,TECH,EC,YEAR)**: Marginal Value of Process Retrofits** ($/$)

The MVPR is a function of the marginal cost of fuel use modified by the change in process efficiency due to the retrofit and to the change in the capital cost due to any subsidy. This calculation occurs in the demand sector and is used to calculate the retrofit process market share fraction(RPMSF).

MVPR (ENDUSE,TECH,EC,YEAR)**: Marginal Value of Process Retrofits** ($/$)

The MVPR is a function of the marginal cost of fuel use modified by the change in process efficiency due to the retrofit and to the change in the capital cost due to any subsidy. This calculation occurs in the demand sector and is used to calculate the retrofit process market share fraction(RPMSF).

MVPR0 (ENDUSE,TECH,EC,FIRST)**: Marginal Value of Process Retrofits** ($/$)

The MVPR is a function of the marginal cost of fuel use modified by the change in process efficiency due to the retrofit and to the change in the capital cost due to any subsidy. This calculation occurs in the demand sector and is used to calculate the retrofit process market share fraction(RPMSF).

MVPR0 (ENDUSE,TECH,EC,FIRST)**: Marginal Value of Process Retrofits** ($/$)

The MVPR is a function of the marginal cost of fuel use modified by the change in process efficiency due to the retrofit and to the change in the capital cost due to any subsidy. This calculation occurs in the demand sector and is used to calculate the retrofit process market share fraction(RPMSF).

MVR (ENDUSE,TECH,CTECH,EC,YEAR)**: Marginal Value Retrofits** ($/$)

The marginal value of retrofits is calculated as the marginal value of device retrofits times the retrofit device market share fraction in the retrofit procedure in the demand sector. It is used in the retrofit market share calculation in the demand sector.

MVR (ENDUSE,TECH,CTECH,EC,YEAR)**: Marginal Value Retrofits** ($/$)

The marginal value of retrofits is calculated as the marginal value of device retrofits times the retrofit device market share fraction in the retrofit procedure in the demand sector. It is used in the retrofit market share calculation in the demand sector.

MVR0 (ENDUSE,TECH,CTECH,EC,FIRST)**: Marginal Value Retrofits** ($/$)

The marginal value of retrofits is calculated as the marginal value of device retrofits times the retrofit device market share fraction in the retrofit procedure in the demand sector. It is used in the retrofit market share calculation in the demand sector.

MVR0 (ENDUSE,TECH,CTECH,EC,FIRST)**: Marginal Value Retrofits** ($/$)

The marginal value of retrofits is calculated as the marginal value of device retrofits times the retrofit device market share fraction in the retrofit procedure in the demand sector. It is used in the retrofit market share calculation in the demand sector.

NA (AA,YEAR)**: Net Assets** (M$)

Net assets represents the net plant-in-service after allowance for depreciation. They grow with investments in an identical fashion as gross assets. The are reduced by depreciation. The primary use of net assets is to calculate the rate-base in the regulatory portion

NA (AA,YEAR)**: Net Assets** (M$)

Net assets represents the net plant-in-service after allowance for depreciation. They grow with investments in an identical fashion as gross assets. The are reduced by depreciation. The primary use of net assets is to calculate the rate-base in the regulatory portion

NCERR (YEAR)**: Net Earnings Certificate Ratio** (DLESS)

The net earnings certificate ratio is based on a measure of earnings available (NETEN) to make interest payments (DBIN).

NCERR (YEAR)**: Net Earnings Certificate Ratio** (DLESS)

The net earnings certificate ratio is based on a measure of earnings available (NETEN) to make interest payments (DBIN).

NDFTX (YEAR)**: Net Deferred Taxes from Depreciation** (M$/YR)

The annual net deferred taxes equal the difference in the taxes due to straight line depreciation versus accelerated depreciaton if accounting is normalized. NDFTX equals the negative of amortized deferred taxes if accounting is flow-through.

NDFTX (YEAR)**: Net Deferred Taxes from Depreciation** (M$/YR)

The annual net deferred taxes equal the difference in the taxes due to straight line depreciation versus accelerated depreciation if accounting is normalized. NDFTX equals the negative of amortized deferred taxes if accounting is flow-through.

NECRD (YEAR)**: Net Earnings to Cert. Ratio Desired** (DLESS)

An exogenously specified input variable used in the calculation of the limit on long term debt.

NECRD (YEAR)**:** **Net Earnings to Cert. Ratio Desired** (DLESS)

An exogenously specified input variable used in the calculation of the limit on long term debt.

NETEN (YEAR)**:** **Net Earnings** (M$/YR)

Net earnings are operating plus non-operating earnings, minus disallowed earnings.

NETEN (YEAR)**:** **Net Earnings** (M$/YR)

Net earnings are operating plus non-operating earnings, minus disallowed earnings.

NMAF : **Switch for Tax Effect of AFUDC** (DLESS)

If there are municipal property taxes then this switch is set to equal one in the AFNTR (net rate for AFUDC) equation.

NMAF : **Switch for Tax Effect of AFUDC** (DLESS)

If there are municipal property taxes then this switch is set to equal one in the AFNTR (net rate for AFUDC) equation.

NMDP : **Switch for Liberalized Depreciation** (DLESS)

This switch causes the net deferred taxes from depreciation to be calculated using the liberalized depreciation and double declining balance method of normalized accounting.

NMDP : **Switch for Liberalized Depreciation** (DLESS)

This switch causes the net deferred taxes from depreciation to be calculated using the liberalized depreciation and double declining balance method of normalized accounting.

NMTC : **Normalization Switch for Tax Credits** (DLESS)

This switch signals the use of flow-through accounting allowing claimed tax credits to be subtracted form test year income tax reported.

NMTC : **Normalization Switch for Tax Credits** (DLESS)

This switch signals the use of flow-through accounting allowing claimed tax credits to be subtracted form test year income tax reported.

NPGC (POWER,YEAR)**:** **Net New Capacity Requirements** (MW)

Due to flexibility between power types, new capacity is not constructed unless the system as a whole needs capacity. The net new capacity requirements is equal to the sum of the gross requirements, but not less than zero.

NPGC (POWER,YEAR)**: Net New Capacity Requirements** (MW)

Due to flexibility between power types, new capacity is not constructed unless the system as a whole needs capacity. The net new capacity requirements is equal to the sum of the gross requirements, but not less than zero.

NTINC (YEAR)**: Net Income** (M$/YR)

Net income is income befor dividends and interest payments (INCBI) less interest payments and AFC from debt.

NTINC (YEAR)**: Net Income** (M$/YR)

Net income is income before dividends and interest payments (INCBI) less interest payments and AFC from debt.

NUCRB (YEAR)**: Nuclear Construciton Allowed in Rate Base** ($M)

The fraction of nuclear costs that can go into the rate base starts out as an exogenously specified input. Then NUCRB becomes the lesser either itself or the CW portion of the deferred rate base and the AFUDC portion of the deferred rate base.

NUCRB (YEAR)**: Nuclear Construction Allowed in Rate Base** ($M)

The fraction of nuclear costs that can go into the rate base starts out as an exogenously specified input. Then NUCRB becomes the lesser either itself or the CW portion of the deferred rate base and the AFUDC portion of the deferred rate base.

NUMLCFR : Nuclear Min. Load Constraint Fraction

The nuclear minimum load constraint fraction recognizes that a nuclear power plant is most effectively used at full power. The minimum demand multiplied by NUMLCFR equals the maximum MW load nuclear power can follow. NUMLCFR is exogenously specified and has a typical value of 1.3.

NUMLCFR : Nuclear Min. Load Constraint Fraction

The nuclear minimum load constraint fraction recognizes that a nuclear power plant is most effectively used at full power. The minimum demand multiplied by NUMLCFR equals the maximum MW load nuclear power can follow. NUMLCFR is exogenously specified and has a typical value of 1.3.

OGCV : Generation Capacity Converted from Oil to Gas MW

An exogenously specified input variable used in the calculation of generation capacity complete rate for gas that includes both new plants and conversions.

OGCV : Generation Capacity Converted from Oil to Gas (MW)

An exogenously specified input variable used in the calculation of generation capacity complete rate for gas that includes both new plants and conversions.

OGCVCST : Generation Capacity Oil to Gas Conversion Costs $/kW

The cost of converting oil plants to gas is an exogenous input to the model.

OGCVCST : Generation Capacity Oil to Gas Conversion Costs $/kW

The cost of converting oil plants to gas is an exogenous input to the model.

OILFR (YEAR)**: Fraction of Oil/Gas which is Oil** (FRAC.)

Oil/gas plants can switch fuels as economics justify. OILFR, the fraction of generation using oil is calculated as a market share process that was estimated using historical data

OILFR (YEAR)**: Fraction of Oil/Gas which is Oil** (FRAC.)

Oil/gas plants can switch fuels as economics justify. OILFR, the fraction of generation using oil is calculated as a market share process that was estimated using historical data

OM (FUEL,YEAR)**: Operation/Maintenance Costs** (M$/YR)

OM(operation/maintenance costs) are calculated by summing operations and maintenance costs by technology, EC and fuel (TOM) over technology and EC.

OM (FUEL,YEAR)**: Operation/Maintenance Costs** (M$/YR)

OM(operation/maintenance costs) are calculated by summing operations and maintenance costs by technology, ec and fuel(TOM) over technology and ec.

OMC (PLANT,YEAR)**: Operation and Maintenance Costs** (M$/YR)

Real unit operating and maintenance costs (UOMC and UFOMC) are exogenously supplied to the model. O&M costs are multiplied by the electricity generated (EG) and the fixed costs by the generation capacity (GC). Summed together and adjusted for inflation they yield total operation and maintenance costs.

OMC (PLANT,YEAR)**: Operation and Maintenance Costs** (M$/YR)

Real unit operating and maintenance ocsts (UOMC and UFOMC) are exogenously supplied to the model. O&M costs are multiplied by the electricity generated (EG) and the fixed costs by the generation capacity (GC). Summed together and adjusted for inflation they yeild total operation and maintenance costs.

OOR (DISPATCH,YEAR)**: Operational Outage Rate** (Fraction)

A calibrated variable approximating operational outages used in determining the maximum demand satisfied by dispatch type.

OOR (DISPATCH,YEAR)**: Operational Outage Rate** (Fraction)

A calibrated variable approximating operational outages used in determining the maximum demand satisfied by dispatch type.

OPEXP (YEAR)**: Operating Expenses** (M$/YR)

Operating expenses are defined as the sum of all variable costs, reported income taxes, reported property taxes, and straight-line depreciation.

OPEXP (YEAR)**: Operating Expenses** (M$/YR)

Operating expenses are defined as the sum of all variable costs, reported income taxes, reported property taxes, and straight-line depreciation.

OPFR (PLANT,YEAR)**: Fractional Year New Plant is Operational**

OPFR captures the impact of a plant going into operation for a fraction of the year rather than the entire year. It is used in plant capacity factor calculation.

OPFR (PLANT,YEAR)**: Fractional Year New Plant is Operational**

OPFR captures the impact of a plant going into operation for a fraction of the year rather than the entire year. It is used in plant capacity factor calculation.

OPINC (YEAR)**: Operating Income** (M$/YR)

Operating income is calculated as the total revenue from electric sales less operating expenses.

OPINC (YEAR)**: Operating Income** (M$/YR)

Operating income is calculated as the total revenue from electric sales less operating expenses.

OTINC (YEAR)**: Other Income** (M$/YR)

The utility also recieves other income from other investments (SI). The model assumes these investments are in government bonds or at least earn the return on bonds (SIIR).

OTINC (YEAR)**: Other Income** (M$/YR)

The utility also receives other income from other investments (SI). The model assumes these investments are in government bonds or at least earn the return on bonds (SIIR).

PAF (PLANT,MONTH,YEAR)**: Plant Availability Frac.** (MW/MW)

Plants have scheduled maintenance and a history of unscheduled outages. The plant availablity factor is calculated from the scheduled and unscheduled outage rates. It is used in the calculation of effective firm generating capacity.

PAF (PLANT,MONTH,YEAR)**: Plant Availability Frac.** (MW/MW)

Plants have scheduled maintenance and a history of unscheduled outages. The plant availability factor is calculated from the scheduled and unscheduled outage rates. It is used in the calculation of effective firm generating capacity.

PBASE (FUEL)**: Pollution Base** (tBtu/YEAR)

PC (ECC,YEAR)**: Production Capacity** (M$/YR)

All Investments in Production Capacity(PC) come from economic models - in most cases for ENERGY 2020, the REMI model is used. It is the changes in this investment from year to year that drives the model. The estimated future production capacity is the principal driver of energy demand.

PC (ECC,YEAR)**: Production Capacity** (M$/YR)

All Investments in Production Capacity(PC) come from economic models - in most cases for ENERGY 2020, the REMI model is used. It is the changes in this investment from year to year that drives the model. The estimated future production capacity is the principal driver of energy demand.

PC0 (ECC,FIRST)**: Production Capacity** (M$/YR)

All Investments in Production Capacity(PC) come from economic models - in most cases for ENERGY 2020, the REMI model is used. It is the changes in this investment from year to year that drives the model. The estimated future production capacity is the principal driver of energy demand.

PC0 (ECC,FIRST)**: Production Capacity** (M$/YR)

All Investments in Production Capacity(PC) come from economic models - in most cases for ENERGY 2020, the REMI model is used. It is the changes in this investment from year to year that drives the model. The estimated future production capacity is the principal driver of energy demand.

PCA (AGE,ECC,YEAR)**: Production Capacity Additions** ((M$/YR)/YR)

The total change in investment in production capacity additions from year to year is affected in part by energy prices. Usually, this price feedback loop is made endogenous by connecting the REMI model with ENERGY 2020 and letting the changing fuel prices in ENERGY 2020 flow back into REMI. An output from the economy sector, PCA is transformed into EUPCA in the demand sector.

PCA (AGE,ECC,YEAR)**: Production Capacity Additions** ((M$/YR)/YR)

The total change in investment in production capacity additions from year to year is affected in part by energy prices. Usually, this price feedback loop is made endogenous by connecting the REMI model with ENERGY 2020 and letting the changing fuel prices in ENERGY 2020 flow back into REMI. An output from the economy sector, PCA is transformed into EUPCA in the demand sector.

PCC (ENDUSE,TECH,EC,YEAR)**: Process Capital Cost** ($/($/YR))

The determination of the level of process capital cost selected by consumers depends on the level of efficiency chosen which in turn depends on the price of energy. ENERGY 2020 also captures technological improvements that can yield more efficiency for the same capital cost. It is calculated in the CMARGINAL procedure in the demand sector as a table function of PEE.

PCC (ENDUSE,TECH,EC,YEAR)**: Process Capital Cost** ($/($/YR))

The determination of the level of process capital cost selected by consumers depends on the level of efficiency chosen which in turn depends on the price of energy. ENERGY 2020 also captures technological improvements that can yield more efficiency for the same capital cost. It is calculated in the CMARGINAL procedure in the demand sector as a table function of PEE.

PCCC (PLANT,YEAR)**: Pollution Control Capital Costs** (($/TON)/YR)

The pollution control capital cost for each plant type is equal to the minimum of either the capital cost of installing the pollution control device or purchasing a credit

PCCC (PLANT,YEAR)**: Pollution Control Capital Costs** (($/TON)/YR)

The pollution control capital cost for each plant type is equal to the minimum of either the capital cost of installing the pollution control device or purchasing a credit

PCCCN (PLANT,POLL,YEAR)**: Pollution Control Capital Real Costs** ($/KW/YR)

An exogenously specified input used in calculating pollution control capital costs (PCCC).

PCCCN (PLANT,POLL,YEAR)**: Pollution Control Capital Real Costs** ($/KW/YR)

An exogenously specified input used in calculating pollution control capital costs (PCCC).

PCCM (EC)**: Process Capital Charge Rate Multiplier** (($/YR)/$)

PCCM is a derived policy variable that is used to calculate the value of incentives(TUINC) to a participant in an efficiency program. It is the ratio of the capital charge with incentives(PCCRU) to the capital charge rate without incentives(PCCR). The variable is calculated in the demand sector.

PCCM (EC)**: Process Capital Charge Rate Multiplier** (($/YR)/$)

PCCM is a derived policy variable that is used to calculate the value of incentives(TUINC) to a participant in an efficiency program. It is the ratio of the capital charge with incentives(PCCRU) to the capital charge rate without incentives(PCCR). The variable is calculated in the demand sector.

PCCMM (ENDUSE,TECH,EC,YEAR)**: Process Cost Maximum Multiplier** ($/$)

PCCMM is a policy variable that can be used to adjust the value of PCC(process capital cost) in the demand sector. Values come from the policy being simulated.

PCCMM (ENDUSE,TECH,EC,YEAR)**: Process Cost Maximum Multiplier** ($/$)

PCCMM is a policy variable that can be used to adjust the value of PCC(process capital cost) in the demand sector. Values come from the policy being simulated.

PCCP (ENDUSE,TECH,EC,YEAR)**: Capital Cost of "Rebated" Process** ($/($/YR))

Used in the conservation and DSM calculations in the demand sector, the capital cost of the rebated process must be at least as expensive as the model generated capital cost - PCC, otherwise consumers would be behaving irrationally by not selecting that process to begin with. The values for PCCP are found in the user-specified policy parameters to be simulated.

PCCP (ENDUSE,TECH,EC,YEAR)**: Capital Cost of "Rebated" Process** ($/($/YR))

Used in the conservation and DSM calculations in the demand sector, the capital cost of the rebated process must be at least as expensive as the model generated capital cost - PCC, otherwise consumers would be behaving irrationally by not selecting that process to begin with. The values for PCCP are found in the user-specified policy parameters to be simulated.

PCCR (EC,ENDUSE,YEAR)**: Process Capital Charge Rate** (($/YR)/$)

The process capital charge rate is the annualization of process capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of process efficiency improvements over the life of the investment. The equation is calculated in the demand sectors and is used to determine the normal process capital cost(*PCCN) which in turn is used to determine the level of process efficiency selected(*PEET)

PCCR (EC,ENDUSE,YEAR)**: Process Capital Charge Rate** (($/YR)/$)

The process capital charge rate is the annualization of process capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of process efficiency improvements over the life of the investment. The equation is calculated in the demand sectors and is used to determine the normal process capital cost(*PCCN) which in turn is used to determine the level of process efficiency selected(*PEET)

PCCRN (EC,ENDUSE,ZERO)**: Process Capital Charge Rate** (($/YR)/$)

The process capital charge rate is the annualization of process capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of process efficiency improvements over the life of the investment. The equation is calculated in the demand sectors and is used to determine the normal process capital cost(*PCCN) which in turn is used to determine the level of process efficiency selected(*PEET)

PCCRN (EC,ENDUSE,ZERO)**: Process Capital Charge Rate** (($/YR)/$)

The process capital charge rate is the annualization of process capital expenses to account for taxes, tax credits, return of principal, return on investment and interest accrued during construction. It is used to apportion the costs of process efficiency improvements over the life of the investment. The equation is calculated in the demand sectors and is used to determine the normal process capital cost(*PCCN) which in turn is used to determine the level of process efficiency selected(*PEET)

PCCRU (EC,ENDUSE,YEAR)**: Process Capital Charge Rate After Policies** (($/YR)/$)

This capital charge rate is computed in the same manner as PCCR with the inclusion of policy investment tax credits(PPIVTC) and interest rate on subsidized loans(CROIN). Subsidized loans and tax credits lower selected annualized process capital costs, therefore encouraging higher levels of process efficiency. This variable is calculated in the demand sectors and is used in the calculation of R

PCCRU (EC,ENDUSE,YEAR)**: Process Capital Charge Rate After Policies** (($/YR)/$)

This capital charge rate is computed in the same manner as PCCR with the inclusion of policy investment tax credits(PPIVTC) and interest rate on subsidized loans(CROIN). Subsidized loans and tax credits lower selected annualized process capital costs, therefore encouraging higher levels of process efficiency. This variable is calculated in the demand sectors and is used in the calculation of R

PCCT (EFFI,ENDUSE,TECH,EC)**: Process Capital Cost Table** ($/mBtu or $/GJ)

A calibrated table indicating the level of efficiency(or fuel price) for each capital cost.

PCCT (EFFI,ENDUSE,TECH,EC)**: Process Capital Cost Table** ($/mBtu or $/GJ)

A calibrated table indicating the level of efficiency(or fuel price) for each capital cost.

PCCU (ENDUSE,TECH,EC,YEAR)**: Policy Capital Cost Increment** ($/($/YR))

This is a rebate offered on capital investments with a certain process efficiency. The values are determined by the program being simulated and the variable is used in calculating efficiency levels in the demand sector.

PCCU (ENDUSE,TECH,EC,YEAR)**: Policy Capital Cost Increment** ($/($/YR))

This is a rebate offered on capital investments with a certain process efficiency. The values are determined by the program being simulated and the variable is used in calculating efficiency levels in the demand sector.

PCF (PLANT,YEAR)**: Plant Capacity Factor** (1/YR)

The plant capacity factor is the ratio of total electricity generated divided by the total potential electricity generation (total MW of capacity available times 8760). It is adjusted by a operating fraction (OPFR) that captures the impact of a plant going into operation for a fraction of the year rather than the entire year.

PCF (PLANT,YEAR)**: Plant Capacity Factor** (1/YR)

The plant capacity factor is the ratio of total electricity generated divided by the total potential electricity generation (total MW of capacity available times 8760). It is adjusted by a operating fraction (OPFR) that captures the impact of a plant going into operation for a fraction of the year rather than the entire year.

PCM (PLANT,POLL)**: Pollution Control multiplier** (Dless)

PCM is an exogenously specified input used in the calculation of PCMM.

PCM (PLANT,POLL)**: Pollution Control multiplier** dless

PCM is an exogenously specified input used in the calculation of PCMM.

PCMM (FUEL,POLL)**: Pollution Control Multiplier by fuel** dless

The pollution control multiplier by fuel is a function of the pollution control multiplier by plant (PCM) weighted by the generating capacity of the plants that use such fuel.

PCMM (FUEL,POLL)**: Pollution Control Multiplier by fuel** (Dless)

The pollution control multiplier by fuel is a function of the pollution control multiplier by plant (PCM) weighted by the generating capacity of the plants that use such fuel.

PCPL (ECC,YEAR)**: Physical Life of Production Capacity** (YRS)

This variable is used to age the physical capital in the model. National or regional data can be used, the current values are from the Massachusetts Energy Office. Production Capacity has the longest lifetime, outlasting both process and device lifetimes. Used in the determination of production capacity retirements.

PCPL (ECC,YEAR)**: Physical Life of Production Capacity** (YRS)

This variable is used to age the physical capital in the model. National or regional data can be used, the current values are from the Massachusetts Energy Office. Production Capacity has the longest lifetime, outlasting both process and device lifetimes. Used in the determination of production capacity retirements.

PCREDIT (POLL)**: Pollution Credits Cost** $/kW

An exogenously specified policy variable used to calculate pollution control capital costs (PCCC) for each plant type.

PCREDIT (POLL)**: Pollution Credits Cost** $/kW

An exogenously specified policy variable used to calculate pollution control capital costs (PCCC) for each plant type.

PCREDIT (POLL,YEAR)**: Pollution Credits Cost** $/KW

PCRV : Differential Charge Revenue ($M)

The differential charge revenue is calculated in the price procedure in the electric sector as the product of the delivery charges and test year sales, by class.

PCRV : Differential Charge Revenue

The differential charge revenue is calculated in the price procedure in the electric sector as the product of the delivery charges and test year sales, by class.

PCTBF (YEAR)**: Pollution Control to be Financed** (M$/YEAR)

PCTC (ENDUSE,TECH,EC)**: Process Capital Trade Off Coefficient**

Used to estimate the Process Efficiency Trade-off Curve. PCTC is calculated from the marginal cost of fuel use(MCFU), the average process efficiency(PEEA), and annualized capital costs. The calculations are found in the initial files.

PCTC (ENDUSE,TECH,EC)**: Process Capital Trade Off Coefficient**

Used to estimate the Process Efficiency Trade-off Curve. PCTC is calculated from the marginal cost of fuel use(MCFU), the average process efficiency(PEEA), and annualized capital costs. The calculations are found in the initial files.

PCUC (PLANT,YEAR)**: Capacity under Construction** (MW)

For accounting purposes, PCUC by plant is calculated from capacity under construction by summing over the levels.

PCUC (PLANT,YEAR)**: Capacity under Construction** (MW)

For accounting purposes, PCUC by plant is calculated from capacity under construction by summing over the levels.

PDP (YEAR)**: Annual Peak Load** MW

The maximum MW required to serve electric load during the year. It is the maximum of the monthly peak demands. It is calculated in the demand sectors.

PDP (YEAR)**: Annual Peak Load** (MW)

The maximum MW required to serve electric load during the year. It is the maximum of the monthly peak demands. It is calculated in the demand sectors.

PDPDIF (YEAR)**: PDP Different from XPDP** MW

This value represents the difference between the actual and the forecasted load values. It is used in the exogenous specification of future demand. The exogenous forecast is adjusted to reflect the differences between the loads.

PDPDIF (YEAR)**: PDP Different from XPDP** (MW)

This value represents the difference between the actual and the forecasted load values. It is used in the exogenous specification of future demand. The exogenous forecast is adjusted to reflect the differences between the loads.

PDPGI : Initial Growth Rate for Peak Demand (1/YR)

An exogenously specified input variable used to initialize the model.

PDPGI : Initial Growth Rate for Peak Demand (1/YR)

An exogenously specified input variable used to initialize the model.

PDPGR (HORIZON,YEAR)**: PDP Growth Rate** (1/YR)

Based on the smoothing function (PDPSM) and a smoothing constand (USMT), a growth rate is computed (PDPGR) for the peak load.

PDPGR (HORIZON,YEAR)**: PDP Growth Rate** (1/YR)

Based on the smoothing function (PDPSM) and a smoothing constant (USMT), a growth rate is computed (PDPGR) for the peak load.

PDPM : Peak Electric Load

Peak electric load is the maximum point of the system load duration curve minus any pumped storage.

PDPM : Peak Electric Load

Peak electric load is the maximum point of the system load duration curve minus any pumped storage.

PDPSM (HORIZON,LV2,YEAR)**: Smoothed PDP Level for Extrapolation Macro (MW)** (MW)

This is the intermediate value of the smoothing functions for peak load. Two versions are calculated one using the historical averaging time and the other the smoothing time. It is used to compute the peak load growth rate.

PDPSM (HORIZON,LV2,YEAR)**: Smoothed PDP Level for Extrapolation Macro (MW)** (MW)

This is the intermediate value of the smoothing functions for peak load. Two versions are calculated one using the historical averaging time and the other the smoothing time. It is used to compute the peak load growth rate.

PE (CLASS,YEAR)**: Price of Electricity** (MILLS/kWh)

The price of electricity has three components that are summed together. Fuel costs (PEFC) are allocated equally across kWh. Differential charges (PEDC) are allocated by customer class. Operating costs (PEOC) are allocated on a contribution to peak bysis by customer class.

PE (CLASS,YEAR)**: Price of Electricity** (MILLS/kWh)

The price of electricity has three components that are summed together. Fuel costs (PEFC) are allocated equally across kWh. Differential charges (PEDC) are allocated by customer class. Operating costs (PEOC) are allocated on a contribution to peak basis by customer class.

PECES (ES,PFUEL,YEAR)**: Primary Energy Consumption** (tBtu/YEAR)

PECES (ES,PFUEL,YEAR)**: Primary Energy Consumption** (tBtu/YEAR)

PECESREG (ES,YEAR)**: Out of Region Energy Consumption** (tBtu/YEAR)

PECESREG (ES,YEAR)**: Out of Region Energy Consumption** (tBtu/YEAR)

PEDC (RTCLASS,YEAR)**: Real Elect. Delivery Chg.** (MILLS/kWh)

Differential charges are allocated by class according to peak contribution. They attempt to capture energy-related cost-to-serve differences between classes. They are a calibrated variable used in the price calculation.

PEDC (RTCLASS,YEAR)**: Real Elect. Delivery Chg.** (MILLS/kWh)

Differential charges are allocated by class according to peak contribution. They attempt to capture energy-related cost-to-serve differences between classes. They are a calibrated variable used in the price calculation.

PEDM (RTCLASS,YEAR)**: Electricity Demand Charge** ($/KW)

The electricity demand charge is calculated in the price procedure from a user specified demand charge fraction (DMCFR) applied to a class's allocation of fixed revenue.

PEDM (RTCLASS,YEAR)**: Electricity Demand Charge** ($/KW)

The electricity demand charge is calculated in the price procedure from a user specified demand charge fraction (DMCFR) applied to a class's allocation of fixed revenue.

PEE (ENDUSE,TECH,EC,YEAR)**: Marginal Process Efficiency** ($/Btu or $/J)

Marginal process efficiency refers to how much process energy is needed per unit of output. The level of process efficiency chosen depends on the cost of using fuel which in turn, depends of Fuel Prices(ECFP), Device Efficiencies(DEE), and Device Capital Cost(DCC). Once a level of device efficiency is chosen, the capital cost is known from trade-off curves contained in the model. These calculations are performed in the demand sector. PEE modified Average Process Efficiency(PEEA).

PEE (ENDUSE,TECH,EC,YEAR)**: Marginal Process Efficiency** ($/Btu or $/J)

Marginal process efficiency refers to how much process energy is needed per unit of output. The level of process efficiency chosen depends on the cost of using fuel which in turn, depends of Fuel Prices(ECFP), Device Efficiencies(DEE), and Device Capital Cost(DCC). Once a level of device efficiency is chosen, the capital cost is known from trade-off curves contained in the model. These calculations are performed in the demand sector. PEE modified Average Process Efficiency(PEEA).

PEE0 (ENDUSE,TECH,EC,FIRST)**: Marginal Process Efficiency** ($/Btu or $/J)

Marginal process efficiency refers to how much process energy is needed per unit of output. The level of process efficiency chosen depends on the cost of using fuel which in turn, depends of Fuel Prices(ECFP), Device Efficiencies(DEE), and Device Capital Cost(DCC). Once a level of device efficiency is chosen, the capital cost is known from trade-off curves contained in the model. These calculations are performed in the demand sector. PEE modified Average Process Efficiency(PEEA).

PEE0 (ENDUSE,TECH,EC,FIRST)**: Marginal Process Efficiency** ($/Btu or $/J)

Marginal process efficiency refers to how much process energy is needed per unit of output. The level of process efficiency chosen depends on the cost of using fuel which in turn, depends of Fuel Prices(ECFP), Device Efficiencies(DEE), and Device Capital Cost(DCC). Once a level of device efficiency is chosen, the capital cost is known from trade-off curves contained in the model. These calculations are performed in the demand sector. PEE modified Average Process Efficiency(PEEA).

PEE01 (CENDUSE,TECH,EC,FIRST)**: Marginal Process Efficiency** ($/Btu or $/J)

Marginal process efficiency refers to how much process energy is needed per unit of output. The level of process efficiency chosen depends on the cost of using fuel which in turn, depends of Fuel Prices(ECFP), Device Efficiencies(DEE), and Device Capital Cost(DCC). Once a level of device efficiency is chosen, the capital cost is known from trade-off curves contained in the model. These calculations are performed in the demand sector. PEE modified Average Process Efficiency(PEEA).

PEE01 (CENDUSE,TECH,EC,FIRST)**: Marginal Process Efficiency** ($/Btu or $/J)

Marginal process efficiency refers to how much process energy is needed per unit of output. The level of process efficiency chosen depends on the cost of using fuel which in turn, depends of Fuel Prices(ECFP), Device Efficiencies(DEE), and Device Capital Cost(DCC). Once a level of device efficiency is chosen, the capital cost is known from trade-off curves contained in the model. These calculations are performed in the demand sector. PEE modified Average Process Efficiency(PEEA).

PEE1 (ENDUSE,TECH,EC,YEAR)**: Marginal Process Efficiency** ($/Btu or $/J)

Marginal process efficiency refers to how much process energy is needed per unit of output. The level of process efficiency chosen depends on the cost of using fuel which in turn, depends of Fuel Prices(ECFP), Device Efficiencies(DEE), and Device Capital Cost(DCC). Once a level of device efficiency is chosen, the capital cost is known from trade-off curves contained in the model. These calculations are performed in the demand sector. PEE modified Average Process Efficiency(PEEA).

PEE1 (ENDUSE,TECH,EC,YEAR)**: Marginal Process Efficiency** ($/Btu or $/J)

Marginal process efficiency refers to how much process energy is needed per unit of output. The level of process efficiency chosen depends on the cost of using fuel which in turn, depends of Fuel Prices(ECFP), Device Efficiencies(DEE), and Device Capital Cost(DCC). Once a level of device efficiency is chosen, the capital cost is known from trade-off curves contained in the model. These calculations are performed in the demand sector. PEE modified Average Process Efficiency(PEEA).

PEEA (ENDUSE,TECH,EC,YEAR)**: Average Process Efficiency** ($/Btu or $/J)

The Average Process Efficiency(PEEA) is the average process efficiency across a particular enduse. It is altered by changes in the Marginal Process Efficiency(PEE). If the PEE is greater than PEEA, then PEEA should be increasing; the converse is also true. In addition to the Marginal Process Efficiency(PEE), the average process efficiency is also affected by the additions to production capacity(EUPC). If the additions each year are large, then the marginal process efficiency will have a larger effect of the average. If the economy isn't growing very much, marginal changes will not have a large impact on the average efficiencies. PEEA is calculated in the demand sector and is used in many equations. It is especially important in the calculation of new process energy requirement additions(PERA) and device energy requirement additions(DERA).

PEEA (ENDUSE,TECH,EC,YEAR)**: Average Process Efficiency** ($/Btu or $/J)

The Average Process Efficiency(PEEA) is the average process efficiency across a particular enduse. It is altered by changes in the Marginal Process Efficiency(PEE). If the PEE is greater than PEEA, then PEEA should be increasing; the converse is also true. In addition to the Marginal Process Efficiency(PEE), the average process efficiency is also affected by the additions to production capacity(EUPC). If the additions each year are large, then the marginal

process efficiency will have a larger effect of the average. If the economy isn't growing very much, marginal changes will not have a large impact on the average efficiencies. PEEA is calculated in the demand sector and is used in many equations. It is especially important in the calculation of new process energy requirement additions(PERA) and device energy requirement additions(DERA).

PEEP (ENDUSE,TECH,EC,YEAR)**: Policy Process Efficiency** ($/Btu or $/J)

This user-specified policy input is used to calculate the process policy participation response(PEER) in the DSM procedure in the demand sector.

PEEP (ENDUSE,TECH,EC,YEAR)**: Policy Process Efficiency** ($/Btu or $/J)

This user-specified policy input is used to calculate the process policy participation response(PEER) in the DSM procedure in the demand sector.

PEER (ENDUSE,TECH,EC,YEAR)**: Process Policy Participation Response** (Btu/Btu OR J/J)

The process policy participation response is calculated in the Process DSM procedure in the demand sector as the ratio of the model generated efficiency(PEE) to the maximum efficiency achievable.

PEER (ENDUSE,TECH,EC,YEAR)**: Process Policy Participation Response** (Btu/Btu OR J/J)

The process policy participation response is calculated in the Process DSM procedure in the demand sector as the ratio of the model generated efficiency(PEE) to the maximum efficiency achievable.

PEET (EFFI,ENDUSE,TECH,EC)**: Process Efficiency Table** (Btu/Btu OR J/J)

The level of process efficiency selected depends on fuel costs. This table relates fuel costs to levels of process efficiency. It is used to calculate the process efficiency(PEE) in the CMARGINAL procedure in the demand sector.

PEET (EFFI,ENDUSE,TECH,EC)**: Process Efficiency Table** (Btu/Btu OR J/J)

The level of process efficiency selected depends on fuel costs. This table relates fuel costs to levels of process efficiency. It is used to calculate the process efficiency(PEE) in the CMARGINAL procedure in the demand sector.

PEFC (YEAR)**: Price of Electric Fuel Component** (MILLS/kWh)

PEFC is calculated for the test year fuel costs (TYFC) divided by the test year sales (TYTSALE). It is one of the three components summed to get prices.

PEFC (YEAR)**: Price of Electric Fuel Component** (MILLS/kWh)

PEFC is calculated for the test year fuel costs (TYFC) divided by the test year sales (TYTSALE). It is one of the three components summed to get prices.

PEG (PFUEL,YEAR)**: Electricity Generated by Primary Fuel** GWH

PEG (PFUEL,YEAR)**: Electricity Generated by Primary Fuel** gWh

PEGC (PFUEL,YEAR)**: Primary Energy Generating Capacity** (MW)

Primary energy generating capacity is the sum of the generating capacity by fuel (GC).

PEGC (PFUEL,YEAR)**: Primary Energy Generating Capacity** MW

Primary energy generating capacity is the sum of the generating capacity by fuel (GC).

PEGCA (PFUEL,YEAR)**: Primary Energy Generating Capacity Additions** (MW)

PEGCA (PFUEL,YEAR)**: Primary Energy Generating Capacity Additions** MW

PEGCAREG (YEAR)**: Out of Region Generating Capacity Additions** (MW)

PEGCAREG (YEAR)**: Out of Region Generating Capacity Additions** MW

PEGCR (PFUEL,YEAR)**: Primary Energy Generating Capacity Retirements** (MW)

PEGCR (PFUEL,YEAR)**: Primary Energy Generating Capacity Retirements** MW

PEGCREG : Out of Region Generating Capacity (MW)

Out-of-region generating capacity is the purchase power capacity available in neighboring regions.

PEGCREG : Out of Region Generating Capacity MW

Out-of-region generating capacity is the purchase power capacity available in neighboring regions.

PEGCRREG (YEAR)**: Out of Region Generating Capacity Retirements** MW

PEGCRREG (YEAR)**: Out of Region Generating Capacity Retirements** (MW)

PEGREG (YEAR)**: Out of Region Purchases** gWh

PEGREG (YEAR)**: Out of Region Purchases** GWH

PEM (ENDUSE,EC)**: Maximum Process Efficiency** ($/mBtu or $/GJ)

Used in the retrofit procedure, PEM is the maximum process efficiency currently obtainable. It is used throughout the retrofit procedure principally as part of a ratio with average process efficiency indicating the percent of possible efficiency now obtained.

PEM (ENDUSE,EC)**: Maximum Process Efficiency** ($/mBtu or $/GJ)

Used in the retrofit procedure, PEM is the maximum process efficiency currently obtainable. It is used throughout the retrofit procedure principally as part of a ratio with average process efficiency indicating the percent of possible efficiency now obtained.

PEMM (ENDUSE,TECH,EC,YEAR)**: Process Technological Improvements** (($/Btu/$Btu) or ($/J/$/J))

PEMM, technological improvements in processes, is a calibrated variable reflecting non-price induced technological improvements which may reduce or improve process efficiency. Processes that become more energy intensive, often by substituting capital for labor, cause more energy to be used per dollar of output. PEMM can change over time and these changes should be evaluated and connected to "real world" events. Structural changes can show up in this variable as well. PEMM is used to calculate process efficiency(PEE) in the demand sector.

PEMM (ENDUSE,TECH,EC,YEAR)**: Process Technological Improvements** (($/Btu/$Btu) or ($/J/$/J))

PEMM, technological improvements in processes, is a calibrated variable reflecting non-price induced technological improvements which may reduce or improve process efficiency. Processes that become more energy intensive, often by substituting capital for labor, cause more energy to be used per dollar of output. PEMM can change over time and these changes should be evaluated and connected to "real world" events. Structural changes can show up in this variable as well. PEMM is used to calculate process efficiency(PEE) in the demand sector.

PEMX (ENDUSE,TECH,EC)**: Initial Capital Output Energy Efficiency Maximum Multiplier** (DLESS)

Initial ratio of maximum to average process efficiency. Source: estimated in Demand81. PEMX is used to calculate Process Capital Cost Coefficients(RPCTC) in the demand sector.

PEMX (ENDUSE,TECH,EC)**: Initial Capital Output Energy Efficiency Maximum Multiplier** (DLESS)

Initial ratio of maximum to average process efficiency. Source: estimated in Demand81. PEMX is used to calculate Process Capital Cost Coefficients(RPCTC) in the demand sector.

PEOC (RTCLASS,YEAR)**: Price Elect. Capital Costs** (MILLS/kWh)

Price electric capital costs are calculated by dividing the fixed costs allocated to a class by the sales in that class. It is the fixed cost component of price. It is calculated in the Price Procedure in the Electric Sector.

PEOC (RTCLASS,YEAR)**: Price Elect. Capital Costs** (MILLS/kWh)

Price electric capital costs are calculated by dividing the fixed costs allocated to a class by the sales in that class. It is the fixed cost component of price. It is calculated in the Price Procedure in the Electric Sector.

PEPL (ENDUSE,TECH,EC,YEAR)**: Physical Life of Process Requirements** (YRS)

Default national data in the *data files is from ARC80; more specific data is preferred. PEPL is used to determine the process requirements retirement rate(dividing the process requirements by the PEPL yields yearly retirements)

PEPL (ENDUSE,TECH,EC,YEAR)**: Physical Life of Process Requirements** (YRS)

Default national data in the *data files is from ARC80; more specific data is preferred. PEPL is used to determine the process requirements retirement rate(dividing the process requirements by the PEPL yields yearly retirements)

PEPLN (ENDUSE,TECH,EC,ZERO)**: Physical Life of Process Requirements** (YRS)

Default national data in the *data files is from ARC80; more specific data is preferred. PEPL is used to determine the process requirements retirement rate(dividing the process requirements by the PEPL yields yearly retirements)

PEPLN (ENDUSE,TECH,EC,ZERO)**: Physical Life of Process Requirements** (YRS)

Default national data in the *data files is from ARC80; more specific data is preferred. PEPL is used to determine the process requirements retirement rate(dividing the process requirements by the PEPL yields yearly retirements)

PER (ENDUSE,TECH,EC,YEAR)**: Process Energy Requirement** (mBtu/YR)

Process Energy Requirements(PER) are calculated from Process Energy Requirement Additions(PERA) and retirements(PERR) PERA is a function of production capacity, saturation and marginal process efficiency. Process Energy Requirement Retirements(PERR) has two components, production capacity retirements and process lifetime. It is used in a variety of calculations in the demand sector including DERA.

PER (ENDUSE,TECH,EC,YEAR)**: Process Energy Requirement** (mBtu/YR)

Process Energy Requirements(PER) are calculated from Process Energy Requirement Additions(PERA) and retirements(PERR) PERA is a function of production capacity, saturation and marginal process efficiency. Process Energy Requirement Retirements(PERR) has two components, production capacity retirements and process lifetime. It is used in a variety of calculations in the demand sector including DERA.

PER1 (CENDUSE,TECH,EC,YEAR)**: Process Energy Requirement** (mBtu/YR)

Process Energy Requirements(PER) are calculated from Process Energy Requirement Additions(PERA) and retirements(PERR) PERA is a function of production capacity, saturation and marginal process efficiency. Process Energy Requirement Retirements(PERR) has two components, production capacity retirements and process lifetime. It is used in a variety of calculations in the demand sector including DERA.

PER1 (CENDUSE,TECH,EC,YEAR)**: Process Energy Requirement** (mBtu/YR)

Process Energy Requirements(PER) are calculated from Process Energy Requirement Additions(PERA) and retirements(PERR) PERA is a function of production capacity, saturation and marginal process efficiency. Process Energy Requirement Retirements(PERR) has two components, production capacity retirements and process lifetime. It is used in a variety of calculations in the demand sector including DERA.

PERA (ENDUSE,TECH,EC,YEAR)**: Process Energy Requirements Additions** ((mBtu/YR)/YR)

Process Energy Requirement Additions(PERA) is a function of Marginal Process Efficiency(PEE), Production Capacity(EUPC), and saturation of devices(DST). It is calculated in the demand sector and is used to calculate the PER(process energy requirements).

PERA (ENDUSE,TECH,EC,YEAR)**: Process Energy Requirements Additions** ((mBtu/YR)/YR)

Process Energy Requirement Additions(PERA) is a function of Marginal Process Efficiency(PEE), Production Capacity(EUPC), and saturation of devices(DST). It is calculated in the demand sector and is used to calculate the PER(process energy requirements).

PESTD (ENDUSE,TECH,EC,YEAR)**: Process Efficiency Standard** ($/Btu or $/J)

The two process standards behave in the same manner as the device standards. PESTD reflects standards already in place and are included in the model's basecase data set. Standards on process are usually building shell efficiencies such as certain insulation requirements but theoretically there exists a process efficiency for each end use which can be manipulated with a standard. PESTDP is the policy variable used for testing different process efficiency standards in the future. Both act as floor levels on process efficiency in the demand sector - consumers can select greater efficiency levels but not lower ones.

PESTD (ENDUSE,TECH,EC,YEAR)**: Process Efficiency Standard** ($/Btu or $/J)

The two process standards behave in the same manner as the device standards. PESTD reflects standards already in place and are included in the model's basecase data set. Standards on process are usually building shell efficiencies such as certain insulation requirements but theoretically there exists a process efficiency for each end use which can be manipulated with a standard. PESTDP is the policy variable used for testing different process efficiency standards in the future. Both act as floor levels on process efficiency in the demand sector - consumers can select greater efficiency levels but not lower ones.

PESTDP (ENDUSE,TECH,EC,YEAR)**: Process Efficiency Standard Policy** ($/Btu or $/J)

The two process standards behave in the same manner as the device standards. PESTD reflects standards already in place and are included in the model's basecase data set. Standards on process are usually building shell efficiencies such as certain insulation requirements but theoretically there exists a process efficiency for each end use which can be manipulated with a standard. PESTDP is the policy variable used for testing different process efficiency standards in the future. Both act as floor levels on process efficiency in the demand sector - consumers can select greater efficiency levels but not lower ones.

PESTDP (ENDUSE,TECH,EC,YEAR)**: Process Efficiency Standard Policy** ($/Btu or $/J)

The two process standards behave in the same manner as the device standards. PESTD reflects standards already in place and are included in the model's basecase data set. Standards on process are usually building shell efficiencies such as certain insulation requirements but theoretically there exists a process efficiency for each end use which can be manipulated with a standard. PESTDP is the policy variable used for testing different process efficiency standards in the future. Both act as floor levels on process efficiency in the demand sector - consumers can select greater efficiency levels but not lower ones.

PETL (ENDUSE,TECH,EC)**: Tax Life of Process Requirements** (YRS)

Process Requirements tax life is a normal accounting value and is some fraction of physical life of capital. The input value resides in the data files and it is used in the calculation in the demand sector of PCCR(process requirements capital charge rate).

PETL (ENDUSE,TECH,EC)**: Tax Life of Process Requirements** (YRS)

Process Requirements tax life is a normal accounting value and is some fraction of physical life of capital. The input value resides in the data files and it is used in the calculation in the demand sector of PCCR(process requirements capital charge rate).

PEURETRO (ENDUSE)**: Process Retrofit Switch**

This switch activates the retrofit procedures in the demand sectors.

PEURETRO (ENDUSE)**: Process Retrofit Switch**

This switch activates the retrofit procedures in the demand sectors.

PFOMC (PLANT,YEAR)**: Pollution Control Fixed O&M Costs** ($/kWh)

An exogenously specified input used in the calculation of operation and maintenance costs (OMC).

PFOMC (PLANT,YEAR)**: Pollution Control Fixed O&M Costs** ($/kWh)

An exogenously specified input used in the calculation of operation and maintenance costs (OMC).

PFR (RTCLASS,YEAR)**: Peak Fraction Contribution** (DLESS)

Peak Fraction Contribution is the responsibility for peak demand by class. It is calculated by summing the peak demand across seasons relative to the system peak for that season and is then normalized. It is calculated in the Price procedure in the electric sector and is used to allocate fixed cost burdens by class.

PFR (RTCLASS,YEAR)**: Peak Fraction Contribution** (DLESS)

Peak Fraction Contribution is the responsibility for peak demand by class. It is calculated by summing the peak demand across seasons relative to the system peak for that season and is then normalized. It is calculated in the Price procedure in the electric sector and is used to allocate fixed cost burdens by class.

PFTC (ENDUSE,TECH,EC)**: Process Fuel Trade Off Coefficient**

Used to estimate the Process Efficiency Trade-off Curve. PFTC is derived from the Process Capital Trade Off Coefficient(PCTC). PCTC is calculated based on the marginal cost of fuel use(MCFU), the average process efficiency(PEEA), and annualized capital costs. The calculations are found in the initial files.

PFTC (ENDUSE,TECH,EC)**: Process Fuel Trade Off Coefficient**

Used to estimate the Process Efficiency Trade-off Curve. PFTC is derived from the Process Capital Trade Off Coefficient(PCTC). PCTC is calculated based on the marginal cost of fuel use(MCFU), the average process efficiency(PEEA), and annualized capital costs. The calculations are found in the initial files.

PIVTC (YEAR)**: Process Policy Investment Tax Credit** ($/$)

A user-specified input used to calculate the process capital charge rate in the CMARGINAL procedure in the demand sector. Values come from the policy or programs being simulated.

PIVTC (YEAR)**: Process Policy Investment Tax Credit** ($/$)

A user-specified input used to calculate the process capital charge rate in the CMARGINAL procedure in the demand sector. Values come from the policy or programs being simulated.

PJCI (PJ,YEAR)**: Capacity of Projects Initiated** (MW/YR)

This variable is used in one or more of the five procedures to determine new plant construction. The amount of capacity awarded to each project (PJCI) is based on the amount of power needed (IPGC) and the maximum (PJMAX) and minimum (PJMNPS) project sizes.

PJCI (PJ,YEAR)**: Capacity of Projects Initiated** (MW/YR)

This variable is used in one or more of the five procedures to determine new plant construction. The amount of capacity awarded to each project (PJCI) is based on the amount of power needed (IPGC) and the maximum (PJMAX) and minimum (PJMNPS) project sizes.

PJEC (PJ,YEAR)**: Project Environmental Costs** (MILLS/kWh)

This variable is used in one or more of the five procedures to determine new plant construction. Project enviromental cost per kWh is a function of the project type, project pollution, heat rate and the societal cost of pollution.

PJEC (PJ,YEAR)**: Project Environmental Costs** (MILLS/kWh)

This variable is used in one or more of the five procedures to determine new plant construction. Project environmental cost per kWh is a function of the project type, project pollution, heat rate and the societal cost of pollution.

PJECSW (YEAR)**: Project Environmental Costs Switch**

This is the switch to include project environmental costs in the marginal costs of the project calculation.   a value of zero excludes the costs and a value of one includes them. Zero is the default parameter.

PJECSW (YEAR)**:   Project Environmental Costs Switch**

This is the switch to include project environmental costs in the marginal costs of the project calculation.   a value of zero excludes the costs and a value of one includes them. Zero is the default parameter.

PJFP (PJ,YEAR)**:   Project Fuel Price** ($/mBtu)

This variable is used in one or more of the five procedures to determine new plant construction. Project fuel prices are assumed to be equal to fuel prices (FP).

PJFP (PJ,YEAR)**:   Project Fuel Price** ($/mBtu)

This variable is used in one or more of the five procedures to determine new plant construction. Project fuel prices are assumed to be equal to fuel prices (FP).

PJHRT (PJ)**:   Project Heat Rate** (Btu/kWh)

This variable is used in one or more of the five procedures to determine new plant construction. This is an exogenously specifed variable currently set at the same value as HRTM.

PJHRT (PJ)**:   Project Heat Rate** (Btu/kWh)

This variable is used in one or more of the five procedures to determine new plant construction. This is an exogenously specified variable currently set at the same value as HRTM.

PJMAW (PJ)**:   Project Allocation Weight** $/$

The project allocation weight is based on the marginal cost of energy modified by non-proce factors and a variance factor to capture imperfect price information.

PJMAW (PJ)**:   Project Allocation Weight** $/$

he project allocation weight is based on the marginal cost of energy modified by non-price factors and a variance factor to capture imperfect price information.

PJMAX (PJ)**:   Maximum Project Size** (MW)

This variable is used in one or more of the five procedures to determine new plant construction. It is used in the calculation of PJCI and is an exogenously specified variable.

PJMAX (PJ)**:   Maximum Project Size** (MW)

This variable is used in one or more of the five procedures to determine new plant construction. It is used in the calculation of PJCI and is an exogenously specified variable.

PJMNPS (PJ)**: Minimum Project Size** (MW)

This variable is used in one or more of the five procedures to determine new plant construction. It is used in the calculation of PJCI and is an exogenously specified variable. It should correspond the minimum plant size for each type of construction. If it has a value of zero for a particular plant type, then that type is not used.

PJMNPS (PJ)**: Minimum Project Size** (MW)

This variable is used in one or more of the five procedures to determine new plant construction. It is used in the calculation of PJCI and is an exogenously specified variable. It should correspond the minimum plant size for each type of construction. If it has a value of zero for a particular plant type, then that type is not used.

PJMS (PJ,YEAR)**: Project Market Share of Capacity Needs** (MW/MW)

This variable is used in one or more of the five procedures to determine new plant construction.

PJMS (PJ,YEAR)**: Project Market Share of Capacity Needs** (MW/MW)

This variable is used in one or more of the five procedures to determine new plant construction.

PJMSM (PJ,YEAR)**: Project Market Share Non Price Factors** (Dless)

This variable is used in one or more of the five procedures to determine new plant construction. The project Market Share Non Price Factors are an exogenously specified variable used in the determination of the project allocation weights that determine the type of plants that are constructed. Generally, one plant type (preferred) is assigned a value of one and the rest are weighted relative to this point. The lowest value is zero; these plant types are not considered.

PJMSM (PJ,YEAR)**: Project Market Share Non Price Factors** (Dless)

This variable is used in one or more of the five procedures to determine new plant construction. The project Market Share Non Price Factors are an exogenously specified variable used in the determination of the project allocation weights that determine the type of plants that are constructed. Generally, one plant type (preferred) is assigned a value of one and the rest are weighted relative to theis point. The lowest value is zero; these plant types are not considered.

PJPCX (PJ,POLL,YEAR)**: Project Pollution Coefficients** (TONS/tBtu)

This variable is used in one or more of the five procedures to determine new plant construction. These are exogenously specified inputs used in the determination of the project environmental costs (externalities). Currently the values are set equal to POCX.

PJPCX (PJ,POLL,YEAR)**: Project Pollution Coefficients** (TONS/tBtu)

This variable is used in one or more of the five procedures to determine new plant construction. These are exogenously specified inputs used in the determination of the project environmental costs (externalities). Currently the values are set equal to POCX.

PJPL (PJ)**: Project Physical Lifetime** (YEARS)

This variable is used in one or more of the five procedures to determine new plant construction. This is an exogenously specified input Currently is has the same value as GCPL.

PJPL (PJ)**: Project Physical Lifetime** (YEARS)

This variable is used in one or more of the five procedures to determine new plant construction. This is an exogenously specified input Currently is has the same value as GCPL.

PJPLANT (PLANT)**: Map between PJ and PLANT**

This variable is used in one or more of the five procedures to determine new plant construction. This variable maps projects to plant types.

PJPLANT (PLANT)**: Map between PJ and PLANT**

This variable is used in one or more of the five procedures to determine new plant construction. This variable maps projects to plant types.

PJPOWER (PJ)**: Project Power Type** (1=Peak, 2=Baseload)

This variable is used in one or more of the five procedures to determine new plant construction. This variable maps plants to power type - either peaking or baseload.

PJPOWER (PJ)**: Project Power Type** (1=Peak, 2=Baseload)

This variable is used in one or more of the five procedures to determine new plant construction. This variable maps plants to power type - either peaking or baseload.

PJSW (YEAR)**: Project Selection Method Switch, 1-Supply Curve, 5-GCFRINITIATION**

This variable is used in one or more of the five procedures to determine new plant construction. This switch determines the building methodology used in the model. The methodologies include: (1) rank order - projects selected on the basis of busbar costs; (2) market share - projects selected using consumer choice theory; (3) future market share - projects selected based on future desired market share; (4) supply curve - projects are selected from a generation supply curve defined in EDATA; (5) gcrinnitiation - projects are selected based on the generation capacity fraction initiation.

PJSW (YEAR)**: Project Selection Method Switch, 1-Supply Curve, 5-GCFRINITIATION**

This variable is used in one or more of the five procedures to determine new plant construction. This switch determines the building methodology used in the model. The methodologies include: (1) rank order - projects selected on the basis of busbar costs; (2) market share - projects selected using consumer choice theory; (3) future market share - projects selected based on future desired market share; (4) supply curve - projects are selected from a generation supply curve defined in EDATA; (5) gcinnitiation - projects are selected based on the generation capacity fraction initiation.

PJTECH (PJ)**: Map between TECH and PJ**

This variable is used in one or more of the five procedures to determine new plant construction. This variable maps the construction project to technology.

PJTECH (PJ)**: Map between TECH and PJ**

This variable is used in one or more of the five procedures to determine new plant construction. This variable maps the construction project to technology.

PJVF : Project Variance Factor

This variable is used in one or more of the five procedures to determine new plant construction. PJVF is an exogenously specified variable used to capture the difference between actual and perceived prices. It is used in the calculation of the project allocation weight.

PJVF : Project Variance Factor

This variable is used in one or more of the five procedures to determine new plant construction. PJVF is an exogenously specified variable used to capture the difference between actual and perceived prices. It is used in the calculation of the project allocation weight.

PKBASE Peak load used as Baseload**:**

PKBASE is the MW of peak capacity allowed to serve base loads if necessary. It is an exogenously specified variable.

PKBASE :

PKBASE is the MW of peak capacity allowed to serve base loads if necessary. It is an exogenously specified variable.

PKLOAD (MONTH,YEAR)**:** **Monthly Peak Load** mW/month

Calculated in the demand procedures and residing in SOUTPUT, this variable exogenous to the electric sector. It is used in the calculation of the peak demand for power (PDPM)

PKLOAD (MONTH,YEAR)**:** **Monthly Peak Load** mW/month

Calculated in the demand procedures and residing in SOUTPUT, this variable exogenous to the electric sector. It is used in the calculation of the peak demand for power (PDPM)

PLNTYPE (PLANT)**:** **Plant Dispatch Type** (2=BASE,1=PEAK)

This variable maps projects to dispatch type. Plants are dispatched either as baseload or peakers.

PLNTYPE (PLANT)**:** **Plant Dispatch Type** (2=BASE,1=PEAK)

This variable maps projects to dispatch type. Plants are dispatched either as baseload or peakers.

POCA (FUEL,POLL,YEAR)**:** **Average Pollution Coefficients** (TONS/tBtu)

The average pollution in tons per tBtu is a function of the embodied pollution and the maximum fuel demand.

POCA (TECH,EC POLL,YEAR)**:** **Average Pollution Coefficients** (TONS/tBtu or TONNES/PJ)

Calculated in the Pollution procedure in the demand sector, POCA is the ratio of embedded pollution to the device energy requirement.

POCA (TECH,EC POLL,YEAR)**:** **Average Pollution Coefficients** (TONS/tBtu or TONNES/PJ)

Calculated in the Pollution procedure in the demand sector, POCA is the ratio of embedded pollution to the device energy requirement.

POCA (FUEL,POLL,YEAR)**:** **Average Pollution Coefficients** (TONS/tBtu)

The average pollution in tons per tBtu is a function of the embodied pollution and the maximum fuel demand.

POCALG (FUEL,POLL,YEAR)**:** **Average Pollution Coefficients** TONS/PJ

POCF (ENDUSE,TECH,EC)**:** **Process Operating Cost Fraction** (($/YR)/$)

A calibrated variable capturing the costs of operating and maintaining process capital by the customer. POCF is an added cost term in the market share process.

POCF (ENDUSE,TECH,EC)**: Process Operating Cost Fraction** (($/YR)/$)

A calibrated variable capturing the costs of operating and maintaining process capital by the customer. POCF is an added cost term in the market share process.

POCR (FUEL,POLL,YEAR)**: Retirement Pollution Coefficients** (TONS/tBtu)

An exogenously specified input variable used in the calculation of pollution retirements.

POCR (FUEL,POLL,YEAR)**: Retirement Pollution Coefficients** (TONS/tBtu)

An exogenously specified input variable used in the calculation of pollution retirements.

POCS (TECH,EC POLL,YEAR)**: Pollution Standards**

A policy variable, with values derived from the policy or programs being tested, pollution standards act as a ceiling, curtailing certain types of fuel use.

POCS (TECH,EC POLL,YEAR)**: Pollution Standards**

A policy variable, with values derived from the policy or programs being tested, pollution standards act as a ceiling, curtailing certain types of fuel use.

POCS (FUEL,POLL,YEAR)**: Pollution Standards** (TONS/tBtu)

An exogenously specified policy variable used to calculate pollution additions (POEMA)

POCS (FUEL,POLL,YEAR)**: Pollution Standards** (TONS/tBtu)

An exogenously specified policy variable used to calculate pollution additions (POEMA)

POCST (FUEL,YEAR)**: Societal Cost of Pollution** $M/TON

Pollution costs are the summed across pollutants to yield cost of pollution by fuel.

POCST (FUEL,YEAR)**: Societal Cost of Pollution** $M/TON

Pollution costs are the summed across pollutants to yield cost of pollution by fuel.

POCST (ES,FUEL,YEAR)**: Societal Cost of Pollution** ($M/YR)

Calculated in the Pollution procedure in the demand sector, POCST is the product of total pollution(TFPOL) and the societal cost of pollution per unit (POCSTR).

POCST (ES,FUEL,YEAR)**: Societal Cost of Pollution** ($M/YR)

Calculated in the Pollution procedure in the demand sector, POCST is the product of total pollution(TFPOL) and the societal cost of pollution per unit (POCSTR).

POCSTR (POLL,YEAR)**: Societal Cost of Pollution** (($/TON) or ($/TON)NE)

A user specified input used in the calculation of the total societal cost of pollution(POCST).

POCSTR (POLL,YEAR)**: Societal Cost of Pollution** (($/TON) or ($/TON)NE)

A user specified input used in the calculation of the total societal cost of pollution(POCST).

POCSTR (POLL,YEAR)**: Societal Cost of Pollution** ($/TON)

An exogenously specified cost based on control or damage costs used to compute a yearly cost of pollution.

POCSTR (POLL,YEAR)**: Societal Cost of Pollution** ($/TON)

An exogenously specifed cost based on control or damage costs used to compute a yearly cost of pollution.

POCT (FUEL,POLL,YEAR)**: Pollution Control Capital Costs** (($/TON)/YR)

An exogenously specified input variable.

POCT (FUEL,POLL,YEAR)**: Pollution Control Capital Costs** (($/TON)/YR)

An exogenously specified input variable.

POCX (FUEL,POLL,YEAR)**: Marginal Pollution Coefficients** (TONS/tBtu)

An exogenously specified input variable used to calculate pollution additions (POEMA).

POCX (TECH,EC POLL,YEAR)**: Marginal Pollution Coefficients** (TONS/tBtu or TONNES/PJ)

The default data comes from "Emission Factors for Greenhouse and Other Gases by Fuel Type: An Inventory.: Energy, Mines, and Resources, December 1990. Other data sources are also used - see the *data files. POCX is used in the calculation of new devices in the demand sector.

POCX (TECH,EC POLL,YEAR)**: Marginal Pollution Coefficients** (TONS/tBtu or TONNES/PJ)

The default data comes from "Emission Factors for Greenhouse and Other Gases by Fuel Type: An Inventory.: Energy, Mines, and Resources, December 1990. Other data sources are also used - see the *data files. POCX is used in the calculation of new devices in the demand sector.

POCX (FUEL,POLL,YEAR)**: Marginal Pollution Coefficients** (TONS/tBtu)

An exogenously specified input variable used to calculate pollution additions (POEMA).

POEM (FUEL,POLL,YEAR)**: Embodied Pollution** (TONS/YR)

The embedded pollution is a function of the embodied pollution (POEMLG) plus the net pollution additions.

POEM (TECH,EC POLL,YEAR)**: Embodied Pollution**

Embedded Pollution(POEM) is current embodied pollution plus and additions from new devices(POEMA) and minus any reduction in pollution from device retirements.

POEM (FUEL,POLL,YEAR)**: Embodied Pollution** (TONS/YR)

The embedded pollution is a function of the embodied pollution (POEMLG) plus the net pollution additions.

POEM (TECH,EC POLL,YEAR)**: Embodied Pollution**

Embedded Pollution(POEM) is current embodied pollution plus and additions from new devices(POEMA) and minus any reduction in pollution from device retirements.

POEMA (FUEL,POLL,YEAR)**: Pollution Additions** (TONS/YR)

The pollution additions are equal to the electric utility demand additions multiplied by the minimum of either the marginal pollution coefficients or the pollution standards.

POEMA (FUEL,POLL,YEAR)**: Pollution Additions** (TONS/YR)

The pollution additions are equal to the electric utility demand additions multiplied by the minimum of either the marginal pollution coeefficients or the pollution standards.

POEMLG (FUEL,POLL,YEAR)**: Embodied Pollution** (TONS/YEAR)

An exogenously specified input used in the calculation of embedded pollution (POEM).

POEMLG (FUEL,POLL,YEAR)**: Embodied Pollution** (TONS/YEAR)

An exogenously specified input used in the calculation of embedded pollution (POEM).

POEMR (FUEL,POLL,YEAR)**:** **Pollution Retirement** (TONS/YR)

The pollution retirements are equal to the electric utility fuel demand retirements multiplied by the retirement pollution coefficient.

POEMR (FUEL,POLL,YEAR)**:** **Pollution Retirement** (TONS/YR)

The pollution retirements are equal to the electric utility fuel demand retirements multiplied by the retirement pollution coefficient.

POEMRR (FUEL,POLL,YEAR)**:** **Pollution Retrofits** (TONS/YEAR)

A policy variable used to modify embedded pollution (POEM).

POEMRR (FUEL,POLL,YEAR)**:** **Pollution Retrofits** (TONS/YEAR)

A policy variable used to modify embedded pollution (POEM).

POP (ECC,YEAR)**:** **Population** (MILLIONS)

Census data defined in the mdata file and used in the calculation of market allocation weights that determine market share fractions in the demand sector.

POP (ECC,YEAR)**:** **Population** (MILLIONS)

Census data defined in the mdata file and used in the calculation of market allocation weights that determine market share fractions in the demand sector.

POP0 (ECC,FIRST)**:** **Population** (MILLIONS)

Census data defined in the mdata file and used in the calculation of market allocation weights that determine market share fractions in the demand sector.

POP0 (ECC,FIRST)**:** **Population** (MILLIONS)

Census data defined in the mdata file and used in the calculation of market allocation weights that determine market share fractions in the demand sector.

POSTD (FUEL,POLL,YEAR)**:** **Pollution Standards** (TON/YEAR)

A policy variable used to test pollution control strategies.

POSTD (FUEL,POLL,YEAR)**:** **Pollution Standards** (TON/YEAR)

A policy variable used to test pollution control strategies.

PP : Purchased Power

Purchased power by plant is the sum over seasons of the purchase power effective generation by plant and season.

PP : Purchased Power

Purchased power by plant is the sum over seasons of the purchase power effective generation by plant and season.

PPAF (PP,MONTH,YEAR)**: Firm Purchases Availability Factor** (Fraction)

An exogenously specified fraction used to modify the firm purchases generating capacity.

PPAF (PP,MONTH,YEAR)**: Firm Purchases Availability Factor** (Fraction)

An exogenously specified fraction used to modify the firm purchases generating capacity.

PPCC (PP,YEAR)**: Firm Purchases Capacity Charges** ($/MW)

An exogenously specified variable used in the calculation of purchase power costs (PPCT).

PPCC (PP,YEAR)**: Firm Purchases Capacity Charges** ($/MW)

An exogenously specified variable used in the calcuation of purchase power costs (PPCT).

PPCT (PP,YEAR)**: Firm Purchases Cost** (M$)

The purchased power costs are equal to the fixed (capacity charge) plus the variable costs. The variable costs are equal to the amount purchased multiplied by the unit cost. The capacity cost is equal to the amount of capacity multiplied by the appropriate capaicty charge rate.

PPCT (PP,YEAR)**: Firm Purchases Cost** (M$)

The purchased power costs are equal to the fixed (capacity charge) plus the variable costs. The variable costs are equal to the amount purchased multiplied by the unit cost. The capacity cost is equal to the amount of capacity multiplied by the appropriate capacity charge rate.

PPDMD (PP,YEAR)**: Purchase Power Fuel Demand** ((tBtu/YEAR))

The fuel demanded for purchased power is a function of the electricity purchased and the heat rate.

PPDMD (PP,YEAR)**: Purchase Power Fuel Demand** (tBtu/YEAR)

The fuel demanded for purchased power is a function of the electricity purchased and the heat rate.

PPEG (PP,YEAR)**: Purchase Power Purchases** (GWH)

Total firm purchases are calculated as the sum over month of electricity generated from purchased power (EGP).

PPEG (PP,YEAR)**: Purchase Power Purchases** (gWh)

Total firm purchases are calculated as the sum over month of electricity generated from purchased power (EGP).

PPFR (PLANT,YEAR)**: Purchased Power Fraction Available**

Purchased power capacity is exogenous to the model and is defined as a fraction of average utility demand. PPFR is the exogenously specified fraction.

PPFR (PLANT,YEAR)**: Purchased Power Fraction Available**

Purchased power capacity is exogenous to the model and is defined as a fraction of average utility demand. PPFR is the exogenously specified fraction.

PPGC (PP,YEAR)**: Firm Purchases Capacity** (MW)

Firm purchase capacity is equal to the sum of exogenous firm purchase contracts plus new purchase power needed because of a capacity shortfall. Used in the calculation of future miscellaneous generation capacity (FMGC).

PPGC (PP,YEAR)**: Firm Purchases Capacity** (MW)

Firm purchase capacity is equal to the sum of exogenous firm purchase contracts plus new purchase power needed because of a capacity shortfall. Used in the calculation of future miscellaneous generation capacity (FMGC).

PPGCA (PP,YEAR)**: PP Generation Capacity Additions** (MW)

The retirements of IPP capacity are equal to the current IPP capacity minus the IPP capacity in the previous period (if the subtraction yields a positive number).

PPGCA (PP,YEAR)**: PP Generation Capacity Additions** (MW)

The retirements of IPP capacity are equal to the current IPP capacity minus the IPP capacity in the previous period (if the subtraction yields a positive number).

PPGCEN (PP,YEAR)**: Endogenous Purchase Power Contracts** (MW)

If power is needed and was unanticipated by the forecasting procedure, purchased power is used to fill the gap. Endogenous purchase power contracts and capacity are calculated wherever the plant construction time (CTIME) is greater than the lag in demand - new demand is not left unserved. Historical purchased power, if it exists, cannot be used to fill the gaps.

PPGCEN (PP,YEAR)**:   Endogenous Purchase Power Contracts** MW

If power is needed and was unanticipated by the forecasting procedure, purchased power is used to fill the gap. Endogenous purchase power contracts and capacity are calculated wherever the plant construction time (CTIME) is greater than the lag in demand - new demand is not left unserved. Historical purchased power, if it exists, cannot bu used to fill the gaps.

PPGCR (PP,YEAR)**:   PP Generation Capacity Retirements** (MW)

The retirements of IPP capacity are equal to the current IPP capacity minus the IPP capacity in the previous period (if the subtraction yields a negative number).

PPGCR (PP,YEAR)**:   PP Generation Capacity Retirements** (MW)

The retirements of IPP capacity are equal to the current IPP capacity minus the IPP capacity in the previous period (if the subtraction yields a negative number).

PPIVTC (YEAR)**:   Process Policy Investment Tax Credit** ($/$)

This input taken from the policy to be simulated, is used in calculating the policy process capital charge rate. The capital charge rate(PCCR) is computed based on the policy investment tax credits(PPIVTC) and interest rate on subsidized loans(CROIN).

PPIVTC (YEAR)**:   Process Policy Investment Tax Credit** ($/$)

This input taken from the policy to be simulated, is used in calculating the policy process capital charge rate. The capital charge rate(PCCR) is computed based on the policy investment tax credits(PPIVTC) and interest rate on subsidized loans(CROIN).

PPMAP (PP)**:   Purchase Power Map between PP and Dispatch Sets**

PPMAP maps purchased power generation to dispatch type.

PPMAP (PP)**:   Purchase Power Map between PP and Dispatch Sets**

PPMAP maps purchased power generation to dispatch type.

PPPLMAP (PP,PLANT)**:   Purchase Power Map between PP and PLANT sets**

PPPLMAP maps purchased power generation to plant types.

PPPLMAP (PP,PLANT)**: Purchase Power Map between PP and PLANT sets**

PPPLMAP maps purchased power generation to plant types.

PPTBF (PP,YEAR)**: Firm Purchases T&D Costs to be Financed** ($M)

An exogenously specified variable used in the calculation of construction work into gross assets (CWGAA).

PPTBF (PP,YEAR)**: Firm Purchases T&D Costs to be Financed** ($M)

An exogenously specified variable used in the calculation of construction work into gross assets (CWGAA).

PPUC (PP,YEAR)**: Purchase Power Unit Cost** (Mills/kWh)

The unit cost of purchased power is endogenously estimated as an energy cost plus wheeling charges.

PPUC (PP,YEAR)**: Purchase Power Unit Cost** (Mills/kWh)

The unit cost of purchased power is endogenously estimated as an energy cost plus wheeling charges.

PPWC (PP,YEAR)**: Purchase Power Wheeling Charge** (MILLS/kWh)

The purchase power wheeling charge is defined historically in EDATA as the difference bewtween the utility cost of fuel (XEUFP) and what the utility actually pays for the purchased opwer (XPPUC). Future values are set equal to the last historical value.

PPWC (PP,YEAR)**: Purchase Power Wheeling Charge** (MILLS/kWh)

The purchase power wheeling charge is defined historically in EDATA as the difference between the utility cost of fuel (XEUFP) and what the utility actually pays for the purchased power (XPPUC). Future values are set equal to the last historical value.

PRPLMAP (PLANT,PRICES)**: Map between PLANT and PRICES**

PPMAP maps plant types to fuel prices.

PRPLMAP (PLANT,PRICES)**: Map between PLANT and PRICES**

PPMAP maps plant types to fuel prices.

PS (YEAR)**: Preferred Stock** (M$)

Preferred stock increased with new sales (PSFD) and declines through the use of a sinking fund (PSSF).

PS (YEAR)**:** **Preferred Stock** (M$)

Preferred stock increased with new sales (PSFD) and declines through the use of a sinking fund (PSSF).

PSAL (YEAR)**:** **Preferred Stock Average Lifetime** (YEARS)

An exogenously specified variable used in calculating the preferred stock sinking fund. It is calculated in EDATA by dividing the previous year's preferred stock issued by the preferred stock sinking fund. A utility annual report may also contain information to calculate this value.

PSAL (YEAR)**:** **Preferred Stock Average Lifetime** (YEARS)

An exogenously specified variable used in calculating the preferred stock sinking fund. It is calculated in EDATA by dividing the previous year's preferred stock issued by the preferred stock sinking fund. A utility annual report may also contain information to calculate this value.

PSDBR (YEAR)**:** **Preferred Stock to Debt Ratio** ($/$)

A calibrated variable used in the limiting procedure on preferred stock.

PSDBR (YEAR)**:** **Preferred Stock to Debt Ratio** ($/$)

A calibrated variable used in the limiting procedure on preferred stock.

PSDV (YEAR)**:** **Preferred Stock Dividends** (M$/YR)

Like long term debt interest payments, preferred stock dividends represent commitments to payments with specified rates and schedules. Preferred stocks pay dividends which reflect, for all practical purposes, an interest rate. PSDV increases with new dividend rates and are reduced by the dividend requirements associated with the sinking fund.

PSDV (YEAR)**:** **Preferred Stock Dividends** (M$/YR)

Like long term debt interest payments, preferred stock dividends represent commitments to payments with specified rates and schedules. Preferred stocks pay dividends which reflect, for all practical purposes, an interest rate. PSDV increases with new dividend rates and are reduced by the dividend requirements associated with the sinking fund.

PSDVR (YEAR)**:** **Preferred Stock Dividend Rate** (1/YR)

Preferred stocks pay dividends which reflect, for all practical purposes, an interest rate. This rate (PSDVR) is calculated like any other interest rate as the smoothed inflation rate (INSM) plus a real cost (PSPR).

PSDVR (YEAR)**: Preferred Stock Dividend Rate** (1/YR)

Preferred stocks pay dividends which reflect, for all practical purposes, an interest rate. This rate (PSDVR) is calculated like any other interest rate as the smoothed inflation rate (INSM) plus a real cost (PSPR).

PSEF (YEAR)**: Power Storage Efficiency** (kWh/kWh)

This fraction modifies pumped storage load to account for energy losses associated with filling the PS reservoir. It is used in the determination of ADPM and MDPM.

PSEF (YEAR)**: Power Storage Efficiency** (kWh/kWh)

This fraction modifies pumped storage load to account for energy losses associated with filling the PS reservoir. It is used in the determination of ADPM and MDPM.

PSFD (YEAR)**: Funds from Preferred Stock** (M$/YR)

If additional funds are needed preferred stock can be issued after short term investments are liquified and long term debt funding is obtained. Preferred stock is limited by a desired ratio with long-term debt.

PSFD (YEAR)**: Funds from Preferred Stock** (M$/YR)

If additional funds are needed preferred stock can be issued after short term investments are liquefied and long term debt funding is obtained. Preferred stock is limited by a desired ratio with long-term debt.

PSGC (YEAR)**: Pumped Storage Capacity** (MW)

An exogenously specified input variable that when modified by its availability factor is counted in a utility's effective generating capacity.

PSGC (YEAR)**: Pumped Storage Capacity** (MW)

An exogenously specified input variable that when modified by its availability factor is counted in a utility's effective generating capacity.

PSMINF : Pumped Storage Change in Minimum Demand Fraction

This exogenously specified multiplier is used to increase the MDPM to correspond to the extra base generation needed to fill the reservoir when pumped storage is not being used.

PSMINF : Pumped Storage Change in Minimum Demand Fraction

This exogenously specified multiplier is used to increase the MDPM to correspond to the extra base generation needed to fill the reservoir when pumped storage is not being used.

PSPAF (MONTH)**: Pumped Storage Availability Factor**

An exogenously specified input variable that is used to modify pumped storage generating capacity before it is counted in a utility's effective generating capacity.

PSPAF (MONTH)**: Pumped Storage Availability Factor**

An exogenously specified input variable that is used to modify pumped storage generating capacity before it is counted in a utility's effective generating capacity.

PSPR (YEAR)**: Preferred Stock Risk Premium** (1/YR)

This exogenously specified input variable represents the real return on preferred stock. It is calculated in EDATA by dividing the value of preferred stock into the preferred stock dividends and subtracting the smoothed inflation rate from the result. Along with the smoothed inflation rate, it is used to calculate the preferred stock dividend rate.

PSPR (YEAR)**: Preferred Stock Risk Premium** (1/YR)

This exogenously specified input variable represents the real return on preferred stock. It is calculated in EDATA by dividing the value of preferred stock into the preferred stock dividends and subtracting the smoothed inflation rate from the result. Along with the smoothed inflation rate, it is used to calculate the preferred stock dividend rate.

PSSF (YEAR)**: Preferred Stock Sinking Fund** (M$/YR)

The preferred stock sinking fund is calculated by dividing the preferred stock (PS) by the average life of preferred stock (PSAL)

PSSF (YEAR)**: Preferred Stock Sinking Fund** (M$/YR)

The preferred stock sinking fund is calculated by dividing the preferred stock (PS) by the average life of preferred stock (PSAL)

PSTD (FUEL,POLL)**: Pollution Standards** tons

The pollution standards are functions of the base energy demand (PBASE) and the pollution standards (POCS in tons/tBtu)

PSTD (FUEL,POLL)**: Pollution Standards** tons

The pollution standards are functions of the base energy demand (PBASE) and the pollution standards (POCS in tons/tBtu)

PSUSE (YEAR)**: Power Storage Usage Rate** (Frac.)

An exogenously specified input variable that is used to modify pumped storage effective generating capacity in the calculation of the pumped storage electricity dispatched.

PSUSE (YEAR)**: Power Storage Usage Rate** (Frac.)

An exogenously specified input variable that is used to modify pumped storage effective generating capacity in the calculation of the pumped storage electricity dispatched.

PTAX (YEAR)**: Property and Revenue Tax** (M$/YR)

Property and state taxes are calculated as the product of the tax rate times net assets. A revenue tax may also be tested as a policy.

PTAX (YEAR)**: Property and Revenue Tax** (M$/YR)

Property and state taxes are calculated as the product of the tax rate times net assets. A revenue tax may also be tested as a policy.

PTAXR (AA,YEAR)**: Property Tax Rate** (1/YR)

An exogenously specified variable (also a policy variable) that is used to calculate property tax obligations. Calculated in EDATA from historical values, PTAXR is defined as historical property taxes paid divided by historical net assets. Future values are set equal to the last historical value.

PTAXR (AA,YEAR)**: Property Tax Rate** (1/YR)

An exogenously specified variable (also a policy variable) that is used to calculate property tax obligations. Calculated in EDATA from historical values, PTAXR is defined as historical property taxes paide divided by historical net assets. Future values are set equal to the last historical value.

PUCT (YEAR)**: Cost of Purchase Power** (M$/YR)

The cost of purchased power is the sum of purchases in gWh, firm power, and qualified facility usage multiplied by unit power costs.

PUCT (YEAR)**: Cost of Purchase Power** (M$/YR)

The cost of purchased power is the sum of purchases in GWH, firm power, and qualified facility usage multiplied by unit power costs.

PULSE (AA)**: Pulse to Move Assets Across Age Classes**

The pulse parameter moves utility assets across the age categories from new construction until retirements.

PULSE (AA)**: Pulse to Move Assets Across Age Classes**

The pulse parameter moves utility assets across the age categories from new construction until retirements.

PUOMC (PLANT,YEAR)**: Real Pollution Control Unit O&M Costs** (Mills/kWh)

An exogenously specified input used in the calculation of operation and maintenance costs (OMC).

PUOMC (PLANT,YEAR)**: Real Pollution Control Unit O&M Costs** (Mills/Kwh)

An exogenously specified input used in the calculation of operation and maintenance costs (OMC).

QFCC (TECH,YEAR)**: Qualified Facility Capacity Charges** ($/MW)

An exogenously specified variable used in the calculation of qualifying facility electricity prices.

QFCC (TECH,YEAR)**: Qualified Facility Capacity Charges** ($/MW)

An exogenously specified variable used in the calculation of qualifying facility electricity prices.

QFCT (TECH,YEAR)**: Qualified Facilities Cost** (M$)

The QF power costs are equal to the fixed (capacity charge) plus the variable costs. The variable costs are equal to the amount purchased multiplied by the unit cost. The capacity cost is equal to the amount of capacity multiplied by the appropriate capacity charge rate.

QFCT (TECH,YEAR)**: Qualified Facilities Cost** (M$)

The QF power costs are equal to the fixed (capacity charge) plus the variable costs. The variable costs are equal to the amount purchased multiplied by the unit cost. The capacity cost is equal to the amount of capacity multiplied by the appropriate capaicty charge rate.

QFDMD (TECH,YEAR)**: Fuel Demand from Qualifying Facilities** ((tBtu/YEAR))

Qualified facility fuel demand is a function of the electricity generated by the QFs and the QF heat rate.

QFDMD (TECH,YEAR)**: Fuel Demand from Qualifying Facilities** ((tBtu/YEAR))

Qualified facility fuel demand is a function of the electricity generated by the QFs and the QF heat rate.

QFEG (TECH,YEAR)**: QF Electricity Generated** (GWH/YR)

Qualifing Facility Electricity Generated each year is simply the sum over season of the QF generation by plant.

QFEG (TECH,YEAR)**: QF Electricity Generated** (gWh/YR)

Qualifying Facility Electricity Generated each year is simply the sum over season of the QF generation by plant.

QFGCA (TECH,YEAR)**: QF Generation Capacity Additions** (MW)

The additions to IPP capacity are equal to the current IPP capacity minus the IPP capacity in the previous period.

QFGCA (TECH,YEAR)**: QF Generation Capacity Additions** (MW)

The additions to IPP capacity are equal to the current IPP capacity minus the IPP capacity in the previous period.

QFGCR (TECH,YEAR)**: QF Generation Capacity Retirements** ((MW))

The retirements of IPP capacity are equal to the current IPP capacity minus the IPP capacity in the previous period (if the subtraction yields a negative number).

QFGCR (TECH,YEAR)**: QF Generation Capacity Retirements** (MW)

The retirements of IPP capacity are equal to the current IPP capacity minus the IPP capacity in the previous period (if the subtraction yields a negative number).

QFHRT (TECH)**: Small Power Producers Heat Rate**

An exogenously specified input used in the calculation of QF fuel demand (QFDMD).

QFHRT (TECH)**: Small Power Producers Heat Rate**

An exogenously specified input used in the calculation of QF fuel demand (QFDMD).

QFUC (TECH,YEAR)**: QF Purchases Unit Cost** (MILLS/kWh)

QF purchase power unit cost is calculated historically as the total cost of energy (XQFCT) divided by the total energy purchased (XQFEG). Future values are equal to the last historical value.

QFUC (TECH,YEAR)**: QF Purchases Unit Cost** MILLS/kWh

QF purchase power unit cost is calculated historically as the total cost of energy (XQFCT) divided by the total energy purchased (XQFEG). Future values are equal to the last historical value.

RB (YEAR)**: Forecast Rate Base** (M$)

Rate base equals net plant-in-service, plus any plants coming on-line during the test year, plus working capital, plus any CWIP and AFC allowed in the rate-base (less adjustments for plants coming on-line during the test year). Deferred taxes and tax credits are also netted out of the rate base.

RB (YEAR)**: Forecast Rate Base** (M$)

Rate base equals net plant-in-service, plus any plants coming on-line during the test year, plus working capital, plus any CWIP and AFC allowed in the rate-base (less adjustments for plants coming on-line during the test year). Deferred taxes and tax credits are also netted out of the rate base.

RBOPINC (YEAR)**: Operating Income from Forecast Rate Base** (M$)

Rate-base operating income is the rate-base (RB) multiplied by the weighted cost of capital (WCC).

RBOPINC (YEAR)**: Operating Income from Forecast Rate Base** (M$)

Rate-base operating income is the rate-base (RB) multiplied by the weighted cost of capital (WCC).

RDCCU (ENDUSE,TECH,YEAR)**: Device Retrofit Rebate**

The RDCCU is a policy input variable that varies with the retrofit policy being tested. By definition the subsidy cannot exceed the cost of the device. It is used to alter the device capital cost(DCC) and thereby change the level of efficiency(DEE) selected by consumers and, in the case of retrofits, induce consumers to purchase new equipment before the old equipment lifetime expires.

RDCCU (ENDUSE,TECH,YEAR)**: Device Retrofit Rebate**

The RDCCU is a policy input variable that varies with the retrofit policy being tested. By definition the subsidy cannot exceed the cost of the device. It is used to alter the device capital cost(DCC) and thereby change the level of efficiency(DEE) selected by consumers and, in the case of retrofits, induce consumers to purchase new equipment before the old equipment lifetime expires.

RDMSM0 (ENDUSE,TECH,CTECH,EC,YEAR)**: Device Retrofit Market Share Multiplier** (1/YR)

The non-price factors(RDMSM0) in the device retrofit decision making process is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. RDMSM0 is used to modify the retrofit device market allocation weight which is used to determine the market share for each fuel in the device retrofit procedure in the demand sector.

RDMSM0 (ENDUSE,TECH,CTECH,EC,YEAR)**: Device Retrofit Market Share Multiplier** (1/YR)

The non-price factors(RDMSM0) in the device retrofit decision making process is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. RDMSM0 is used to modify the retrofit device market allocation weight which is used to determine the market share for each fuel in the device retrofit procedure in the demand sector.

RDMSMI (ENDUSE,TECH,CTECH,EC,YEAR)**: Device Retrofit Market Share Multiplier** (1/YR)

The RDMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The RDMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. RMSMI modifies the retrofit device market share equation in the demand sector.

RDMSMI (ENDUSE,TECH,CTECH,EC,YEAR)**: Device Retrofit Market Share Multiplier** (1/YR)

The RDMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The RDMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. RMSMI modifies the retrofit device market share equation in the demand sector.

RDVF (ENDUSE,TECH,CTECH,EC,YEAR)**: Device Retrofit Market Share Variance Factor** (DLESS)

The variance factor captures uncertainty in the decision making process, especially imperfect information concerning relative prices. It is used in estimating the number of device retrofits that will occur.

RDVF (ENDUSE,TECH,CTECH,EC,YEAR)**: Device Retrofit Market Share Variance Factor** (DLESS)

The variance factor captures uncertainty in the decision making process, especially imperfect information concerning relative prices. It is used in estimating the number of device retrofits that will occur.

RE (YEAR)**: Retained Earnings** (M$)

Retained earnings are the integral of income after dividends are paid minus the retained earnings portion of funds spent to repurchase common stock plus any miscellaneous additions to retained earnings.

RE (YEAR)**: Retained Earnings** (M$)

Retained earnings are the integral of income after dividends are paid minus the retained earnings portion of funds spent to repurchase common stock plus any miscellaneous additions to retained earnings.

RESI (PLANT)**: Resource Base** (GJ)

The resource base is an exogenously specified limit on scarce resources (land or water for example) used in the calculation of the depletion multiplier (DM).

RESI (PLANT)**: Resource Base** (GJ)

The resource base is an exogenously specified limit on scarce resources (land or water for example) used in the calculation of the depletion multiplier (DM).

REV (YEAR)**: Revenues** (M$/YR)

Total revenue from electricity sales is the sum of revenue by class, over class.

REV (YEAR)**: Revenues** (M$/YR)

Total revenue from electricity sales is the sum of revenue by class, over class.

RGA (AA,YEAR)**: Retire. of GA from Construction Cost** (M$/YR)

Retiring gross assets from the construction costs are a function of the ratio of old gross assets to the assets' physical lifetime.

RGA (AA,YEAR)**: Retire. of GA from Construction Cost** (M$/YR)

Retiring gross assets from the construction costs are a function of the ratio of old gross assets to the assets' physical lifetime.

RIC (POWER,YEAR)**: Regional Interchange Capacity** (MW)

Regional interchange capacity are exogenously specified contracts for capacity from other utilities used in the determination of total capacity.

RIC (POWER,YEAR)**: Regional Interchange Capacity** (MW)

Regional interchange capacity are exogenously specified contracts for capacity from other utilities used in the determination of total capacity.

RMARGIN (YEAR)**: Reserve Margin Inc. Pool Sales** (Frac.)

The reserve margin is calculated as the total generating capacity divided by the peak MW in the peak season minus 1.0. Regional interchange agreements are included if appropriate.

RMARGIN (YEAR)**: Reserve Margin Inc. Pool Sales** (Frac.)

The reserve margin is calculated as the total generating capacity divided by the peak MW in the peak season minus 1.0. Regional interchange agreements are included if appropriate.

RMSM0 (ENDUSE,TECH,EC,YEAR)**: Retrofit Market Share Multiplier** (1/YR)

The non-price factors(RMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. RMSM0 is used to modify the market allocation weight which is used to determine the market share for each fuel in the retrofit procedure in the demand sector.

RMSM0 (ENDUSE,TECH,EC,YEAR)**: Retrofit Market Share Multiplier** (1/YR)

The non-price factors(RMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. RMSM0 is used to modify the market allocation weight which is used to determine the market share for each fuel in the retrofit procedure in the demand sector.

RMSMI (ENDUSE,TECH,EC,YEAR)**: Retrofit Market Share Multiplier** (1/YR)

The RMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The RMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. RMSMI modifies the retrofit market share equation in the demand sector.

RMSMI (ENDUSE,TECH,EC,YEAR)**: Retrofit Market Share Multiplier** (1/YR)

The RMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The RMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. RMSMI modifies the retrofit market share equation in the demand sector.

ROIN (EC)**: Return on Investment** (($/YR)/$)

This variable is the long term real return on investment necessary to keep dollars in capital formation. National sources are used for this variable, the default value currently coming from Demand '81. It is used to calculate the capital charge rate.

ROIN (EC)**: Return on Investment** (($/YR)/$)

This variable is the long term real return on investment necessary to keep dollars in capital formation. National sources are used for this variable, the default value currently coming from Demand '81. It is used to calculate the capital charge rate.

RPCC (ENDUSE,TECH,EC)**: Retrofit Process Capital Cost** ($/($/YR))

The determination of the level of retrofit process capital cost selected by consumers depends on the level of efficiency chosen which in turn depends on the price of energy. ENERGY 2020 also captures technological improvements that can yield more efficiency for the same capital cost. It is calculated in the process retrofit procedure in the demand sector as a table function of RPEE.

RPCC (ENDUSE,TECH,EC)**: Retrofit Process Capital Cost** ($/($/YR))

The determination of the level of retrofit process capital cost selected by consumers depends on the level of efficiency chosed which in turn depends on the price of energy. ENERGY 2020 also captures technological improvements that can yield more efficiency for the same capital cost. It is calculated in the process retrofit procedure in the demand sector as a table function of RPEE.

RPCCT (ENDUSE,EFFI,TECH,EC)**: Price vs Capital Cost Process Retrofit Table** ($/mBtu or $/GJ)

A calibrated table indicating the level of efficiency(or fuel price) for each capital cost.

RPCCT (ENDUSE,EFFI,TECH,EC)**: Price vs. Capital Cost Process Retrofit Table** ($/mBtu or $/GJ)

A calibrated table indicating the level of efficiency(or fuel price) for each capital cost.

RPCCU (ENDUSE,TECH,EC,YEAR)**: Process Retrofit Rebate**

The RPCCU is a policy input variable that varies with the retrofit policy being tested. By definition the subsidy cannot exceed the cost of the process capital. It is used to alter the process capital cost(PCC) and thereby change the level of efficiency(PEE) selected by consumers and, in the case of retrofits, induce consumers to purchase new, higher efficiency energy using capital before the old lifetime expires.

RPCCU (ENDUSE,TECH,EC,YEAR)**: Process Retrofit Rebate**

The RPCCU is a policy input variable that varies with the retrofit policy being tested. By definition the subsidy cannot exceed the cost of the process capital. It is used to alter the process capital cost(PCC) and thereby change the level of efficiency(PEE) selected by consumers and, in the case of retrofits, induce consumers to purchase new, higher efficiency energy using capital before the old lifetime expires.

RPEE (ENDUSE,TECH,EC,YEAR)**: Retrofit Process Efficiency** ($/Btu or $/J)

RPEE - the retrofit process efficiency, is calculated in the same manner as PCC - as a function of the marginal cost of fuel use. The calculation is performed in the process retrofit procedure in the demand sector.

RPEE (ENDUSE,TECH,EC,YEAR)**: Retrofit Process Efficiency** ($/Btu or $/J)

RPEE - the retrofit process efficiency, is calculated in the same manner as PCC - as a function of the marginal cost of fuel use. The calculation is performed in the process retrofit procedure in the demand sector.

RPEET (ENDUSE,EFFI,TECH,EC)**: Price vs. Efficiency Process Retrofit Table** (Btu/Btu or J/J)

The level of process efficiency selected depends on fuel costs. This table relates fuel costs to levels of process efficiency. It is used to calculate the process efficiency(PEE) in the RETROFIT procedure in the demand sector.

RPEET (ENDUSE,EFFI,TECH,EC)**: Price vs. Efficiency Process Retrofit Table** (Btu/Btu or J/J)

The level of process efficiency selected depends on fuel costs. This table relates fuel costs to levels of process efficiency. It is used to calculate the process efficiency(PEE) in the RETROFIT procedure in the demand sector.

RPMSM0 (ENDUSE,TECH,EC,YEAR)**: Process Retrofit Market Share Multiplier** (1/YR)

The non-price factors(RPMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. RPMSM0 is used to modify the process retrofit market allocation weight which is used to determine the market share for each fuel in the process retrofit procedure in the demand sector.

RPMSM0 (ENDUSE,TECH,EC,YEAR)**: Process Retrofit Market Share Multiplier** (1/YR)

The non-price factors(RPMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. RPMSM0 is used to modify the process retrofit market allocation weight which is used to determine the market share for each fuel in the process retrofit procedure in the demand sector.

RPMSMI (ENDUSE,TECH,EC)**: Process Retrofit Multiplier From Income** (1/YR)

The RPMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The RPMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. RMSMI modifies the retrofit process market share equation in the demand sector.

RPMSMI (ENDUSE,TECH,EC)**: Process Retrofit Multiplier From Income** (1/YR)

The RPMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The RPMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. RMSMI modifies the retrofit process market share equation in the demand sector.

RPVF (ENDUSE,TECH,EC)**: Process Retrofit Market Share Variance Factor** (DLESS)

The variance factor captures uncertainty in the decision making process, especially imperfect information concerning relative prices. It is used in estimating the number of device retrofits that will occur.

RPVF (ENDUSE,TECH,EC)**: Process Retrofit Market Share Variance Factor** (DLESS)

The variance factor captures uncertainty in the decision making process, especially imperfect information concerning relative prices. It is used in estimating the number of device retrofits that will occur.

RV (CLASS,YEAR)**: Elect. Revenues by Revenue Class** (M$/YR)

Revenue by class equals the price of electricity (PE) multiplied by electricity sales by class (SALES).

RV (CLASS,YEAR)**: Elect. Revenues by Revenue Class** (M$/YR)

Revenue by class equals the price of electricity (PE) multiplied by electricity sales by class (SALES).

RVTAXR : Revenue Tax Rate (Frac.)

A policy variable, the revenue tax rate can be multiplied by revenue and added to PTAX - property and state taxes.

RVTAXR : Revenue Tax Rate (Frac.)

A policy variable, the revenue tax rate can be multiplied by revenue and added to PTAX - property and state taxes.

SALES (CLASS,FUEL,YEAR)**: Annual Sales of Electricity**

Calculated in the demand sectors, annual electric sales is used in the price calculation.

SALES (CLASS,FUEL,YEAR)**: Sales** (Natural Units/YR)

Sales are calculated in the demand sector in natural units(e.g. kWh for electricity, mcf for natural gas, etc.) This variable is an aggregation of ECSALES, summed over EC and enduses.

SALES (CLASS,FUEL,YEAR)**: Annual Sales of Electricity** (gWh)

Calculated in the demand sectors, annual electric sales is used in the price calculation.

SALES (CLASS,FUEL,YEAR)**: Sales** (Natural Units/YR)

Sales are calculated in the demand sector in natural units(e.g. kWh for electricity, mcf for natural gas, etc.) This variable is an aggregation of ECSALES, summed over EC and enduses.

SALESM (RTCLASS,LV2,YEAR)**: Level for Electricity Sales Extrap.**

The smoothed value of electricity sales is the integral of sales over time. This value is updated by replacing a fraction of the old value determined by the smoothing time.

SALESM (RTCLASS,LV2,YEAR)**: Level for Electricity Sales Extrap.**

The smoothed value of electricity sales is the integral of sales over time. This value is updated by replacing a fraction of the old value determined by the smoothing time.

SCBACKUP (RESOURCE)**: Project Back-up Power Requirements** (0=None,1=Battery)

Used in the calculation of capacity if the resource requires back-up capacity. Backup in the form of a battery is initiated. Used for exogenous plant type specifications.

SCBACKUP (RESOURCE)**: Project Back-up Power Requirements** (0=None,1=Battery)

Used in the calculation of capacity if the resource requires back-up capacity. Backup in the form of a battery is initiated. Used for exogenous plant type specifications.

SCGC (RESOURCE)**: Capacity Available** (MW)

The capacity available is an exogenously specified supply curve for new plant construction, ordered by cost, pollution or any other criteria determined by the user. It is used to calculate the amount of capacity awarded to each project (PJCI) . Used for exogenous plant type specifications. .

SCGC (RESOURCE)**: Capacity Available** (MW)

The capacity available is an exogenously specified supply curve for new plant construction, ordered by cost, pollution or any other criteria determined by the user. It is used to calculate the amount of capacity awarded to each project (PJCI) . Used for exogenous plant type specifications. .

SCGCCCM (RESOURCE)**: Project Capital Costs Multiplier** ($/$)

The capital cost multiplier (GCCCM) is set equal to this exgoneously specified input variable,

SCGCCCM (RESOURCE)**: Project Capital Costs Multplier** ($/$)

The capital cost multiplier (GCCCM) is set equal to this exgoneously specified input variable,

SCGCCI (RESOURCE,YEAR)**: Cumulative Capacity Initiated** (MW)

SCGGI is the cumulative capacity already initiated at the time of new construction decisions. It is subtracted from SCGC in the equation that determines the amount of capacity awarded to each project.

SCGCCI (RESOURCE,YEAR)**: Cumulative Capacity Initiated** (MW)

SCGGI is the cumulative capaicyt already initiated at the time of new construction decisions. It is subtracted from SCGC in the equation that determines the amount of capacity awarded to each project.

SCMPS (RESOURCE)**: Minimum Project Size** (MW)

This is the projects minimum size, in MW. It is used in the determination of the capacity of projects initiated (PJCI). Used for exogenous plant type specifications.

SCMPS (RESOURCE)**: Minimum Project Size** (MW)

This is the projects minimum size, in MW. It is used in the determination of the capacity of projects initiated (PJCI). Used for exogenous plant type specifications.

SCPOINTER (POWER,YEAR)**: Pointer to Current Resource Option**

This pointer moves the model up the utility generating supply curve. If the remaining capacity (SCGC-SCGCCI) is not positive then the resource pointer is incremented to the next resource (replenishing SCGC).

SCPOINTER (POWER,YEAR)**: Pointer to Current Resource Option**

This pointer moves the model up the utility generating supply curve. If the remaining capacity (SCGC-SCGCCI) is not positive then the resource pointer is incremented to the next resource (replenishing SCGC).

SDIN (YEAR)**: Interest on Short Term Debt** (M$/YR)

Short-term debt interest payments are calculated from construction work in progress (TCW) times the interest rate on new debt.

SDIN (YEAR)**: Interest on Short Term Debt** (M$/YR)

Short-term debt interest payments are calculated from construction work in progress (TCW) times the interest rate on new debt.

SEB : Society Service Energy Bill ($/YEAR)

Society Service Energy Bill is calculated in the total demand procedure of the demand sector as the product of the process energy requirements times the marginal cost of that energy.

SEB : Society Service Energy Bill ($/YEAR)

Society Service Energy Bill is calculated in the total demand procedure of the demand sector as the product of the process energy requirements times the marginal cost of that energy.

SFAC (YEAR)**: Spent Fuel Disposal Costs Escrow Account** (M$)

A spent fuel disposal costs escrow account is calculated from expected unit spent fuel disposal costs and nuclear generation

SFAC (YEAR)**: Spent Fuel Disposal Costs Escrow Account** (M$)

A spent fuel disposal costs escrow account is calculated from expected unit spent fuel disposal costs and nuclear generation

SFACI : Initial Spent Fuel Disposal Costs Escrow Acct. (M$)

An exogenously specified input variable used to initialize the model.

SFACI : Initial Spent Fuel Disposal Costs Escrow Acct. (M$)

An exogenously specified input variable used to initialize the model.

SFDC (YEAR)**: Spent Fuel Disposal Costs** (MILLS/kWh)

An exogenously specified input used in the calculation of SFAC.

SFDC (YEAR)**: Spent Fuel Disposal Costs** (MILLS/kWh)

An exogenously specified input used in the calculation of SFAC.

SI (YEAR)**: Government Bonds** (M$)

Government bonds represents a short term account in the model where excess funds can be invested. It is assumed these investments achieve the same rate of return as government bonds. SI in the integral of bonds purchased (SIPU) and bonds withdrawn (SIFD)

SI (YEAR)**: Government Bonds** (M$)

Government bonds represents a short term account in the model where excess funds can be invested. It is assumed these investments achieve the same rate of return as government bonds. SI in the integral of bonds purchased (SIPU) and bonds withdrawn (SIFD)

SIFD (YEAR)**: Funds from Selling Government Bonds** (M$/YR)

When short term investments are liquidated they become funds from selling government bonds. SIFD is used in the Government bonds (SI) calculation.

SIFD (YEAR)**: Funds from Selling Government Bonds** (M$/YR)

When short term investments are liquidated they become funds from selling government bonds. SIFD is used in the Government bonds (SI) calculation.

SII : Initial Amount of Government Bonds (M$)

This is an exogenously specified input variable representing the initial level of utility short term investments.

SII : Initial Amount of Government Bonds (M$)

This is an exogenously specified input variable representing the initial level of utility short term investments.

SIIR (YEAR)**: Interest Rate of Short Term Investments** (1/YR)

The return on short-term investments is assumed to a have a real return equal to those on government bonds. The value also includes inflation by the addition of the smoothed inflation rate.

SIIR (YEAR)**: Interest Rate of Short Term Investments** (1/YR)

The return on short-term investments is assumed to a have a real return equal to those on government bonds. The value also includes inflation by the addition of the smoothed inflation rate.

SILGC (MONTH,YEAR)**: Monthly Interruptible Load Effective Gen. Capacity** (MW)

Interruptible load generating capacity is an exogenously specified input variable used in the calculation of peak future generating capacity.

SILGC (MONTH,YEAR)**: Monthly Interruptible Load Effective Gen. Capacity** (MW)

Interruptible load generating capacity is an exogenously specified input variable used in the calculation of peak future generating capacity.

SIPR : Government Bonds Risk Premium (1/YR)

The government bond risk premium represents the real rate of return required on government bonds (the actual rate less inflation). It is exogenously specified.

SIPR : Government Bonds Risk Premium (1/YR)

The government bond risk premium represents the real rate of return required on government bonds (the actual rate less inflation). It is exogenously specified.

SIPU (YEAR)**: Funds Used to Purchase Govt. Bonds** (M$/YR)

If a utility has funds left over from business operations and common stock reinvestments is can use excess cash to buy short term investments (SIPU).

SIPU (YEAR)**: Funds Used to Purchase Govt. Bonds** (M$/YR)

If a utility has funds left over from business operations and common stock reinvestments is can use excess cash to buy short term investments (SIPU).

SLDC : System Load Duration Curve

The utility system load duration curve is represented by the sum of the class load duration curves over sales class corrected by transmission and distribution losses. Three points on this curve are specifically identified: the largest of the seasonal peaks is the system peak, PDP; the smallest is the system minimum, MDP. The annual average load is the average demand, ADP.

SLDC : System Load Duration Curve

The utility system load duration curve is represented by the sum of the class load duration curves over sales class corrected by transmission and distribution losses. Three points on this curve are specifically identified: the largest of the seasonal peaks is the system peak, PDP; the smallest is the system minimum, MDP. The annual average load is the average demand, ADP.

SLDGI : Initial Value of Forecast System Load Curve

An exogenously specified input variable used to initialize the model.

SLDGI : Initial Value of Forecast System Load Curve

An exogenously specified input variable used to initialize the model.

SLDP (AA,YEAR)**: Straight Line Depreciation** (M$/YR)

Straight Line Depreciation by asset type is the sum of the depreciation of GACW and GAAF.

SLDP (AA,YEAR)**: Straight Line Depreciation** (M$/YR)

Straight Line Depreciation by asset type is the sum of of the depreciation of GACW and GAAF.

SLDPR (YEAR)**: Total Straight Line Depreciation** (M$/YR)

Total Depreciation is depreciation by asset types (SLDP) summed across asset types.

SLDPR (YEAR)**: Total Straight Line Depreciation** (M$/YR)

Total Depreciation is depreciation by asset types (SLDP) summed across asset types.

SMCFU (TECH,EC,YEAR)**: Marginal Cost of Fuel Use** ($/mBtu or $/GJ)

The system marginal cost of fuel use(SMCFU) is computed in the fuel system procedure in the demand sector and is the sum of the annualized capital cost of the device plus the device operation and maintenance costs plus the unit cost of fuel. It is used to calculate the fuel system market shares.

SMCFU (TECH,EC,YEAR)**: Marginal Cost of Fuel Use** ($/mBtu or $/GJ)

The system marginal cost of fuel use(SMCFU) is computed in the fuel system procedure in the demand sector and is the sum of the annualized capital cost of the device plus the device operation and maintenance costs plus the unit cost of fuel. It is used to calculate the fuel system market shares.

SMCFU0 (TECH,EC,FIRST)**: Marginal Cost of Fuel Use** ($/mBtu or $/GJ)

The system marginal cost of fuel use(SMCFU) is computed in the fuel system procedure in the demand sector and is the sum of the annualized capital cost of the device plus the device operation and maintenance costs plus the unit cost of fuel. It is used to calculate the fuel system market shares.

SMCFU0 (TECH,EC,FIRST)**: Marginal Cost of Fuel Use** ($/mBtu or $/GJ)

The system marginal cost of fuel use(SMCFU) is computed in the fuel system procedure in the demand sector and is the sum of the annualized capital cost of the device plus the device operation and maintenance costs plus the unit cost of fuel. It is used to calculate the fuel system market shares.

SMSF (TECH,EC,YEAR)**: Market Share Fraction by Device** ($/$)

The system marginal market share fractions(SMSF) are a function of both price and non-price factors. The price factors are the cost of using fuel(MCFU), the marginal process efficiency(PEE) and the process capital cost(PCC). Non-price factors(MSMM) include poor consumer information plus other non-price fuel attributes. The calculation of SMSF is performed in the demand sector and it is used to calculate MMSF1.

SMSF (TECH,EC,YEAR)**: Market Share Fraction by Device** ($/$)

The system marginal market share fractions(SMSF) are a function of both price and non-price factors. The price factors are the cost of using fuel(MCFU), the marginal process efficiency(PEE) and the process capital cost(PCC). Non-price factors(MSMM) include poor consumer information plus other non-price fuel attributes. The calculation of SMSF is performed in the demand sector and it is used to calculate MMSF1.

SMSM0 (TECH,EC,YEAR)**: Market Share Multiplier Constraint** ($/$)

The non-price factors(SMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices). Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. SMSM0 is used to modify the fuel system market allocation weight which is used to determine the market share for each fuel in the fuel system procedure in the demand sector.

SMSM0 (TECH,EC,YEAR)**: Market Share Multiplier Constraint** ($/$)

The non-price factors(SMSM0) is a calibrated variable derived from a comparison of the model-generated historical fuel splits with that actual splits. Using historical prices, we can estimate the non-price factors(the deviation from the economically optimal split based on historical prices).

Many non-price factors are captured by this variable such as imperfect information, split incentives, or personal, non-price determined perceptions such as the perceived safety of a particular fuel as well as any other non-price taste and institutional barrier effects. SMSM0 is used to modify the fuel system market allocation weight which is used to determine the market share for each fuel in the fuel system procedure in the demand sector.

SMSMI (TECH,EC,YEAR)**: Market Share Multiplier from Income** ($/$)

The SMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The SMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. SMSMI modifies the fuel system market share equation in the demand sector.

SMSMI (TECH,EC,YEAR)**: Market Share Multiplier from Income** ($/$)

The SMSMI is one of three income effect factors(the other two are GO(gross output) and POP(population)). The SMSM1 is a measure of income elasticity. Theory indicates that as income increases(GO/POP), fuel market shares change. In other words, as the income of residential customers begins to climb, they may show a different preference for fuel choices - a shift in the non-price factors. For example, an "all electric" house may be perceived as cleaner and a good worth purchasing as incomes rise, causing more residential customers to choose electricity over natural for space heating, water heating and drying needs. SMSMI modifies the fuel system market share equation in the demand sector.

SOLARSW : Solar Switch for Calculation of Solar Demand

If set equal to one, SOLARSW turns on an endogenous solar demand calculation in the total demand procedure in the demand sector.

SOLARSW : Solar Switch for Calculation of Solar Demand

If set equal to one, SOLARSW turns on an enogenous solar demand calculation in the total demand procedure in the demand sector.

SOR (PLANT,MONTH,YEAR)**: Scheduled Outage Rate** (Fraction)

The scheduled outage rate is an exogenously specified input variable that is used in the calculation of the plant availability factor. This factor is then applied to generation capacity to yield effective generating capacity, usually by season.

SOR (PLANT,MONTH,YEAR)**: Scheduled Outage Rate** (Fraction)

The scheduled outage rate is an exogenously specified input variable that is used in the calculation of the plant availability factor. This factor is then applied to generation capacity to yield effective generating capacity, usually by season.

SPOP (EC)**: Population** (MILLIONS)

SPOP is the sum over ECC of POP.

SPOP (EC)**: Population** (MILLIONS)

SPOP is the sum over ECC of POP.

SPOP0 (EC)**: Population** (MILLIONS)

SPOP is the sum over ECC of POP. Calculation is performed in the demand sector and the variable is used to determine market share fractions.

SPOP0 (EC)**: Population** (MILLIONS)

SPOP is the sum over ECC of POP. Calculation is performed in the demand sector and the variable is used to determine market share fractions.

STCO (EC)**: Total Capital Output Capacity** (M$/YR)

STCO is the sum across ECC of the Production Capacity defined in the economic sector. It is used in the calculation of market shares(in the determination of the market allocation weights(MAW). STCO is calculated in the TPRICE procedure in the demand sector.

STCO (EC)**: Total Capital Output Capacity** (M$/YR)

STCO is the sum across ECC of the Production Capacity defined in the economic sector. It is used in the calculation of market shares(in the determination of the market allocation weights(MAW). STCO is calculated in the TPRICE procedure in the demand sector.

STCO0 (EC)**: Total Capital Output Capacity** (M$/YR)

STCO is the sum across ECC of the Production Capacity defined in the economic sector. It is used in the calculation of market shares(in the determination of the market allocation weights(MAW). STCO is calculated in the TPRICE procedure in the demand sector.

STCO0 (EC)**: Total Capital Output Capacity** (M$/YR)

STCO is the sum across ECC of the Production Capacity defined in the economic sector. It is used in the calculation of market shares(in the determination of the market allocation weights(MAW). STCO is calculated in the TPRICE procedure in the demand sector.

STX (YEAR)**: Sales Tax Rate on Energy Consumer** ($/$)

Local energy consumption taxes are captured by this variable. It is used throughout the demand sector in the calculation of capital costs and indirectly, efficiency levels. Variable values can be found in state and local sources.

STX (YEAR)**: Sales Tax Rate on Energy Consumer** ($/$)

Local energy consumption taxes are captured by this variable. It is used throughout the demand sector in the calculation of capital costs and indirectly, efficiency levels. Variable values can be found in state and local sources.

STX0 (ZERO)**: Sales Tax Rate on Energy Consumer** ($/$)

Local energy consumption taxes are captured by this variable. It is used throughout the demand sector in the calculation of capital costs and indirectly, efficiency levels. Variable values can be found in state and local sources.

STX0 (ZERO)**: Sales Tax Rate on Energy Consumer** ($/$)

Local energy consumption taxes are captured by this variable. It is used throughout the demand sector in the calculation of capital costs and indirectly, efficiency levels. Variable values can be found in state and local sources.

SVF (TECH,EC)**: System Variance Factor** ($/$)

Used in the market share calculation in the fuel system procedure in the demand sector, this calibrated variable picks up such barriers to optimal decision making such as imperfect information on the part of the consumer.

SVF (TECH,EC)**: System Variance Factor** ($/$)

Used in the market share calculation in the fuel system procedure in the demand sector, this calibrated variable picks up such barriers to optimal decision making such as imperfect information on the part of the consumer.

TA (AA,YEAR)**: Tax Assets** (M$)

Tax assets are increased by completed construction (existing TA plus GWGAA) and are reduced by depreciation.

TA (AA,YEAR)**: Tax Assets** (M$)

Tax assets are increased by completed construction (existing TA plus GWGAA) and are reduced by depreciation.

TAF (YEAR)**: AFUDC Generated in Current Period** (M$/YR)

Total AFUDC generated in current period is the sum, over plant type, of AFUDC into gross assets (AFGS).

TAF (YEAR)**: AFUDC Generated in Current Period** (M$/YR)

Total AFUDC generated in current period is the sum, over plant type, of AFUDC into gross assets (AFGS).

TAI (AA)**: Initial Amount of Tax Assets** (M$)

The initial amount of Tax Assets are set equal to net asset (XNA) in EDATA.

TAI (AA)**: Initial Amount of Tax Assets** (M$)

The initial amount of Tax Assets are set equal to net asset (XNA) in EDATA.

TATDP (YEAR)**: Total Accelerated Tax Depreciation** (M$/YR)

Total accelerated tax depreciation is depreciation by asset type summed over assets.

TATDP (YEAR)**: Total Accelerated Tax Depreciation** (M$/YR)

Total accelerated tax depreciation is depreciation by asset type summed over assets.

TAXR (YEAR)**: Income Tax Rate** (DLESS)

An exogenously specified input (also a policy variable) used in the calculation of the capital charge rate.

TAXR (YEAR)**: Income Tax Rate** (DLESS)

An exogenously specified input (also a policy variable) used in the calculation of the capital charge rate.

TCR (YEAR)**: Investment Tax Credit Rate** ($/$)

An exogenously specified input used in the calculation of the capital charge rate.

TCR (YEAR)**: Investment Tax Credit Rate** ($/$)

An exogenously specifed input used in the calculation of the capital charge rate.

TCUC (POWER,YEAR)**: Total Capacity under Construction** (MW)

Total capacity under construction is the sum of the construction by type. It is used to calculate the total amount of capacity in the future.

TCUC (POWER,YEAR)**: Total Capacity under Construction** (MW)

Total capacity under construction is the sum of the construction by type. It is used to calculate the total amount of capacity in the future.

TCW (YEAR)**: Generating Plant Construction Expenditures** (M$/YR)

Generating plant construction expenditures is the sum of CW over plan type and construction schedule and capacity additions over all plant capacity.

TCW (YEAR)**: Generating Plant Construction Expenditures** (M$/YR)

Generating plant construction expenditures is the sum of CW over plan type and construction schedule and capacity additions over all plant capacity.

TCWAC (PLANT,YEAR)**: CWIP plus AFUDC Accumulated** (M$)

For accounting purposes, TCWAC by plant is calculated from accumulated AFUDC and CWIP by summing over the levels.

TCWAC (PLANT,YEAR)**: CWIP plus AFUDC Accumulated** (M$)

For accounting purposes,TCWAC by plant is calculated from accumulated AFUDC and CWIP by summing over the levels.

TDCAR (TD,YEAR)**: T&D Capital Additions Rate** (Fraction)

Transmission and distribution facilities are added when forecasted peak demand indicates additional T&D capacity is needed.

TDCAR (TD,YEAR)**: T&D Capital Additions Rate** (Fraction)

Transmission and distribution facilities are added when forecasted peak demand indicates additional T&D capacity is needed.

TDCC (TD,YEAR)**: T&D Capital Costs** ($/KW)

Transmission and Distribution Capital Costs are exogenously specified in $/kW. They are used in the calculation of TDTBF - transmission and distribution to be financed.

TDCC (TD,YEAR)**: T&D Capital Costs** ($/KW)

Transmission and Distribution Capital Costs are exogenously specified in $/kW. They are used in the calculation of TDTBF - transmission and distribution to be financed.

TDCR (TD,YEAR)**: T&D Construction Completion Rate** (MW/YR)

TDCR is the transmission and distribution capacity near completion. TDCR corresponds to capacity additions - the construction time is approximately the same as the base-load plant construction time.

TDCR (TD,YEAR)**: T&D Construction Completion Rate** (MW/YR)

TDCR is the transmission and distribution capacity near completion. TDCR corresponds to capacity additions - the construction time is approximately the same as the base-load plant construction time.

TDCRI (TD)**: T&D Construction Completion Rate Initially** (MW/YR)

TDCRI is the exogenously specified initial value of transmission and distribution associated with generation capacity building not yet on line at the beginning of the historical period. It is calculated in EDATA from the product of TDGCI and PDPGI.

TDCRI (TD)**: T&D Construction Completion Rate Initially** (MW/YR)

TDCRI is the exogenously specified initial value of transmission and distribution associated with generation capacity building not yet on line at the beginning of the historical period. It is calculated in EDATA from the product of TDGCI and PDPGI.

TDCT (TD)**: T&D Construction Time** (YRS)

The transmission and distribution construction time is approximately the same as the base-load plant construction time.

TDCT (TD)**: T&D Construction Time** (YRS)

The transmission and distribution construction time is approximately the same as the base-load plant construction time.

TDEF (YEAR)**: Electric Transmission and Distribution Efficiency** MW/MW

Transmission and distribution efficiency is calculated in EDATA as the ratio of electricity sales (XTSALE) to electricity available (XTEA).

TDEF (YEAR)**: Electric Transmission and Distribution Efficiency** (MW/MW)

Transmission and distribution efficiency is calculated in EDATA as the ratio of electricity sales (XTSALE) to electricity available (XTEA).

TDGC (TD,YEAR)**: T&D Capacity** (MW)

Transmission and Distribution Capacity is treated as a simple system dynamics LEVEL. It is the integral of retirements and construction. Retirements are based on an average effective lifetime and attempts to capture capital replacements and additions to existing facilities rather than actual retirements.

TDGC (TD,YEAR)**: T&D Capacity** (MW)

Transmission and Distribution Capacity is treated as a simple system dynamics LEVEL. It is the integral of retirements and construction. Retirements are based on an average effective liefetime and attemps to capture capital replacements and additions to existing facilities rather than actual retirements.

TDGCI (TD)**: Initial Transmission & Distribution Cap.** (MW)

TDGCI is the exogenously specified initial value of transmission and distribution capacity.

TDGCI (TD)**: Initial Transmission & Distribution Cap.** (MW)

TDGCI is the exogenously specified initial value of transmission and distribution capacity.

TDICR (CLASS,TD)**: Indicated T&D Construction Rate** (MW)/year

The indicated transmission and distribution construction rate for each class is a function of the class' contribution to the peat, the T&D reserve margin, the T&D generating capacity and the T&D construction completion rate.

TDICR (CLASS,TD)**: Indicated T&D Construction Rate** (SALESMW/year)

The indicated transmission and distribution construction rate for each class is a function of the class' contribution to the peat, the T&D reserve margin, the T&D generating capacity and the T&D construction completion rate.

TDOMC (TD,YEAR)**: T&D Operation and Maintenance Costs** (M$/YR)

Transmission and distribution operation costs are calculated as the unit T&D costs multiplied by the T&D capacity.

TDOMC (TD,YEAR)**: T&D Operation and Maintenance Costs** (M$/YR)

Transmission and distribution operation costs are calculated as the unit T&D costs multiplied by the T&D capacity.

TDPL (TD)**: Transmission and Distribution Plant Life** (YRS)

An exogenously specified variable used to calculate the transmission and distribution retirement rate.

TDPL (TD)**:** **Transmission and Distribution Plant Life** (YRS)

An exogenously specified variable used to calculate the transmission and distribution retirement rate.

TDRM (TD,YEAR)**:** **Transmission and Distribution Reserve Margin** (MW/MW)

Analogous to the capacity DRM, the TDRM is an exogenously specified input used to increase the amount of Transmission and Distribution capacity relative to the actual load.

TDRM (TD,YEAR)**:** **Transmission and Distribution Reserve Margin** (MW/MW)

Analogus to the capacity DRM, the TDRM is an exogenously specified input used to increase the amount of Transmission and Distribution capacity relative to the actual load.

TDRR (TD,YEAR)**:** **T&D Retirement Rate** (MW/YR)

Retirements are based on an average effective lifetime and is an attempt to capture capital replacements and additions to existing facilities rather than actual retirements.

TDRR (TD,YEAR)**:** **T&D Retirement Rate** (MW/YR)

Retirements are based on an average effective liefetime and is an attempt to capture capital replacements and additions to existing facilities rather than actual retirements.

TDTBF (TD,YEAR)**:** **T&D to be Financed** (M$/YR)

Transmission and Distribution to be Financed is calculated as the product of the additions required times the transmission and distribution capital cost.

TDTBF (TD,YEAR)**:** **T&D to be Financed** (M$/YR)

Transmission and Distribution to be Financed is calculated as the product of the additions required times the transmission and distribution capital cost.

TDUMC (TD,YEAR)**:** **Trans. & Dist. Unit O&M Cost** ($/KW/YR)

A calibrated variable used in the calculation of total transmission and distribution operation and maintenance costs.

TDUMC (TD,YEAR)**:** **Trans. & Dist. Unit O&M Cost** ($/KW/YR)

A calibrated variable used in the calculation of total transmission and distribution operation and maintenace costs.

TEA (YEAR)**:** **Total Electricity Available** (gWh/YR)

Total electricity available is total generation plus purchases for the year.

TEA (YEAR)**:** **Total Electricity Available** (GWH/YR)

Total electricity available is total generation plus purchases for the year.

TEG (YEAR)**:** **Total Electricity Generated** (gWh/YR)

Total electricity generated is the sum of the generation by plant (EG).

TEG (YEAR)**:** **Total Electricity Generated** (GWH/YR)

Total electricity generated is the sum of the generation by plant (EG).

TEGC (DISPATCH,MONTH)**:** **Total Effective Generating Capacity** (MW)

For each dispatch type, the total effective generating capacity is equal to the lesser of itself or the dispatch limit.

TEGC (DISPATCH,MONTH)**:** **Total Effective Generating Capacity** MW

For each dispatch type, the total effective generating capacity is equal to the lesser of itself or the dispatch limit.

TENMSM (TECH)**:** **Energy Supply Constraint Multiplier** (Btu/Btu or J/J)

This variable is used to constrain the market allocation weights to represent unexpected energy shortages in the demand sector. The Energy Supply Constraint Multiplier(ENMSM) from which TENMSM is derived is found in the supply sector. It can be altered by fuel to reflect temporary or permanent deviations from current levels. Summed over fuels, the ENMSM becomes TENMSM. The default value is equal to one which means there are no additional constraints on the energy supply.

TENMSM (TECH)**:** **Energy Supply Constraint Multiplier** (Btu/Btu or J/J)

This variable is used to constrain the market allocation weights to represent unexpected energy shortages in the demand sector. The Energy Supply Constraint Multiplier(ENMSM) from which TENMSM is derived is found in the supply sector. It can be altered by fuel to reflect temporary or permanent deviations from current levels. Summed over fuels, the ENMSM becomes TENMSM. The default value is equal to one which means there are no additional constraints on the energy supply.

TFC (YEAR)**: Total Fuel Cost** (M$/YR)

Total system fuel costs equal the sum of plant fuel costs (FC).

TFC (YEAR)**: Total Fuel Cost** (M$/YR)

Total system fuel costs equal the sum of plant fuel costs (FC).

TFPOL (ES,FUEL,POLL,YEAR)**: Energy Sector Pollution** (TONS/YR)

Total Pollution by energy sector and fuel is calculated in the demand sector and is the sum of DMD times the average pollution plus the pollution from cogeneration. It is used to calculate total sector pollution(TSPOL).

TFPOL (ES,FUEL,POLL,YEAR)**: Energy Sector Pollution** (TONS/YR)

Total Pollution by energy sector and fuel is calculated in the demand sector and is the sum of DMD times the average pollution plus the pollution from cogeneration. It is used to calculate total sector pollution(TSPOL).

TFPOL (FUEL,POLL,YEAR)**: Energy Sector Pollution by Fuel** (TONS/YEAR)

The total pollution by fuel and type is a function of the electric utility fuel demand and the average pollution coefficients.

TFPOL (FUEL,POLL,YEAR)**: Energy Sector Pollution by Fuel** (TONS/YEAR)

The total pollution by fuel and type is a function of the electric utility fuel demand and the average pollution coefficients.

TGAOM (YEAR)**: Total General and Admin. O&M Costs** (M$/YR)

General and Administrative costs are based on total generation and a unit cost in mills/kWh corrected for inflation. A portion of G&A costs are fixed and more dependent on the size of the utility than on generation per se. As a close approximation, generation does reflect the size of the company and this simple functional form is generally adequate.

TGAOM (YEAR)**: Total General and Admin. O&M Costs** (M$/YR)

General and Administrative costs are based on total generation and a unit cost in mills/kWh corrected for inflation. A portion of G&A costs are fixed and more dependednt on the size of the utility than on generation per se. As a close approximation, generation does reflect the size of the company and this simple functional form is generally adequate.

TGC (POWER,YEAR)**: Total Generating Capacity** (MW)

The total existing generating capacity is calculated separately for baseload and peaking needs. Peaking capacity is the sum of the gas/oil plant available plus any pumped storage. Baseload capacity is coal, nuclear and hydro plants. Corrections to both calcuations are made for winter/summer output capabilities.

TGC (POWER,YEAR)**: Total Generating Capacity** (MW)

The total existing generating capacity is calculated separately for baseload and peaking needs. Peaking capacity is the sum of the gas/oil plant available plus any pumped storage. Baseload capacity is coal, nuclear and hydro plants. Corrections to both calculations are made for winter/summer output capabilities.

TINC (ENDUSE,TECH,EC)**: Incentives** (M$/YR)

The incentives(TINC) at the program level to the participant are from rebates(TCONEXP) and low-interest loans(TCONCAP - the NPV of capitalized conservation). This variable is calculated in the DSM post-processing procedure.

TINC (ENDUSE,TECH,EC)**: Incentives** (M$/YR)

The incentives(TINC) at the program level to the participant are from rebates(TCONEXP) and low-interest loans(TCONCAP - the NPV of capitalized conservation). This variable is calculated in the DSM post-processing procedure.

TOM (ENDUSE,TECH,EC)**: Operation/Maintenance Costs** (M$/YR)

TOM is a function of device and process operating cost fractions, capital costs and policy modifiers. It is used to calculate the present value of O&M costs(OM) in the demand sector.

TOM (ENDUSE,TECH,EC)**: Operation/Maintenance Costs** (M$/YR)

TOM is a function of device and process operating cost fractions, capital costs and policy modifiers. It is used to calculate the present value of O&M costs(OM) in the demand sector.

TOMC (YEAR)**: Total Operation and Maintenance Costs** (M$/YR)

Total operation and maintenace costs are the sum of the plant operations and maintance costs (OMC) , transmission and distribution line operations and maintance costs (TDOMC), purchase power costs (PUCT), general administrative costs (TGAOM), and decommissioning costs (DCA).

TOMC (YEAR)**: Total Operation and Maintenance Costs** (M$/YR)

Total operation and maintenance costs are the sum of the plant operations and maintenance costs (OMC) , transmission and distribution line operations and maintenance costs (TDOMC), purchase power costs (PUCT), general administrative costs (TGAOM), and decommissioning costs (DCA).

TOU (ENDUSE,LOAD,SEASON)**: TOU Rate Multiplier** (fraction)

An exogenously specified policy input variable with values that depend on the program being simulated. The TOU will reduce rates for time of use participants according to the policy being simulated.

TOU (ENDUSE,LOAD,SEASON)**: TOU Rate Multiplier** (fraction)

An exogenously specified policy input variable with values that depend on the program being simulated. The TOU will reduce rates for time of use participants according to the policy being simulated.

TOUFR (YEAR)**: TOU Acceptance Fraction** (fraction)

An exogenously specified policy input variable with values that depend on the program being simulated. The TOUFR determines the fraction of possible participants that actually participate in the program being simulated

TOUFR (YEAR)**: TOU Acceptance Fraction** (fraction)

An exogenously specified policy input variable with values that depend on the program being simulated. The TOUFR determines the fraction of possible participants that actually participate in the program being simulated

TOURATIO (LOAD,SEASON)**: Ratio of TOU Rate to Average Price** (fraction)

Used in procedure ETOU which computes electric time-of-use impacts to calculate TOU(Endogenous time of use rate impacts). Variable values come from user from the policy to be simulated. Default value on in the data file equals one(which implies the time of use price and the average price are the same).

TOURATIO (LOAD,SEASON)**: Ratio of TOU Rate to Average Price** (fraction)

Used in procedure ETOU which computes electric time-of-use impacts to calculate TOU(Endogenous time of use rate impacts). Variable values come from user from the policy to be simulated. Default value on in the data file equals one(which implies the time of use price and the average price are the same).

TRISK (ENDUSE,TECH)**: Device Risk Threshold** (Btu/Btu or J/J)

Not currently used in the model.

TRISK (ENDUSE,TECH)**: Device Risk Threshold** (Btu/Btu or J/J)

Not currently used in the model.

TRPC (SECTOR,FUEL,YEAR)**: Societal Cost of Pollution** (M$/YR)

The societal cost of pollution is calculated by multiplying the total pollution by fuel with a societal cost per unit of pollution(POCSTR). This calculation is performed in the demand sector.

TRPC (SECTOR,FUEL,YEAR)**: Societal Cost of Pollution** (M$/YR)

The societal cost of pollution is calculated by multiplying the total pollution by fuel with a societal cost per unit of pollution(POCSTR). This calculation is performed in the demand sector.

TSALE (YEAR)**: Total Annual Usage of Electricity** gWh/YEAR

Calculated in the demand sector total sales is the sum of sales by class. It is used in the calculation of electricity prices.

TSALE (YEAR)**: Total Annual Usage of Electricity** (GWH/YEAR)

Calculated in the demand sector total sales is the sum of sales by class. It is used in the calculation of electricity prices.

TSLDC (CLASS,LOAD,SEASON,YEAR)**: Temperature Sensitive Load Curve**

The Temperature Sensitive Portion of Load(TSLDC) is calculated in the demand sector from the economic class load duration curves times the temperature sensitive load fraction(TSLOAD) and summed across enduses and economic classes.

TSLDC (CLASS,LOAD,SEASON,YEAR)**: Temperature Sensitive Load Curve**

The Temperature Sensitive Portion of Load(TSLDC) is calculated in the demand sector from the economic class load duration curves times the temperature sensitive load fraction(TSLOAD) and summed across enduses and economic classes.

TSLOAD (ENDUSE,EC)**: Temperature Sensitive Fraction of Load** (Btu/Btu or J/J)

Most of the heating and air conditioning load is temperature sensitive but some may not be because of HVAC control system requirements. This fraction is taken from engineering studies or utility data and is found in the *data files. TSLOAD is used in the calculation of DMD(total demand) and in the load curve calculations in the demand sector.

TSLOAD (ENDUSE,EC)**: Temperature Sensitive Fraction of Load** (Btu/Btu or J/J)

Most of the heating and air conditioning load is temperature sensitive but some may not be because of HVAC control system requirements. This fraction is taken from engineering studies

or utility data and is found in the *data files. TSLOAD is used in the calculation of DMD(total demand) and in the load curve calculations in the demand sector.

TSPOL (ES,POLL,YEAR)**:** **Energy Sector Pollution** (TONS/YR or TONNES/YR)

TSPOL is TFPOL summed over fuel. The calculation is found in the demand sector and it is used in the calculation of the societal cost of pollution(TRPC).

TSPOL (POLL,YEAR)**:** **Energy Sector Pollution** (TONS/YEAR)

Total pollution by pollution type is equal to the energy sector pollution (TFPOL) summed by fuel.

TSPOL (POLL,YEAR)**:** **Energy Sector Pollution** (TONS/YEAR)

Total pollution by pollution type is equal to the energy sector pollution (TFPOL) summed by fuel.

TSPOL (ES,POLL,YEAR)**:** **Energy Sector Pollution** (TONS/YR or TONNES/YR)

TSPOL is TFPOL summed over fuel. The calculation is found in the demand sector and it is used in the calculation of the societal cost of pollution(TRPC).

TUREV (YEAR)**:** **True Up Revenue** (M$)

True-up revenue is the difference between the allowed and actual revenues.

TUREV (YEAR)**:** **True Up Revenue** (M$)

True-up revenue is the difference between the allowed and actual revenues.

TUSW (YEAR)**:** **True Up Revenue Switch**

If this switch is on then true up revenues are added to allowed revenues.

TUSW (YEAR)**:** **True Up Revenue Switch**

If this switch is on then true up revenues are added to allowed revenues.

TXINC (YEAR)**:** **Taxable Income** (M$/YR)

Taxable income is calculated by subtracting the variable costs - fuel (TFC), operating and maintenance costs (TOMC), double declining depreciation (TDDDP), property and state tax (PTAX) and interest payments (DBIN) from revenue (REV) and other income (OTINC)

TXINC (YEAR)**:** **Taxable Income** (M$/YR)

Taxable income is calculated by subtracting the variable costs - fuel (TFC), operating and maintance costs (TOMC), double deciling depreciation (TDDDP), property and stat tax (PTAX) and interest payments (DBIN) from revenue (REV) and other income (OTINC)

TXRT (SECTOR)**: Tax Rate on Energy Consumer** (DLESS)

A policy variable used in pollution and conservation analyses.

TXRT (EC,YEAR)**: Tax Rate on Energy Consumer** ($/$)

The average Tax rate by economic sector(at a national level) can be obtained from the Statistical Abstract of the US(US Dept. of Commerce). Also see DEMAND81 Documentation(Backus, G. A., DEMAND81: National Energy Policy Model, School of Industrial Engineering, Purdue University, Reports AFC-7 through AFC-10, 1981). Current source for Personal Tax Rates: DRI, Tables 7 & 10. TXRT is used in the calculation of capital charge rates.

TXRT (SECTOR)**: Tax Rate on Energy Consumer** (DLESS)

A policy variable used in pollution and conservation analyses.

TXRT (EC,YEAR)**: Tax Rate on Energy Consumer** ($/$)

The average Tax rate by economic sector(at a national level) can be obtained from the Statistical Abstract of the US(US Dept. of Commerce). Also see DEMAND81 Documentation(Backus, G. A., DEMAND81: National Energy Policy Model, School of Industrial Engineering, Purdue University, Reports AFC-7 through AFC-10, 1981). Current source for Personal Tax Rates: DRI, Tables 7 & 10. TXRT is used in the calculation of capital charge rates.

TYCWAC (YEAR)**: Construction Work in Progress into Ratebase** (M$)

Total construction is the construction work in progress plus the AFUDC, summed over all construction levels.

TYCWAC (YEAR)**: Construction Work in Progress into Ratebase** (M$)

Total construction is the construction work in progress plus the AFUDC, summed over all construction levels.

TYFC (YEAR)**: Test Year Fuel Costs** (M$)

Test year fuel costs are the product of unit fuel costs times generation, summed over plant type.

TYFC (YEAR)**: Test Year Fuel Costs** (M$)

Test year fuel costs are the product of unit fuel costs times generation, summed over plant type.

TYITXRP (YEAR)**: Test Year Income Tax Reported** (M$)

Test year income taxes reported are calculated differently than in the normal year because the regulatory process does not use accelerated depreciation methods. Amortized tax credits are subtracted as usual. Deferred tax credits (DFITC) are replaced by claimed tax credits (CLCT) when there is flow through accounting (NMTC equals zero.) The deferred taxes from the AFC (AFDTX) term is replaced by a calculation using the test year values as TAXR*TYAFDB).

TYITXRP (YEAR)**: Test Year Income Tax Reported** (M$)

Test year income taxes reported are calculated differently than in the normal year because the regulatory process does not use accelerated depreciation methods. Amortized tax credits are subtracted as usual. Deferred tax credits (DFITC) are replaced by claimed tax credits (CLCT) when there is flow through accounting (NMTC equals zero.) The deferred taxes from the AFC (AFDTX) term is replaced by a calculation using the test year values as TAXR*TYAFDB).

TYNTINC (YEAR)**: Test Year Net Income** (M$)

Test year net income is calculated in an identical fashion as the normal year calculations except that the test year values are used. See NTINC.

TYNTINC (YEAR)**: Test Year Net Income** (M$)

Test year net income is calculated in an identical fashion as the normal year calculations except that the test year values are used. See NTINC.

TYOMC (YEAR)**: Test Year O&M Costs** (M$)

Test year O&M costs are the sum of operations and maintenance costs and decommissioning costs from the test year simulation.

TYOMC (YEAR)**: Test Year O&M Costs** (M$)

Test year O&M costs are the sum of operations and maintenance costs and decommisssioning costs from the test year simulation.

TYOPINC (YEAR)**: Test Year Operating Income** (M$)

Test year operating income is calculated in an identical fashion as the normal year calculations except that the test year values are used. See OPINC.

TYOPINC (YEAR)**: Test Year Operating Income** (M$)

Test year operating income is calculated in an identical fashion as the normal year calculations except that the test year values are used. See OPINC.

TYPUCT (YEAR)**: Test Year Purchased Power Costs** (M$)

The value for test year purchase power comes directly from the test year simulation of PUCT.

TYPUCT (YEAR)**: Test Year Purchased Power Costs** (M$)

The value for test year purchase power comes directly from the test year simulation of PUCT.

TYRBADD (AA,YEAR)**: Test Year Rate Base Additions** (M$)

Net additions to the rate-base are calculated by summing the amounts of construction work in progress and AFC for all plants to be completed before or during the year plus all the capital additions to existing capacity (GCAD), t&D construction (TDTBF) and miscellaneous projects (MISCGA).

TYRBADD (AA,YEAR)**: Test Year Rate Base Additions** (M$)

Net additions to the rate-base are calculated by summing the amounts of construction work in progress and AFC for all plants to be completed before or during the year plus all the capital additions to existing capacity (GCAD), T&D construction (TDTBF) and miscellaneous projects (MISCGA).

TYREV (YEAR)**: Test Year Revenue** (M$)

Test year revenues use test year sales but add a correction for assumed fuel clause adjustments. This adjustment is in the form of a difference between test year and current year fuel costs.

TYREV (YEAR)**: Test Year Revenue** (M$)

Test year revenues use test year sales but add a correction for assumed fuel clause adjustments. This adjustment is in the form of a difference between test year and current year fuel costs.

TYSALES (RTCLASS,YEAR)**: Test Year Electricity Sales** (GWH/YR)

Forecasted sales for next year used to determine revenue requirements. Calculated in the testyear procedure in the electric sector.

TYSALES (RTCLASS,YEAR)**: Test Year Electricity Sales** (gWh/YR)

Forecasted sales for next year used to determine revenue requirements. Calculated in the test year procedure in the electric sector.

TYSLDC (MONTH,YEAR)**: Test Yr. Peak Demand before Losses** (MW)

Future class peaks by season are extrapolated in the forecasting section and are summed over class to obtain the system peak by season (TYSLDC). This term is used to allocate test year operating costs.

TYSLDC (MONTH,YEAR)**: Test Yr. Peak Demand before Losses** (MW)

Future class peaks by season are extrapolated in the forecasting section and are summed over class to obtain the system peak by season (TYSLDC). This term is used to allocate test year operating costs.

TYTSALE (YEAR)**: Test Year Electricity Sales** (gWh/YR)

Next year's total sales are calculated by summing over class next years total sales by class.

TYTSALE (YEAR)**: Test Year Electricity Sales** (GWH/YR)

Next year's total sales are calculated by summing over class next years total sales by class.

UCPP : Unit Cost of Purchased Power

The amount of purchased power is calculated in the generation and dispatch portion of the model. The cost of purchased power is endogenously estimated as an energy cost plus a wheeling charge. The energy cost is calculated as the average of the fuel costs the utility would incur it produced the power from its next available plant type and the fuel cost from the next cheaper plant type available on the grid. The fuel costs from the "grid plant" are assumed to have the same fuel costs as the previously dispatched plant type of the purchasing utility.

UCPP : Unit Cost of Purchased Power

The amount of purchased power is calculated in the generation and dispatch portion of the model. The cost of purchased power is endogenously estimated as an energy cost plus a wheeling charge. The energy cost is calculated as the average of the fuel costs the utility would incur it produced the power from its next available plant type and the fuel cost from the next cheaper plant type available on the grid. The fuel costs from the "grid plant" are assumed to have the same fuel costs as the previously dispatched plant type of the purchasing utility.

UEX (SECTOR,FUEL,YEAR)**: Expenditures for Participant**

Capital expenditures for program participants(UEX) are calculated from both new and retrofitted process capital and device costs in the DSM post processing procedure in the demand sector.

UEX (SECTOR,FUEL,YEAR)**: Expenditures for Participant**

Capital expenditures for program participants(UEX) are calculated from both new and retrofitted process capital and device costs in the DSM post processing procedure in the demand sector.

UFC (PLANT,YEAR)**: Unit Fuel Cost** (MILLS/kWh)

The unit fuel cost for generation is the cost of primary fuel (in mills/kW) times the average heat rate.

UFC (PLANT,YEAR)**: Unit Fuel Cost** (MILLS/kWh)

The unit fuel cost for generation is the cost of primary fuel (in mills/kW) times the average heat rate.

UFOMC (PLANT,YEAR)**: Unit Fixed O&M Costs** (M$/YR)

Unit Fixed O&M costs are exogenously specified and are multiplied by the generation capacity to calculate the fixed cost component of total O&M costs.

UFOMC (PLANT,YEAR)**: Unit Fixed O&M Costs** (M$/YR)

Unit Fixed O&M costs are exogenously specified and are mulitiplied by the generation capacity to calculate the fixed cost component of total O&M costs.

UGAOM (YEAR)**: Unit General and Admin. O&M Costs** (MILLS/kWh)

An exogenously specified input variable used in the calculation of total general and administrative costs.

UGAOM (YEAR)**: Unit General and Admin. O&M Costs** (MILLS/kWh)

An exogenously specified input variable used in the calculation of total general and administrative costs.

UINC (SECTOR,FUEL,YEAR)**: Incentives for Participant**

UINC is the value of incentives to a participant in a program. It is computed as the value of a rebate(DCCU or PCCU) plus the value of a low interest loan ((DCCP*(1-DCCRU/DCCR) or PCCP*(1-PCCRU/PCCR)] times the level of energy additions(UDA or UPA).

UINC (SECTOR,FUEL,YEAR)**: Incentives for Participant**

UINC is the value of incentives to a participant in a program. It is computed as the value of a rebate(DCCU or PCCU) plus the value of a low interest loan ((DCCP*(1-DCCRU/DCCR) or PCCP*(1-PCCRU/PCCR)] times the level of energy additions(UDA or UPA).

UMEA (SECTOR)**: Unit of Measure for Participant**

The Unit of Measure is used in the DSM post-processing routine and is calculated in SDATA differently for the participants in each sector.   The Residential Measure, Income per Household, is residential income divided by the number of residential customers in 1988, deflated to 1975$. The Commercial Measure is Income per 1000 sq. ft. deflated to 1975$. The Industrial Measure is simply dollars of output. This variable is used to calcuate the fuel cost to a participant the program(URV) by weighting the product of the participant demand level times the fuel price.

UMEA (SECTOR)**: Unit of Measure for Participant**

The Unit of Measure is used in the DSM post-processing routine and is calculated in SDATA differently for the participants in each sector. The Residential Measure, Income per Household, is residential income divided by the number of residential customers in 1988, deflated to 1975$. The Commercial Measure is Income per 1000 sq. ft. deflated to 1975$. The Industrial Measure is simply dollars of output. This variable is used to calculate the fuel cost to a participant the program(URV) by weighting the product of the participant demand level times the fuel price.

UMS (ENDUSE,TECH,EC,YEAR)**: Utility Multiplier for Short Term Price Response** (Btu/Btu or J/J)

The Utility Multiplier for Short Term Price Response(UMS) is the short term budget response that operates in response to higher fuel prices. As energy prices rise, consumers struggle to keep within their budgets. They do this by attempting to maintain the same dollar shares of the goods and services they desire. Therefore, they must cut back on their energy consumption. Since their standard of living is affected by these behaviors, they will attempt to return to their previous standard as quickly as possible. The budget response, then, is a short term response that gives way to long term changes in behavior and is determined by fuel prices(which force the consumer to construct a new budget

UMS (ENDUSE,TECH,EC,YEAR)**: Utility Multiplier for Short Term Price Response** (Btu/Btu or J/J)

The Utility Multiplier for Short Term Price Response(UMS) is the short term budget response that operates in response to higher fuel prices. As energy prices rise, consumers struggle to keep within their budgets. They do this by attempting to maintain the same dollar shares of the goods and services they desire. Therefore, they must cut back on their energy consumption. Since their standard of living is affected by these behaviors, they will attempt to return to their previous standard as quickly as possible. The budget response, then, is a short term response that gives way to long term changes in behavior and is determined by fuel prices(which force the consumer to construct a new budget

UOM (SECTOR,FUEL,YEAR)**: Operation/Maintenance Costs for Participant**

The present value of O&M costs for program participants(UOM) are derived in the DSM postprocessing procedure in the demand sector from the costs to operate and maintain both the device and the process capital, both new and retrofitted.

UOM (SECTOR,FUEL,YEAR)**: Operation/Maintenance Costs for Participant**

The present value of O&M costs for program participants(UOM) are derived in the DSM postprocessing procedure in the demand sector from the costs to operate and maintain both the device and the process capital, both new and retrofitted.

UOMC (PLANT,YEAR)**: Unit O&M Cost** (MILLS/kWh)

Unit O&M costs are exogenously specified and are mulitiplied by total generation to calculate the variable cost component of total O&M costs.

UOMC (PLANT,YEAR)**: Unit O&M Cost** (MILLS/kWh)

Unit O&M costs are exogenously specified and are multiplied by total generation to calculate the variable cost component of total O&M costs.

UOR (PLANT,YEAR)**: Unscheduled Outage Rate** (Fraction)

The unsceduled outage rate is a calibrated variable used in the calculation of the plant availability factor that determines effective generating capacity.

UOR (PLANT,YEAR)**: Unscheduled Outage Rate** (Fraction)

The unscheduled outage rate is a calibrated variable used in the calculation of the plant availability factor that determines effective generating capacity.

URV (SECTOR,FUEL,YEAR)**: Fuel Costs for Participant**

As calculated in the DSM post processing procedure, fuel costs for the participant is determined by the users level of demand and the local fuel price.

URV (SECTOR,FUEL,YEAR)**: Fuel Costs for Participant**

As calculated in the DSM post processing procedure, fuel costs for the participant is determined by the users level of demand and the local fuel price.

USMT (HORIZON)**: Smoothing Time** (Year)

An exogenously specified smoothing variable used in the demand extrapolation process.

USMT (HORIZON)**: Smoothing Time** (Year)

An exogenously specified smoothing variable used in the demand extrapolation process.

UST : Short-term Smoothing Time (Year)

An exogenously specified smoothing variable used in the demand extrapolation process.

UST : Short-term Smoothing Time (Year)

An exogenously specified smoothing variable used in the demand extrapolation process.

WCC (YEAR)**: Weighted Cost of Capital** (1/YR)

The wieghted cost of capital is the ratio of interest payments, preferred stock dividends and return on equity to the amount of debt, equity and deferred teaxes and tax credits. The weighted cost of capital is used for regulatory matters and in the determination of AFC.

WCC (YEAR)**: Weighted Cost of Capital** (1/YR)

The weighted cost of capital is the ratio of interest payments, preferred stock dividends and return on equity to the amount of debt, equity and deferred taxes and tax credits. The weighted cost of capital is used for regulatory matters and in the determination of AFC.

WCCTX (YEAR)**: Weighted Cost of Capital including Tax** (1/YR)

This is a pseudo after tax weighted cost of capital. It is the increase in revenue requirements needed to maintain the nominal allowed rate of return. The equation is similar to WCC except that the tax term is included in the denominator of the equation. Since this term is a fraction less than one, WCCTX will be greater than WCC.

WCCTX (YEAR)**: Weighted Cost of Capital including Tax** (1/YR)

This is a pseudo after tax weighted cost of capital. It is the increase in revenue requirements needed to maintain the nominal allowed rate of return. The equation is similar to WCC except that the tax term is included in the denominator of the equation. Since this term is a fraction less than one, WCCTX will be greater than WCC.

WCUF (EC)**: Capacity Utilization Factor Weighted by Output**

This economic capacity utilization factor is the same as ECUF, used before when describing factors influencing final demand. Here, it is mapped to another variable name WCUF, and performs exactly the same function for cogeneration. If a plant is only running one shift, the cogeneration facility will be available only one third of the time; if three shifts are operating, cogeneration can occur around the clock. The variable is calibrated and it affects the amount of available cogeneration. All calculations are performed in the demand sector.

WCUF (EC)**: Capacity Utilization Factor Weighted by Output**

This economic capacity utilization factor is the same as ECUF, used before when describing factors influencing final demand. Here, it is mapped to another variable name WCUF, and performs exactly the same function for cogeneration. If a plant is only running one shift, the

cogeneration facility will be available only one third of the time; if three shifts are operating, cogeneration can occur around the clock. The variable is calibrated and it affects the amount of available cogeneration. All calculations are performed in the demand sector.

WORKCAP (YEAR)**: Working Capital** (M$)

Working capital represents cash needs to cover fuel and operation and maintenance costs. Working capital associated with conventional fuels reflects the carrying cost of inventory. If the inventory were, on average, equivalent to six weeks of fuel use, the fraction (FFCRB) of total fuel costs considered as working capital would be 6/52 of a year. There is a similar fraction (FOMRB) for operation and maintenance costs.

WORKCAP (YEAR)**: Working Capital** (M$)

Working capital represents cash needs to cover fuel and operation and maintenance costs. Working capital associated with conventional fuels reflects the carrying cost of inventory. If the inventory were, on average, equivalent to six weeks of fuel use, the fraction (FFCRB) of total fuel costs considered as working capital would be 6/52 of a year. There is a similar fraction (FOMRB) for operation and maintenance costs.

WSRATIO (PLANT)**: Winter to Summer Capacity Ratio** (Frac)

The winter to summer ratio captures the different plant availabilities by season. It is an exogenously specified variable.

WSRATIO (PLANT)**: Winter to Summer Capacity Ratio** (Frac)

The winter to summer ratio captures the different plant availabilities by season. It is an exogenously specified variable.

XACDP (AA,YEAR)**: Historical Accumulated Depreciation** (M$)

Source: FERC#1 - "Accumulated Provision for Depreciation of Electric Utility Plant", pg. 408-409 (1980), pg. 213 (1981-1984), pg. 219 (1985-1993). column (b) "Total". Generation equals steam production plus other production.

XACDP (AA,YEAR)**: Historical Accumulated Depreciation** (M$)

Source: FERC#1 - "Accumulated Provision for Depreciation of Electric Utility Plant", pg. 408-409 (1980), pg. 213 (1981-1984), pg. 219 (1985-1993). column (b) "Total". Generation equals steam production plus other production.

XACDPT (YEAR)**: Historical Total Accumulated Depreciation** (M$)

This is the sum of accumulated depreciation (XACDP) across all asset accounts.

XACDPT (YEAR)**: Historical Total Accumulated Depreciation** (M$)

This is the sum of accumulated depreciation (XACDP) across all asset accounts.

XADTC (YEAR)**: Historical Accumulated Deferred Invest. Tax Credits** (M$)

Deferred Investment Tax Credits equals claimed tax credits under normalized accounting. Accumulated credits are the sum of these claimed tax credits over time. They can be found in the FERC #1 accounts.

XADTX (YEAR)**: Accumulated Deferred Income Tax**

Accumulated deferred income taxes can be found in FERC #1 accounts.

XAFDB (YEAR)**: Historical Allowance for Borrowed Funds** (M$)

Source: FERC #1 Statement of Income (1980) page 116a, line 56; (1981-1992) page 117, line 59; and (1993) page 117, line 63.

XAFDB (YEAR)**: Historical Allowance for Borrowed Funds** (M$)

Source: FERC #1 Statement of Income (1980) page 116a, line 56; (1981-1992) page 117, line 59; and (1993) page 117, line 63.

XAFEQ (YEAR)**: Historical Allowance for Equity Funds** (M$)

Source: FERC #1 Statement of Income (1980) page 116a, line 28; (1981-1992) page 117, line 32; and (1993) page 117, line 36.

XAFEQ (YEAR)**: Historical Allowance for Equity Funds** (M$)

Source: FERC #1 Statement of Income (1980) page 116a, line 28; (1981-1992) page 117, line 32; and (1993) page 117, line 36.

XAGC (YEAR)**: Administrative & General Expenses** (M$)

Source: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 420, column (b); (1981-1992), page 323, column (b); line 167 "Total Administrative and General Expenses" and (1993), page 323, column (b), line 168 "Total Administrative and General Expenses."

XAGC (YEAR)**: Administrative & General Expenses** (M$)

Source: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 420, column (b); (1981-1992), page 323, column (b); line 167 "Total Administrative and General Expenses" and (1993), page 323, column (b), line 168 "Total Administrative and General Expenses."

XAROE (YEAR)**: Historical Allowed Return on Common Equity**

A user specified variable from utility or regulatory sources. Default specification is 12%.

XAROE (YEAR)**: Historical Allowed Return on Common Equity**

A user specified variable from utility or regulatory sources. Default specification is 12%.

XBMSF (ENDUSE,TECH,EC,YEAR)**: Budget Market Share Fraction by Device** ($/$)

The Budget Market Share Fraction by Device(BMSF) represents the dollars spent on energy for each device for each EC and each fuel. It is the fraction of the budget that the consumer expects to spend for using each device. It performs the same function as the endogenously determined BMSF but is used when user prefers an exogenous specification. It should include both a capital and a variable cost component.

XBMSF (ENDUSE,TECH,EC,YEAR)**: Budget Market Share Fraction by Device** ($/$)

The Budget Market Share Fraction by Device(BMSF) represents the dollars spent on energy for each device for each EC and each fuel. It is the fraction of the budget that the consumer expects to spend for using each device. It performs the same function as the endogenously determined BMSF but is used when user prefers an exogenous specification. It should include both a capital and a variable cost component.

XCAC (YEAR)**: Customer Accounts Expenses** (M$)

Source: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 419, column (b); (1981-1992), page 322, column (b); line 163 "Total Customer Accounts Expenses" and (1993), page 322, column (b), line 134 "Total Customer Accounts expenses

XCAC (YEAR)**: Customer Accounts Expenses** (M$)

Source: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 419, column (b); (1981-1992), page 322, column (b); line 163 "Total Customer Accounts Expenses" and (1993), page 322, column (b), line 134 "Total Customer Accounts expenses

XCCMS (YEAR)**: Transportation Market Share** (Frac)

The transportation market share is the exogenously determined fraction of gas throughput on an LDC distribution system. It is used to calculate CCSALES - the transportation gas sales. This fraction utility specific and can be derived from individual utility data by comparing the ratio of transportation sales to total throughput.

XCCMS (YEAR)**: Transportation Market Share** (Frac)

The transportation market share is the exogenously determined fraction of gas throughput on an LDC distribution system. It is used to calculate CCSALES - the transportion gas sales. This fraction utility specific and can be derived from individual utility data by comparing the ratio of transportation sales to total throughput.

XCGDMD (TECH,EC,YEAR)**: Exogenous Cogeneration** (tBtu/YR or PJ/YR)

Historical cogeneration demands are usually determined with utility or region specific data. This data is described and documented in the *data files. XCGDMD is added to XDMD to get XECD.

XCGDMD (TECH,EC,YEAR)**: Exogenous Cogeneration** (tBtu/YR or PJ/YR)

Historical cogeneration demands are usually determined with utility or region specific data. This data is described and documented in the *data files. XCGDMD is added to XDMD to get XECD.

XCGMSF (TECH,EC,YEAR)**: Exogenous Cogeneration Market Share** ($/$)

The cogeneration mareket share is used to determine the fraction of cogeneration potential(CGPOT) that is actually developed. It is analogous to CGMSF except here it is exogenously specified by the user.

XCGMSF (TECH,EC,YEAR)**: Exogenous Cogeneration Market Share** ($/$)

The cogeneration market share is used to determine the fraction of cogeneration potential(CGPOT) that is actually developed. It is analogous to CGMSF except here it is exogenously specified by the user.

XCMSF (ENDUSE,TECH,CTECH,EC,YEAR)**: Conversion Market Share by Device** ($/$)

Performs the same function as CMSF but is exogenously specified by the user.

XCMSF (ENDUSE,TECH,CTECH,EC,YEAR)**: Conversion Market Share by Device** ($/$)

Performs the same function as CMSF but is exogenously specified by the user.

XCONCAP (SECTOR,YEAR)**: Exogenous Capitalized Conservation Expenses** (M$/YEAR)

An exogenously specified override of the calculated CONCAP in the model. Used in the same fashion as CONCAP.

XCONCAP (SECTOR,YEAR)**: Exogenous Capitalized Conservation Expenses** (M$/YEAR)

An exogenously specified override of the calculated CONCAP in the model. Used in the same fashion as CONCAP.

XCONEXP (SECTOR,YEAR)**: Exogenous Conservation Expenses** (M$/YEAR)

An exogenously specified override of the calculated CONEXP in the model. Used in the same fashion as CONEXP.

XCONEXP (SECTOR,YEAR)**: Exogenous Conservation Expenses** (M$/YEAR)

An exogenously specified override of the calculated CONEXP in the model. Used in the same fashion as CONEXP.

XCSC (YEAR)**: Historical Customer Service Costs** ($M)

Source: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 419, column (b); (1981-1992), page 322, column (b); line 140 "Total Customer Service and Informational Expenses" and (1993), page 322, column (b), line 141 "Total Customer Service and Informational Expenses."

XCSC (YEAR)**: Historical Customer Service Costs** ($M)

Source: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 419, column (b); (1981-1992), page 322, column (b); line 140 "Total Customer Service and Informational Expenses" and (1993), page 322, column (b), line 141 "Total Customer Service and Informational Expenses."

XCSDI (YEAR)**: Historical Common Stock Dividends Re-invested** (M$/YR)

Source: FERC #1 Notes to Financial Statements, pages 123 B or A; line "Dividend Reinvestment and Stock Purchase Plan." Premium and par value are added.

XCSDI (YEAR)**: Historical Common Stock Dividends Re-invested** (M$/YR)

Source: FERC #1 Notets to Financial Statements, pages 123 B or A; line "Dividend Reinvestment and Stock Purchase Plan." Premium and par value are added.

XCSDR (YEAR)**: Common Stock Dividend Rate** ($/SHARE/YR)

The dividend rate is based on dividends and the number of shares outstanding in the previous year plus new shares sould. It is calculated in EDATA from dividends divided shares outstanding minus shares sold all multiplied by the dividend fraction.

XCSDR (YEAR)**: Common Stock Dividend Rate** ($/SHARE/YR)

The dividend rate is based on dividends and the number of shares outstanding in the previous year plus new shares sold. It is calculated in EDATA from dividends divided shares outstanding minus shares sold all multiplied by the dividend fraction.

XCSDV (YEAR)**:   Historical Common Stock Dividends** (M$/YR)

Source: FERC #1 Statement of Retained Earnings (1980), page 117, line 36; (1981-1993), page 118, line 36.

XCSDV (YEAR)**:   Historical Common Stock Dividends** (M$/YR)

Source: FERC #1 Statement of Retained Earnings (1980), page 117, line 36; (1981-1993), page 118, line 36.

XCSEQ (YEAR)**:   Histroical Common Stock Equity** (M$/YR)

Source: FERC #1 Comparative Balance Sheet (1980), page 111, line 13; (1981-1993), page 112, line 14.

XCSEQ (YEAR)**:   Historical Common Stock Equity** (M$/YR)

Source: FERC #1 Comparative Balance Sheet (1980), page 111, line 13; (1981-1993), page 112, line 14.

XCSFD (YEAR)**:   Historical Funds from Common Stock** (M$/YR)

Source: FERC #1 - "Statement of Changes in Financial Position" - (1980), pages 118-119, (1981-1993), pages 120-121. line "Funds from Outside Sources: "Common Stock"

XCSFD (YEAR)**:   Historical Funds from Common Stock** (M$/YR)

Source: FERC #1 - "Statement of Changes in Financial Position" - (1980), pages 118-119, (1981-1993), pages 120-121. line "Funds from Outside Sources: "Common Stock"

XCSMB (YEAR)**:   CS Market to Book Value Ratio** (DLESS)

This ratio is calculated by dividing the CS market value (XCSFD (funds) plus XCSDI (dividends invest) divided by XCSSS (shares sold) by the book value ((XCSTL+XRE)/XCSSO).

XCSMV (YEAR)**:   CS Market Value** ($/Share)

CS market value is calculated in EDATA by adding XCSFD (funds) and XCSDI (dividends invested) and dividing by XCSSS (shares sold. In the initial year market value is set equal to book value (XCSTL+XRE)/(XCSSO).

XCSMV (YEAR)**:   CS Market Value** ($/Share)

CS market value is calculated in EDATA by adding XCSFD (funds) and XCSDI (dividends invested) and dividing by XCSSS (shares sold. In the initial year market value is set equal to book value (XCSTL+XRE)/(XCSSO).

XCSPU (YEAR)**: Historical Common Stock Repurchased** (M$/YR)

Source: FERC #1 Capital Stock, page 251, line 2.

XCSPU (YEAR)**: Historical Common Stock Repurchased** (M$/YR)

Source: FERC #1 Capital Stock, page 251, line 2.

XCSSO (YEAR)**: Historical CS Shares Outstanding** ($M)

Source: FERC #1 Capital Stock - (1980), page 215, line 1; (198101993), page 251, line 1, column e.

XCSSO (YEAR)**: Historical CS Shares Outstanding** ($M)

Source: FERC #1 Capital Stock - (1980), page 215, line 1; (198101993), page 251, line 1, column e.

XCSSS (YEAR)**: Historical Common Stock Shares Sold** ($M)

These values are calculated in EDATA by subtracting XCSSO last period from XCSSO this period.

XCSSS (YEAR)**: Historical Common Stock Shares Sold** ($M)

These values are calculated in EDATA by subtracting XCSSO last period from XCSSO this period.

XCSTK (YEAR)**: Historical Common Stock** (M$)

Source: FERC #1 Comparative Balance Sheet (1980), page 111, line 1; (1981-1993), page 112, line 2.

XCSTK (YEAR)**: Historical Common Stock** (M$)

Source: FERC #1 Comparative Balance Sheet (1980), page 111, line 1; (1981-1993), page 112, line 2.

XCWIP (YEAR)**: Historical Construction Work in Progress** ($M)

Source: FERC #1 Comparative Balance Sheet, page 110, line 3.

XCWIP (YEAR)**: Historical Construction Work in Progress** ($M)

Source: FERC #1 Comparative Balance Sheet, page 110, line 3.

XDB (YEAR)**: Historical Long Term Debt** (M$)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). Some years do not match the FERC #1 (Comparative Balance Sheet, page 112, line 22) because some long term debt has matured.

XDB (YEAR)**: Historical Long Term Debt** (M$)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). Some years do not match the FERC #1 (Comparative Balance Sheet, page 112, line 22) because some long term debt has matured.

XDBFD (YEAR)**: Historical New Debt** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). .

XDBFD (YEAR)**: Historical New Debt** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). .

XDBIN (YEAR)**: Historical Debt Interest on LT Debt** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). Some years do not match the FERC #1 (Comparative Balance Sheet, page 112, line 22) because some long term debt has matured.

XDBIN (YEAR)**: Historical Debt Interest on LT Debt** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). Some years do not match the FERC #1 (Comparative Balance Sheet, page 112, line 22) because some long term debt has matured.

XDBIR (YEAR)**: Historical New Debt Interest Rate** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). .

XDBIR (YEAR)**: Historical New Debt Interest Rate** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). .

XDBNIN (YEAR)**: Historical New Debt Interest Obligations** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). .

XDBNIN (YEAR)**: Historical New Debt Interest Obligations** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). .

XDBNIP (YEAR)**: Historical Interest Paid on New Debt** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257.

XDBRIN (YEAR)**: Historical Interest on Debt Repaid** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). .

XDBRIN (YEAR)**: Historical Interest on Debt Repaid** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). .

XDBRP (YEAR)**: Historical Debt Repaid** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). .

XDBRP (YEAR)**: Historical Debt Repaid** (M$/YR)

Calculated from FERC #1 Long Term Debt Account, page 257, column "Outstanding" (h). .

XDCAC (YEAR)**: Historical Decommission Cost Accumulated** (M$)

These costs are found in FERC #1, page 219 insert sheets detailing depreciation costs. The total is obtained by adding together each year's contribution.

XDCAC (YEAR)**: Historical Decommission Cost Accumulated** (M$)

These costs are found in FERC #1, page 219 insert sheets detailing depreciation costs. The total is obtained by adding together each year's contribution.

XDCC (ENDUSE,TECH,EC,YEAR)**: Device Capital Cost** ($/(mBtu/YR) or $/(GJ/YR))

Initial Capital Costs are from ARC 80($75/Mbtu) and EPRI EA-433 V2, p. 3-64. Gas Air Conditioner capital costs are from AGA's, May 26, 1989(EA-1989-S), Energy Analysis "An Analysis of the Economies of Gas Engines-Driven Chillers". LPG air conditioning capital cost is set equal to Gas. Some customer specific data overrides these choices; also a variety of sources is used for alternative technology capital costs. All data is located in the *data files.

XDCC (ENDUSE,TECH,EC,YEAR)**: Device Capital Cost** ($/(mBtu/YR) or $/(GJ/YR))

Initial Capital Costs are from ARC 80($75/Mbtu) and EPRI EA-433 V2, p. 3-64. Gas Air Conditioner capital costs are from AGA's, May 26, 1989(EA-1989-S), Energy Analysis "An Analysis of the Economies of Gas Engines-Driven Chillers". LPG air conditioning capital cost is set equal to Gas. Some customer specific data overrides these choices; also a variety of sources is used for alternative technology capital costs. All data is located in the *data files.

XDEE (ENDUSE,TECH,EC,YEAR)**: Historical Device Efficiency** (Btu/Btu or J/J)

The source for the Initial Device Efficiencies in 1972 are from ARC 80, except gas A/C which uses data from AGA, May 26, 1989(EA-1989-S), "Energy Analysis: An Analysis of the Economies of Gas Engines-Driven Chillers". Device efficiencies for LPG are set equal to GAS efficiencies. National and regional data is used to derive these historical efficiencies - the specific sources are listed in the *data files. Utility specific data is preferred; default data is regional. The DEMM(Technological Improvements in Devices) is calibrated from the XDEEs.

XDEE (ENDUSE,TECH,EC,YEAR)**: Historical Device Efficiency** (Btu/Btu or J/J)

The device efficiency is the ratio of the amount of fuel or input energy required per unit of process or output energy produced. For example, if a water heater produces y PJ of hot water during a year and requires x PJ of electricity, the device efficiency is y/x PJ/PJ. The device efficiency is developed by dividing the output energy by the input of fuel usage of an appliance. The difficulty is translating standard measures of appliance output (i.e. lumens) into energy units (PJ). However, engineering studies are generally available for doing these computations.The source for the Initial Device Efficiencies in 1972 are from "Annual Report to Congress, 1980" (ARC) 80, except gas A/C which uses data from AGA, May 26, 1989(EA-1989-S), "Energy Analysis: An Analysis of the Economies of Gas Engines-Driven Chillers". Device efficiencies for LPG are set equal to GAS efficiencies. National and regional data is used to derive these historical efficiencies - the specific sources are listed in the *data files. Utility specific data is preferred; default data is regional. The DEMM(Technological Improvements in Devices) is calibrated from the XDEEs.

XDEER (ENDUSE,TECH,EC,YEAR)**: Exogenous Policy Participation Response** (Btu/Btu or J/J)

Exogenous DEER values if available can override the model-calculated DEER if the user desires.

XDEER (ENDUSE,TECH,EC,YEAR)**: Exogenous Policy Participation Response** (Btu/Btu or J/J)

Exogenous DEER values if available can override the model-calculated DEER if the user desires.

XDMD (ENDUSE,TECH,EC,YEAR)**: Exogenous Historical Energy Demands** (tBtu/YR or PJ/YR)

Calculated in *DATA files, XDMD is sales by fuel and enduse for each EConomic class. A variety of data sources are used for gross demand numbers and to split demand by EC, fuel and enduse. SEDS data is often a starting point, often cross-checked with utility data. Utility, national and regional data, the more site specific preferred, are used to split the totals. Each XDMD set is uniquely developed in the *DATA.file. Demand simulated by the model is calibrated to the XDMD data set.

XDMD (ENDUSE,TECH,EC,YEAR)**: Exogenous Historical Energy Demands** (tBtu/YR or PJ/YR)

Calculated in *DATA files, XDMD is sales by fuel and enduse for each economic class. A variety of data sources are used for gross demand numbers and to split demand by ec, fuel and enduse. SEDS data is often a starting point, often cross-checked with utility data. Utility, national and regional data, the more site specific preferred, are used to split the totals. Each XDMD set is uniquely developed in the *DATA.file. Demand simulated by the model is calibrated to the XDMD data set.

XECD (TECH,EC,YEAR)**: Historical Sector Fuel Demand** (tBtu/YR or PJ/YR)

This calculation is made in the *data files. It is the XDMD plus any cogeneration and feedstock demands summed to the sector level.

XECD (TECH,EC,YEAR)**: Historical Sector Fuel Demand** (tBtu/YR or PJ/YR)

This calculation is made in the *data files. It is the XDMD plus any cogeneration and feedstock demands summed to the sector level.

XEG (PLANT,YEAR)**: Historical Generation** (GWH)

Source: FERC #1 - "Electric Energy Account", (1980), page 431; (1981-1993), page 401. All steam production is oil. All other production is combusition turbine.

XEG (PLANT,YEAR)**: Historical Generation** (gWh)

Source: FERC #1 - "Electric Energy Account", (1980), page 431; (1981-1993), page 401. All steam production is oil. All other production is combustion turbine.

XEUDMD (PLANT,YEAR)**: Historical Utility Fuel Demand** (tBtu/YR)

XEUDMD is historical utility fuel emand across fuels by plant. The demand for each fuel by plant (in "natural" units such as barrels) is found in the plant data in FERC #1. These natural units are then converted to tBtu and summed across plant. For example, to calculate the fuel usage of a coal plant using oil to start, oil and coal demand (in barrels and tons, respectively) would be converted to tBtus and summed.

XFADP (YEAR)**: ADP of "Control Forecast,"** (MW/YR)

For historical calibration and if an exogenous forecast is to be used XFADP is the variable for the value of the control forecast's average demand for power.

XFADP (YEAR)**: ADP of "Control Forecast,"** (MW/YR)

For historical calibration and if an exogenous forecast is to be used XFADP is the variable for the value of the control forecast's average demand for power.

XFC (PLANT,YEAR)**: Historical Fuel Cost** (M$)

Source: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), page 417, line 5 for Oil; page 318, line 62 for Combustion Turbines; (1981-1993) for oil, page 320 line 5 "Steam Power Generation 501 Fuel" and (1981-1992) Combustion Turbine, page 321, line 62, "Other Power Generation 547 Fuel" and (1993) Combustion Turbine, page 321, line 63, "Other Power Generation 547 Fuel".

XFC (PLANT,YEAR)**: Historical Fuel Cost** (M$)

Source: FERC #1 - "Electric Operation and Maintenace Expenses" - (1980), page 417, line 5 for Oil; page 318, line 62 for Combustion Turbines; (1981-1993) for oil, page 320 line 5 "Steam Power Generation 501 Fuel" and (1981-1992) Combustion Turbine, page 321, line 62, "Other Power Generation 547 Fuel" and (1993) Combustion Turbine, page 321, line 63, "Other Power Generation 547 Fuel".

XFMDP (YEAR)**: MDP of "Control Forecast,"** (MW/YR)

For historical calibration and if an exogenous forecast is to be used XFMDP is the variable for the value of the control forecast's minimum demand for power.

XFMDP (YEAR)**: MDP of "Control Forecast,"** (MW/YR)

For historical calibration and if an exogenous forecast is to be used XFMDP is the variable for the value of the control forecast's minimum demand for power.

XFMSF (ENDUSE,TECH,CTECH,EC,YEAR)**: Fungible Market Share Fraction by Device** ($/$)

A user-specified input that overrides the endogenous calculation of fungible market shares by device in the fungible procedure in the demand sector. Values are customer specific from utility surveys and other similar studies.

XFMSF (ENDUSE,TECH,CTECH,EC,YEAR)**: Fungible Market Share Fraction by Device** ($/$)

A user-specified input that overrides the endogenous calculation of fungible market shares by device in the fungible procedure in the demand sector. Values are customer specific from utility surveys and other similar studies.

XFNRQ (YEAR)**:   Historical Financing Required** (M$)

Historical financing required is the sum of the financing required from the issuance of common and preferred stock and the intermediate and long term debt obligations.

XFNRQ (YEAR)**:   Historical Financing Required** (M$)

Historical financing required is the sum of the financing required from the issuance of common and preferred stock and the intermediate and long term debt obligations.

XFPDP (YEAR)**:   PDP of "Control Forecast,"** (MW/YR)

For historical calibration and if an exogenous forecast is to be used XFPDP is the variable for the value of the control forecast's peak demand for power.

XFPDP (YEAR)**:   PDP of "Control Forecast,"** (MW/YR)

For historical calibration and if an exogenous forecast is to be used XFPDP is the variable for the value of the control forecast's peak demand for power.

XFSDMD (TECH,EC,YEAR)**:   Feedstock Energy** (tBtu/YR or PJ/YR)

The default Feedstock Demands are a function of electricity use(ECDMD) including cogeneration and a national fraction(FEF). The calculations are performed in IDATA. Feedstock demand is added to demand and cogeneration demand to get total demand.

XFSDMD (TECH,EC,YEAR)**:   Feedstock Energy** (tBtu/YR or PJ/YR)

The default Feedstock Demands are a function of electricity use(ECDMD) including cogeneration and a national fraction(FEF). The calculations are performed in IDATA. Feedstock demand is added to demand and cogeneration demand to get total demand.

XGA (AA,YEAR)**:   Historical Gross Assets less Work in Progress** ($M)

Source: FERC #1 - "Electric Plant in Service," (1980), page 401-403; (1981-1984), page 202-204; and 1985-1993), page 204-207, all column (g) "Balance End of Year".

XGA (AA,YEAR)**:   Historical Gross Assets less Work in Progress** ($M)

Source: FERC #1 - "Electric Plant in Service," (1980), page 401-403; (1981-1984), page 202-204; and 1985-1993), page 204-207, all column (g) "Balance End of Year".

XGC (PLANT,YEAR)**: Historical Generation Capacity** (MW)

Source: FERC #1 - "Steam-Electric Generating Plant Statistics," (1980) pp. 432-432a, line 5; (1981-1993), pp. 402-403a, line 5; "Total Installed Capacity."

XGC (PLANT,YEAR)**: Historical Generation Capacacity** (MW)

Source: FERC #1 - "Steam-Electric Generating Plant Statistics," (1980) pp. 432-432a, line 5; (1981-1993), pp. 402-403a, line 5; "Total Installed Capacity."

XGCCC (PLANT,YEAR)**: Generation Capacity Capital Costs** ($/KW)

Generation capacity capital costs generally come from utility sources such as IRP capacity screening assessments or renewable resource assessments.

XGCCC (PLANT,YEAR)**: Generation Capacity Capital Costs** ($/KW)

Generation capacity capital costs generally come from utility sources such as IRP capacity screening assessments or renewable resource assessments.

XGCCI (PLANT,YEAR)**: Generation Capacity Initial Rate** (MW/YR)

This variable is used for exogenously specified plant construction. It can used in addition to, or in lieu of an endogenous building program.

XGCCI (PLANT,YEAR)**: Generation Capacity Initial Rate** (MW/YR)

This variable is used for exogenously specified plant construction. It can used in addition to, or in lieu of an endogenous building program.

XGCCOST (PLANT,YEAR)**: Historical Generating Capacity Capital Cost** ($/KW)

Source: FERC #1 - "Steam-Electric Generating Plant Statistics," (1980) pp. 432-432a, line 18; (1981-1993), pp. 402-403a, line 18; "Cost per kW of Installed Capacity."

XGCCOST (PLANT,YEAR)**: Historical Generating Capacity Capital Cost** ($/KW)

Source: FERC #1 - "Steam-Electric Generating Plant Statistics," (1980) pp. 432-432a, line 18; (1981-1993), pp. 402-403a, line 18; "Cost per kW of Installed Capacity."

XGCCR (PLANT,YEAR)**: Generation Capacity Construction Completion Rate** (MW/YR)

Any plant with an unique size or construction requirement can have an exogenously specified completion rate. Hydro plant completion rates are always exogenously specified.

XGCCR (PLANT,YEAR)**: Generation Capacity Construction Completion Rate** (MW/YR)

Any plant with an unique size or construction requirement can have an exogenously specified completion rate. Hydro plant completion rates are always exogenously specified.

XID (YEAR)**: Historical Intermediate Debt** (M$)

If a utility had intermediate debt historically, those values can be found in FERC #1.

XID (YEAR)**: Historical Intermediate Debt** (M$)

If a utility is had intermediate debt historically, those values can be found in FERC #1.

XIDFD (YEAR)**: Historical Funds from Intermediate Debt** (M$/YR)

If a utility is had intermediate debt historically, those values can be found in FERC #1.

XIDFD (YEAR)**: Historical Funds from Intermediate Debt** (M$/YR)

If a utility had intermediate debt historically, those values can be found in FERC #1.

XIDIN (YEAR)**: Historical Interest on Intermediate Debt** (M$/YR)

If a utility is had intermediate debt historically, those values can be found in FERC #1.

XIDIN (YEAR)**: Historical Interest on Intermediate Debt** (M$/YR)

If a utility is had intermediate debt historically, those values can be found in FERC #1.

XIDIR (YEAR)**: Historical Interest Rate Intermediate Debt** (M$/YR)

If a utility is had intermediate debt historically, those values can be found in FERC #1.

XIDIR (YEAR)**: Historical Interest Rate Intermediate Debt** (M$/YR)

If a utility is had intermediate debt historically, those values can be found in FERC #1.

XINPAY (YEAR)**: Historical Interest Paid** (M$)

Source: FERC #1 Statement of Income (1980), page 116a, line 57; (1981-1992), page 117, line 60; (11993), page 117, line 64. The interest paid is the difference between the total interest expenses and the AFUDC from debt.

XINPAY (YEAR)**: Historical Interest Paid** (M$)

Source: FERC #1 Statement of Income (1980), page 116a, line 57; (1981-1992), page 117, line 60; (11993), page 117, line 64. The interest paid is the difference between the total interest expenses and the AFUDC from debt.

XITXRP (YEAR)**: Historical Income Tax Reported** (M$/YR)

Source: FERC #1 - "Statement of Income for the Year", page 114 , lines 11 and 12 - "Income Taxes" plus lines 14 and 15 - "Income Taxes" equal Federal plus other taxes.

XITXRP (YEAR)**: Historical Income Tax Reported** (M$/YR)

Source: FERC #1 - "Statement of Income for the Year", page 114 , lines 11 and 12 - "Income Taxes" plus lines 14 and 15 - "Income Taxes" equal Federal plus other taxes.

XLMCAP (ENDUSE,YEAR)**: Load Management Capitalized** (M$)

A user-specified policy variable defining the dollar amount of load management to be capitalized(subject to rate of return).

XLMCAP (ENDUSE,YEAR)**: Load Management Capitalized** (M$)

A user-specified policy variable defining the dollar amount of load management to be capitalized(subject to rate of return).

XLMEXP (ENDUSE,YEAR)**: Load Management Expensed** (M$)

A user-specified policy variable defining the dollar amount of load management to be written off as expenses on a yearly basis.

XLMEXP (ENDUSE,YEAR)**: Load Management Expensed** (M$)

A user-specified policy variable defining the dollar amount of load management to be written off as expenses on a yearly basis.

XLMMS (ENDUSE,YEAR)**: Load Management Market Share**

A user-specified input that overrides the endogenous calculation of load management market share in the load management procedure in the demand sector.

XLMMS (ENDUSE,YEAR)**: Load Management Market Share**

A user-specified input that overrides the endogenous calculation of load management market share in the load management procedure in the demand sector.

XMMSF (ENDUSE,TECH,EC,YEAR)**: Market Share Fraction by Device** ($/$)

A user-specified input that overrides the endogenous calculation of load management market share fraction by device in the load management procedure in the demand sector.

XMMSF (ENDUSE,TECH,EC,YEAR)**: Market Share Fraction by Device** ($/$)

A user-specified input that overrides the endogenous calculation of load management market share fraction by device in the load management procedure in the demand sector.

XMVF (ENDUSE,TECH,EC)**: Market Share Variance Factor** ($/$)

A national value from Demand 81 used in the calibration process.

XMVF (ENDUSE,TECH,EC)**: Market Share Variance Factor** ($/$)

A national value from Demand 81 used in the calibration process.

XNA (AA,YEAR)**: Historical Net Assets** ($M)

Historical net assets are calculated in EDATA by subtracting construction work and accumulated depreciation (XACDP) from Total Gross Assets (XGA).

XNA (AA,YEAR)**: Historical Net Assets** ($M)

Historical net assets are calculated in EDATA by subtracting construction work and accumulated depreciation (XACDP) from Total Gross Assets (XGA).

XNTINC (YEAR)**: Historical Net Income** (M$/YR)

Source: FERC #1 - "Statement of Income for the Year", (1980) page 116a , line 65; (1981-1992), page 117, line 68; and (1993), page 117, line 72.

XNTINC (YEAR)**: Historical Net Income** (M$/YR)

Source: FERC #1 - "Statement of Income for the Year", (1980) page 116a , line 65; (1981-1992), page 117, line 68; and (1993), page 117, line 72.

XOMC (PLANT,YEAR)**: Historical Plant Op & Main Costs** ($M)

Source: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), page 417, line 20 for Oil -"Total Power Production Expenses - Steam Power";(1980), page 418, line 73 for Combustion Turbine -"Total Power Production Expenses - Other Power" (1981-1992) for oil, page 320 line 20 Total Power Production Expenses - Steam Power" and (1981-1992) Combustion Turbine, page 321, line 73, "Other Power Generation 547 Fuel" and (1993) Combustion Turbine, page 321, line 63, "Total Power Production Expenses - Steam Power. This data include fuel costs which must be removed (subtract XFC from XOMC).

XOMC (PLANT,YEAR)**: Historical Plant Op & Main Costs** ($M)

Source: FERC #1 - "Electric Operation and Maintenace Expenses" - (1980), page 417, line 20 for Oil -"Total Power Production Expenses - Steam Power";(1980), page 418, line 73 for Combustion Turbine -"Total Power Production Expenses - Other Power" (1981-1992) for oil, page 320 line 20 Total Power Production Expenses - Steam Power" and (1981-1992) Combustion Turbine, page 321, line 73, "Other Power Generation 547 Fuel" and (1993) Combustion Turbine, page 321, line 63, "Total Power Production Expenses - Steam Power. This data include fuel costs which must be removed (subtract XFC from XOMC).

XOPEXP (YEAR)**: Historical Operating Expenses** (M$)

Source: FERC #1 - "Statement of Income for the Year", page 119 , line 23, column (c)

XOPEXP (YEAR)**: Historical Operating Expenses** (M$)

Source: FERC #1 - "Statement of Income for the Year", page 119 , line 23, column (c)

XOPINC (YEAR)**: Historical Operating Income** (M$/YR)

Source: FERC #1 - "Statement of Income for the Year", page 114 , line 20 and 24, column (c)

XOPINC (YEAR)**: Historical Operating Income** (M$/YR)

Source: FERC #1 - "Statement of Income for the Year", page 114 , line 20 and 24, column (c)

XPCC (ENDUSE,TECH,EC,YEAR)**: Process Capital Cost** ($/($/YR))

Source: Some national and regional data is available. Currently US I/O Tables from Massachusetts Energy Office. Can be used to override the endogenous calculation of PCC, if desired.

XPCC (ENDUSE,TECH,EC,YEAR)**: Process Capital Cost** ($/($/YR))

Source: Some national and regional data is available. Currently US I/O Tables from Massachusetts Energy Office. Can be used to override the endogenous calculation of PCC, if desired.

XPEE (ENDUSE,TECH,EC,YEAR)**: Historical Process Efficiency** ($/Btu or $/J)

If values are available, XPEE can be used in the computation of historical energy demand.

XPEE (ENDUSE,TECH,EC,YEAR)**: Historical Process Efficiency** ($/Btu or $/J)

If values are available, XPEE can be used in the computation of historical energy demand.

XPEER (ENDUSE,TECH,EC,YEAR)**: Exogenous Policy Participation Response** (Btu/Btu or J/J)

This data, if available can be used to override the endogenous calculation of PEER in the demand sector. Often this variable is an output from a DSM spreadsheet program. The model can be run with and without this exogenous override for comparison purposes.

XPEER (ENDUSE,TECH,EC,YEAR)**: Exogenous Policy Participation Response** (Btu/Btu or J/J)

This data, if available can be used to override the endogenous calculation of PEER in the demand sector. Often this variable is an output from a DSM spreadsheet program. The model can be run with and without this exogenous override for comparison purposes.

XPPCC (PP,YEAR)**: Purchase Power Capacity Charge** 1975$/MW

Purchase power capacity charges are calculated historically as the total cost of energy (XPPDC) divided by the purchase capacity (PPGC).

XPPCC (PP,YEAR)**: Purchase Power Capacity Charge** (1975$/MW)

Purchase power capacity charges are calculated historically as the total cost of energy (XPPDC) divided by the purchase capacity (PPGC).

XPPDC (PP,YEAR)**: Historical Firm Purchases Demand Charge** (M$/YR)

If purchased power was used by the utility, this data is available in FERC #1.

XPPDC (PP,YEAR)**: Historical Firm Purchases Demand Charge** (M$/YR)

If purchased power was used by the utility, this data is available in FERC #1.

XPPEG (PP,YEAR)**: Historical Firm Purchases Generation** (GWH)

If purchased power was used by the utility, this data is available in FERC #1.

XPPEG (PP,YEAR)**: Historical Firm Purchases Generation** (gWh)

If purchased power was used by the utility, this data is available in FERC #1.

XPPGC (PP,YEAR)**: Historical Firm Purchases Capacity** MW

An exogenously specified input used in the calculation of purchase power capacity (PPGC).

XPPGC (PP,YEAR)**: Historical Firm Purchases Capacity** (MW)

An exogenously specified input used in the calculation of purchase power capacity (PPGC).

XPPUC (PP,YEAR)**: Purchase Power Unit Cost** (Real Mills/kWh)

Purchase power unit cost is the cost in mills of purchase power measured in kW. It is calculated in EDATA as the total cost of energy (XPPCT) divided by the total energy purchased (XPPEG).

XPPUC (PP,YEAR)**: Purchase Power Unit Cost** (Real Mills/kWh)

Purchase power unit cost is the cost in mills of purchase power measured in kW. It is calculated in EDATA as the total cost of energy (XPPCT) divided by the total energy purchased (XPPEG).

XPS (YEAR)**: Historical Preferred Stock** (M$/YR)

Source: FERC #1 - Comparative Balance Sheet - (1980) page 111, line2; (1981-1993), page 112, line 3, column 3. entitiled Preferred Stock Issued.

XPS (YEAR)**: Historical Preferred Stock** (M$/YR)

Source: FERC #1 - Comparative Balance Sheet - (1980) page 111, line2; (1981-1993), page 112, line 3, column 3. entitled Preferred Stock Issued.

XPSDV (YEAR)**: Historical Preferred Stock Dividends** (M$/YR)

Source: FERC #1 Statement of Retained Earnings (1980), page 117, line 29; (1981-1993), page 118, line 29. Total dividends declared.

XPSDV (YEAR)**: Historical Preferred Stock Dividends** (M$/YR)

Source: FERC #1 Statement of Retained Earnings (1980), page 117, line 29; (1981-1993), page 118, line 29. Total dividends declared.

XPSFD (YEAR)**: Historical New Preferred Stock** (M$/YR)

Source: FERC #1 - "Statement of Changes in Financial Position" - (1980), pages 118, line 15, (1981-1987), "Statement of cash Flows", (1988-1993) pages 120 or 121, lin 20 or 62, "Preferred Stock,"

XPSFD (YEAR)**: Historical New Preferred Stock** (M$/YR)

Source: FERC #1 - "Statement of Changes in Financial Position" - (1980), pages 118, line 15, (1981-1987), "Statement of cash Flows", (1988-1993) pages 120 or 121, line 20 or 62, "Preferred Stock,"

XPSLOAD (YEAR)**: Historical Power Storage Used** (GWH)

From the Utility Financial Review - Sales, Revenues, and Customers

XPSLOAD (YEAR)**: Historical Power Storage Used** (gWh)

From the Utility Financial Review - Sales, Revenues, and Customers

XPSOUTPUT (YEAR)**: Historical Power Storage Generated** (GWH)

Source: FERC #1 - "Pumped Storage Generating Plant Statistics", page 408.

XPSOUTPUT (YEAR)**: Historical Power Storage Generated** (gWh)

Source: FERC #1 - "Pumped Storage Generating Plant Statistics", page 408.

XPSSF (YEAR)**: Historical PS Sinking Fund** (M$/YR)

Future values (1994-1998) are from FERC #1, page 123a "Cumulative Preferred Stock". Historical values are calculated in EDATA by subtracting current preferred stock and new preferred stock issued from the value of preferred stock last year.

XPSSF (YEAR)**: Historical PS Sinking Fund** (M$/YR)

Future values (1994-1998) are from FERC #1, page 123a "Cumulative Preferred Stock". Historical values are calculated in EDATA by subtracting current preferred stock and new preferred stock issued from the value of preferred stock last year.

XPTAX (YEAR)**: Historical Property and Revenue Tax** (M$/YR)

Source: FERC #1 - "Statement of Income for the Year", (1980-1992) page 114 , line 11; and (1993), page 114, line 13. Taxes other than income taxes..

XPTAX (YEAR)**: Historical Property and Revenue Tax** (M$/YR)

Source: FERC #1 - "Statement of Income for the Year", (1980-1992) page 114 , line 11; and (1993), page 114, line 13. Taxes other than income taxes..

XPUCT (YEAR)**: Historical Cost of Purchased & Resale Power** (M$/YR)

This is the historical total cost of all power purchased by the utility including qualified facilities, firm and economy purchases and net interchange costs. It is calculated in EDATA.

XPUCT (YEAR)**: Historical Cost of Purchased & Resale Power** (M$/YR)

This is the historical total cost of all power purchased by the utility including qualified facilities, firm and economy purchases and net interchange costs. It is calculated in EDATA.

XQFCT (TECH,YEAR)**: Historical Qualified Facilities Cost** (M$/YR)

Exogenously specified variable used to calculate historical total QF costs.

XQFEG (TECH,YEAR)**: Historical QF Generation** (GWH/YR)

Exogenously specified variable used to calculate historical electricity generated.

XQFEG (TECH,YEAR)**: Historical QF Generation** (gWh/YR)

Exogenously specified variable used to calculate historical electricity generated.

XQFGC (TECH,YEAR)**: Historical SPP Capacity** (MW)

An exogenously specified variable used in the calculation of miscellaneous capacity types (FMGC) and QFEG.

XQFGC (TECH,YEAR)**: Historical SPP Capacity** (MW)

An exogenously specified variable used in the calculation of miscellaneous capacity types (FMGC) and QFEG>

XQFIGC (TECH,YEAR)**: Historical Indicated QF Capacity** (MW)

XRDMSF (ENDUSE,TECH,CTECH,EC)**: Device Retrofit Market Share by Device** (1/YR)

These values, if available can be used to override the RDMSF calculated in the device retrofit procedure in the demand sector. Values can come from the results of other retrofit programs or DSM spreadsheet results.

XRDMSF (ENDUSE,TECH,CTECH,EC)**: Device Retrofit Market Share by Device** (1/YR)

These values, if available can be used to override the RDMSF calculated in the device retrofit procedure in the demand sector. Values can come from the results of other retrofit programs or DSM spreadsheet results.

XRE (YEAR)**: Historical Retained Earnings** (M$)

Source: FERC #1 Statement of Retained Earnings (1980), page 117, line 38; (1981-1993), page 118, line 38.

XRE (YEAR)**: Historical Retained Earnings** (M$)

Source: FERC #1 Statement of Retained Earnings (1980), page 117, line 38; (1981-1993), page 118, line 38.

XREV (YEAR)**: Historical Revenue** (M$/YR)

Source: FERC #1 - "Statement of Income for the Year" - page 114, column (c), line 2, "Operating Revenues.

XREV (YEAR)**: Historical Revenue** (M$/YR)

Source: FERC #1 - "Statement of Income for the Year" - page 114, column (c), line 2, "Operating Revenues.

XRGA (AA,YEAR)**: GA Retirements** (M$)

Exogenously specified gross retirements used in the calculation of retirements of gross assets from construction.

XRGA (AA,YEAR)**: GA Retirements** (M$)

Exogenously specified gross retirements used in the calculation of retirements of gross assets from construction.

XRMSF (ENDUSE,TECH,EC,YEAR)**: Retrofit Market Share Fraction by Device** (1/YR)

These values, if available can be used to override the RMSF calculated in the device retrofit procedure in the demand sector. Values can come from the results of other retrofit programs or DSM spreadsheet results.

XRMSF (ENDUSE,TECH,EC,YEAR)**: Retrofit Market Share Fraction by Device** (1/YR)

These values, if available can be used to override the RMSF calculated in the device retrofit procedure in the demand sector. Values can come from the results of other retrofit programs or DSM spreadsheet results.

XRPMSF (ENDUSE,TECH,EC,YEAR)**: Process Retrofit Market Share by Device** (1/YR)

These values, if available can be used to override the RPMSF calculated in the process retrofit procedure in the demand sector. Values can come from the results of other retrofit programs or DSM spreadsheet results.

XRPMSF (ENDUSE,TECH,EC,YEAR)**: Process Retrofit Market Share by Device** (1/YR)

These values, if available can be used to override the RPMSF calculated in the process retrofit procedure in the demand sector. Values can come from the results of other retrofit programs or DSM spreadsheet results.

XRTPE (RTCLASS,YEAR)**: Electricity Prices** (mills/kWh)

Electricity prices by rate class are calculated historically as the sum over prices of XFP (mapped to the appropriate rate class).

XRTPE (RTCLASS,YEAR)**: Electricity Prices** (mills/kWh)

Electricity prices by rate class are calculated historically as the sum over prices of XFP (mapped to the appropriate rate class).

XRTRV (RTCLASS,YEAR)**: Historical Rate Class Revenue** ($M/YR)

Rate class revenue is calculated historically as the product of rate class prices times rate class sales.

XRTRV (RTCLASS,YEAR)**: Historical Rate Class Revenue** ($M/YR)

Rate class revenue is calculated historically as the product of rate class prices times rate class sales.

XSC (YEAR)**: Sales Expenses** (M$)

Source: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 419, column (b); (1981-1992), page 322, column (b); line 147 "Total Sales Expenses" and (1993), page 322, column (b), line 188 "Total Sales Expenses."

XSC (YEAR)**: Sales Expenses** (M$)

Source: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 419, column (b); (1981-1992), page 322, column (b); line 147 "Total Sales Expenses" and (1993), page 322, column (b), line 188 "Total Sales Expenses."

XSCPOINTER (POWER)**: Initial Pointer to Current Resource Option**

A pointer variable used to keep track of peak and baseload resources in the resource list. The pointer for peak is set at the first peaking unit; similarly the pointer for baseload is set at the first baseload unit.

XSCPOINTER (POWER)**: Initial Pointer to Current Resource Option**

A pointer variable used to keep track of peak and baseload resources in the resource list. The pointer for peak is set at the first peaking unit; similarly the pointer for baseload is set at the first baseload unit.

XSDIN (YEAR)**: Historical Short Term Interest** (M$)

The historical short term interest is calculated by subtracting long and intermediate term debt interest (XDBIN and XIDIN) from the total interest paid (XINPAY).

XSDIN (YEAR)**: Historical Short Term Interest** (M$)

The historical short term interest is calculated by subtracting long and intermediate term debt interest (XDBIN and XIDIN) from the total interest paid (XINPAY).

XSLDP (AA,YEAR)**: Historical Annual Depreciation** (M$)

Source: FERC #1 - "Depreciation and Amortization of Electric Plant," 1980, page 429, lines numbers 2,6-9; 1981-1985, page 334, line numbers 2,6-9; and 1986-1993, page 336, line numbers 2,6-9.

XSLDP (AA,YEAR)**: Historical Annual Depreciation** (M$)

Source: FERC #1 - "Depreciation and Amortization of Electric Plant," 1980, page 429, lines numbers 2,6-9; 1981-1985, page 334, line numbers 2,6-9; and 1986-1993, page 336, line numbers 2,6-9.

XSLDPR (YEAR)**: Historical Annual Depreciation** ($M)

Calculated in EDATA, it is XSLDP summed over assets.

XSLDPR (YEAR)**: Historical Annual Depreciation** ($M)

Calculated in EDATA, it is XSLDP summed over assets.

XSMSF (TECH,EC,YEAR)**: Market Share Fraction by System** ($/$)

These values, if available can be used to override the SMSF calculated in the fuel system procedure in the demand sector. Values can come from the results of other retrofit programs or DSM spreadsheet results.

XSMSF (TECH,EC,YEAR)**: Market Share Fraction by System** ($/$)

These values, if available can be used to override the SMSF calculated in the fuel system procedure in the demand sector. Values can come from the results of other retrofit programs or DSM spreadsheet results.

XTAF (YEAR)**: Historical Total Allowance for Funds** (M$)

The total allowance for funds is the sum of XAFEQ and XAFDB - debt and equity funds.

XTAF (YEAR)**: Historical Total Allowance for Funds** (M$)

The total allowance for funds is the sum of XAFEQ and XAFDB - debt and equity funds.

XTDCC (TD,YEAR)**: T&D Capital Costs** ($/KW)

This variable is estimated from utility documents such as IRP filings.

XTDCC (TD,YEAR)**: T&D Capital Costs** ($/KW)

This variable is estimated from utility documents such as IRP filings.

XTDOMC (TD,YEAR)**: Historical Total T&D Op & Main Costs** ($M)

Source for Transmission: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 418, column (b); (1981-1992), page 321, column (b); line 147 "Total Transmission Expenses" and (1993), page 321, column (b), line 100 "Total Transmission Expenses." Source for Distribution : FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 419, column (b); (1981-1992), page 322, column (b); line 125 "Total Distribution Expenses" and (1993), page 322, column (b), line 126 "Total Distribution Expenses."

XTDOMC (TD,YEAR)**: Historical Total T&D Op & Main Costs** ($M)

Source for Transmission: FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 418, column (b); (1981-1992), page 321, column (b); line 147 "Total Transmission Expenses" and (1993), page 321, column (b), line 100 "Total Transmission Expenses." Source for Distribution : FERC #1 - "Electric Operation and Maintenance Expenses" - (1980), p. 419, column (b); (1981-1992), page 322, column (b); line 125 "Total Distribution Expenses" and (1993), page 322, column (b), line 126 "Total Distribution Expenses."

XTEA (YEAR)**: Historical Total Electricity Available** (GWH)

The historical total electricity available is calculated in EDATA from the sum of total electricity generated (XTEG), purchase power and QF generation (XPPEG and XQFEG) less pumped storage (XPSOUTPUT) and net interchanges (IREC-IDEL).

XTEA (YEAR)**: Historical Total Electricity Available** (gWh)

The historical total electricity available is calculated in EDATA from the sum of total electricity generated (XTEG), purchase power and QF generation (XPPEG and XQFEG) less pumped storage (XPSOUTPUT) and net interchanges (IREC-IDEL).

XTEG (YEAR)**: Historical Total Electricity Generated** (gWh)

Historical total electricity generated is calculated in EDATA as the sum over plant of electricity generated (XEG).

XTEG (YEAR)**: Historical Total Electricity Generated** (GWH)

Historical total electricity generated is calculated in EDATA as the sum over plant of electricity generated (XEG).

XTFC (YEAR)**:** **Historical Total Fuel Cost** (M$)

Historical total fuel costs are calculated in EDATA as the sum over plant of fuel costs by plant (XFC).

XTFC (YEAR)**:** **Historical Total Fuel Cost** (M$)

Historical total fuel costs are calculated in EDATA as the sum over plant of fuel costs by plant (XFC).

XTGA (YEAR)**:** **Historical Total Gross Assets** ($M)

Source FERC #1, Comparative Balance Sheet, page 110, line 2, column d.

XTGA (YEAR)**:** **Historical Total Gross Assets** ($M)

Source FERC #1, Comparative Balance Sheet, page 110, line 2, column d.

XTGAOM (YEAR)**:** **Historical Total Gen & Admin Op & Main Costs** ($M)

These historical costs are calculated in EDATA as the sum of customer accounts costs, customer service and information costs, sales costs and administrative and general costs.

XTGAOM (YEAR)**:** **Historical Total Gen & Admin Op & Main Costs** ($M)

These historical costs are calculated in EDATA as the sum of customer accounts costs, customer service and information costs, sales costs and administrative and general costs.

XTOMC (YEAR)**:** **Historical Total Op & Main Costs** ($M)

Historical total operating and maintenance costs for both transmission and distribution are calculated as the sum over plan of XOMC plus the sum over transmission and distribution of XTDOMC plus XTGAOM.

XTOMC (YEAR)**:** **Historical Total Op & Main Costs** ($M)

Historical total operating and maintance costs for both transmission and distribution are calcuated as the sum over plan of XOMC plus the sum over transmission and distribution of XTDOMC plus XTGAOM.

XTPOMC (YEAR)**:** **Historical Total Power Op & Main Costs** ($M)

Total operating and maintenance costs are calculated historically in EDATA as the sum over plant of the operating and maintenance costs by plant.

XTPOMC (YEAR)**: Historical Total Power Op & Main Costs** ($M)

Total operating and maintenance costs are calculated historically in EDATA as the sum over plant of the operating and maintenace costs by plant.

XTSALE (YEAR)**: Historical Total Ann. Electricity Use** (gWh/YR)

Historical total annual electricity usage is the sum of XSALES over class.

XTSALE (YEAR)**: Historical Total Ann. Electricity Use** (GWH/YR)

Historical total annual electricity usage is the sum of XSALES over class.

XUFC (PLANT,YEAR)**: Historical Unit Fuel Cost** (MILLS/kWh)

Historical Unit Fuel Costs are the costs of the generating stations owned by the electric utility. They are calculated in EDATA as the ration of XFC to XEG - spreading fuel costs on average over all generation.

XUFC (PLANT,YEAR)**: Historical Unit Fuel Cost** (MILLS/kWh)

Historical Unit Fuel Costs are the costs of the generating stations owned by the electric utility. They are calculated in EDATA as the ration of XFC to XEG - spreading fuel costs on average over all generation.

XXRGA (AA,YEAR)**: Retiring GA from Direct Constr. Cost** (M$/YR)

Source: FERC #1 - "Electric Plant in Service," (1980), page 401-403; (1981-1984), page 202-204; and 1985-1993), page 204-207, all column (d) "Retired Property Charged".

XXRGA (AA,YEAR)**: Retiring GA from Direct Constr. Cost** (M$/YR)

Source: FERC #1 - "Electric Plant in Service," (1980), page 401-403; (1981-1984), page 202-204; and 1985-1993), page 204-207, all column (d) "Retired Property Charged".

XXRV (CLASS,YEAR)**: Historical Rate Class Revenue** ($M/YR)

Source: FERC #1, pages 301 and 409. Residential revenues are Acct 440, line 2; commercial, Acct 442, line 4, industrial, Acct 443, line 5 and streetlighting and miscellaneous, Accts 444 plus 445, lines 6 and7. The detailed accounts on pages 310 and 412 are also used.

XXRV (CLASS,YEAR)**: Historical Rate Class Revenue** ($M/YR)

Source: FERC #1, pages 301 and 409. Residential revenues are Acct 440, line 2; commercial, Acct 442, line 4, industrial, Acct 443, line 5 and street lighting and miscellaneous, Accts 444 plus 445, lines 6 and7. The detailed accounts on pages 310 and 412 are also used.

YCERSM (ENDUSE,EC,YEAR)**: CERSM Calibration Control**

The method for the CERSM calibration(YCERSM) is to use the value of the last calibrated year(YCERSM=3) for all future values. The value in the ZERO year slot is the regression method. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YCERSM (ENDUSE,EC,YEAR)**: CERSM Calibration Control**

The method for the CERSM calibration(YCERSM) is to use the value of the last calibrated year(YCERSM=3) for all future values. The value in the ZERO year slot is the regression method. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YCGCUF (TECH,EC,YEAR)**: Cogeneration Capacity Utilization Factor** (($/YR)/($/YR))

The method for the cogeneration capacity utilization factor(YCGCUF) is to use the value of the last calibrated year(YCGCUF=3) for all future values. The value in the ZERO year slot is the regression method. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YCGCUF (TECH,EC,YEAR)**: Cogeneration Capacity Utilization Factor** (($/YR)/($/YR))

The method for the cogeneration capacity utilization factor(YCGCUF) is to use the value of the last calibrated year(YCGCUF=3) for all future values. The value in the ZERO year slot is the regression method. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YCGMSM (TECH,EC,YEAR)**: Cogeneration Market Share Multiplier** ($/$)

The method for the commercial cogeneration market share calibration(YCGMSM) is to compute an historical average(YCGMSM=4) after removing the outliers using the HAT method(YCGMSM=2). The average is used for all future values. Therefore the value in the ZERO year equals 4, in the historical years equals 2, and in the future years the value does not matter. The method for the industrial cogeneration market share calibration(YCGMSM) is to use the last historical value(YCGMSM=3) for all future values. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YCGMSM (TECH,EC,YEAR)**: Cogeneration Market Share Multiplier** ($/$)

The method for the commercial cogeneration market share calibration(YCGMSM) is to compute an historical average(YCGMSM=4) after removing the outliers using the HAT

method(YCGMSM=2). The average is used for all future values. Therefore the value in the ZERO year equals 4, in the historical years equals 2, and in the future years the value does not matter. The method for the industrial cogeneration market share calibration(YCGMSM) is to use the last historical value(YCGMSM=3) for all future values. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YCMSM (ENDUSE,TECH,CTECH,EC,YEAR)**: CMSM Calibration Control**

Values found in the *data files.

YCMSM (ENDUSE,TECH,CTECH,EC,YEAR)**: CMSM Calibration Control**

Values found in the *data files.

YCUF (ENDUSE,TECH,EC,YEAR)**: CUF Calibration Control**

The method for the commercial capacity utilization factor calibration(YCUF) is to linearly interpolate to a final value(YCUF=-1) over five years. Coal and oil use the value of the last calibrated year(YCUF=3) for future years. Therefore the value of the ZERO year equals -1; the value of the historical years does not matter; the value of the first 5 future years is -99; the value of the long term future is 1.0. For coal and oil the ZERO year equals 3; other years do not matter. The method for the industrial capacity utilization factor calibration(YCUF) is to linearly interpolate to a final value(YCUF=-1) over five years. The value of the historical years does not matter. Values found in the *data files.

YCUF (ENDUSE,TECH,EC,YEAR)**: CUF Calibration Control**

The method for the commercial capacity utilization factor calibration(YCUF) is to linearly interpolate to a final value(YCUF=-1) over five years. Coal and oil use the value of the last calibrated year(YCUF=3) for future years. Therefore the value of the ZERO year equals -1; the value of the historical years does not matter; the value of the first 5 future years is -99; the value of the long term future is 1.0. For coal and oil the ZERO year equals 3; other years do not matter. The method for the industrial capacity utilization factor calibration(YCUF) is to linearly interpolate to a final value(YCUF=-1) over five years. The value of the historical years does not matter. Values found in the *data files.

YDEMM (ENDUSE,TECH,YEAR)**: DEMM Calibration Control**

The method for the device maximum efficiency multiplier(YDEMM) is to use the value of the last calibrated year(YDEMM=3) for all future values. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YDEMM (ENDUSE,TECH,YEAR)**: DEMM Calibration Control**

The method for the device maximum efficiency multiplier(YDEMM) is to use the value of the last calibrated year(YDEMM=3) for all future values. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YDST (ENDUSE,EC,YEAR)**: Device Saturation Calibration Control** (Btu/Btu)

The method for the saturation calibration(YDST) is to use the full asymptotic method(YDST=8) to interpolate the future years(YDST=-99). Therefore the value in the ZERO year equals 8; the values in the historical years do not matter; the value of the future years is -99. Values found in the *data files.

YDST (ENDUSE,EC,YEAR)**: Device Saturation Calibration Control** (Btu/Btu)

The method for the saturation calibration(YDST) is to use the full asymptotic method(YDST=8) to interpolate the future years(YDST=-99). Therefore the value in the ZERO year equals 8; the values in the historical years do not matter; the value of the future years is -99. Values found in the *data files.

YENDTIME : Last Year of Calibration Period (DATE)

Last Year of Calibration(DATE). This variable must be given a value before it is used later. Values found in the demand sector.

YENDTIME : Last Year of Calibration Period (DATE)

Last Year of Calibration(DATE). This variable must be given a value before it is used later. Values found in the demand sector.

YFMSM (ENDUSE,TECH,CTECH,YEAR)**: Market Share Multiplier Constraint** ($/$)

The method for the fungible calibration(YFMSM) is to compute an historical average(YFMSM=4) after removing the outliers using the the HAT method(YFMSM=2). This historical average is used for all future values. Therefore the value of the ZERO year equals 4; the value of the historical years equals 2; the value of the future years does not matter. Values found in the *data files.

YFMSM (ENDUSE,TECH,CTECH,YEAR)**: Market Share Multiplier Constraint** ($/$)

The method for the fungible calibration(YFMSM) is to compute an historical average(YFMSM=4) after removing the outliers using the HAT method(YFMSM=2). This historical average is used for all future values. Therefore the value of the ZERO year equals 4; the value of the historical years equals 2; the value of the future years does not matter. Values found in the *data files.

YFSPEE (TECH,EC,YEAR)**: Feedstock Process Efficiency Calibration Control**

The method for the feedstock process efficiency calibration(YFSPEE) is to use the value of the last calibrated year(YFSPEE=3) for all future values. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YFSPEE (TECH,EC,YEAR)**: Feedstock Process Efficiency Calibration Control**

The method for the feedstock process efficiency calibration(YFSPEE) is to use the value of the last calibrated year(YFSPEE=3) for all future values. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YFUTURE : First Year after Calibration Period

The year after YLAST must be specified. Values found in the demand sector..

YFUTURE : First Year after Calibration Period

The year after YLAST must be specified. Values found in the demand sector..

YLAST : Last Year of Calibration Period

Values found in the demand sector.

YLAST : Last Year of Calibration Period

Values found in the demand sector.

YMMSM (ENDUSE,TECH,EC,YEAR)**: MMSM Calibration Control**

The method for the market share calibration(YMMSM) is to compute an historical average(YMMSM=4) after removing the outliers using the the HAT method(YMMSM=2). This historical average is used for all future values. Therefore the value of the ZERO year equals 4; the value of the historical years equals 2; the value of the future years does not matter. Values found in the *data files.

YMMSM (ENDUSE,TECH,EC,YEAR)**: MMSM Calibration Control**

The method for the market share calibration(YMMSM) is to compute an historical average(YMMSM=4) after removing the outliers using the HAT method (YMMSM=2). This historical average is used for all future values. Therefore the value of the ZERO year equals 4; the value of the historical years equals 2; the value of the future years does not matter. Values found in the *data files.

YPEMM (ENDUSE,TECH,EC,YEAR)**: PEMM Calibration Control**

The method for the process maximum efficiency multiplier(YPEMM) is to use the value of the last calibrated year(YPEMM=3) for all future values. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YPEMM (ENDUSE,TECH,EC,YEAR)**: PEMM Calibration Control**

The method for the process maximum efficiency multiplier(YPEMM) is to use the value of the last calibrated year(YPEMM=3) for all future values. Therefore the value in the ZERO year equals 3 and the values of all other years do not matter. Values found in the *data files.

YRDMSM (ENDUSE,TECH,CTECH,EC,YEAR)**: RDMSM Calibration Control**

Values found in the *data files.

YRDMSM (ENDUSE,TECH,CTECH,EC,YEAR)**: RDMSM Calibration Control**

Values found in the *data files.

YRMSM (ENDUSE,TECH,EC,YEAR)**: RMSM Calibration Control**

Values found in the *data files.

YRMSM (ENDUSE,TECH,EC,YEAR)**: RMSM Calibration Control**

Values found in the *data files.

YRPMSM (ENDUSE,TECH,EC,YEAR)**: RPMSM Calibration Control**

Values found in the *data files.

YRPMSM (ENDUSE,TECH,EC,YEAR)**: RPMSM Calibration Control**

Values found in the *data files.

YUCERSM : Upper Error Limit for CERSM (Percent)

Values found in the *data files.

YUCERSM : Upper Error Limit for CERSM (Percent)

Values found in the *data files.

YUCUF : Upper Error Limit for CUF (Percent)

Values found in the *data files.

YUCUF : Upper Error Limit for CUF (Percent)

Values found in the *data files.

YUDMD : Upper Error Limit for DMD (Btu/Btu)

Values found in the *data files.

YUDMD : Upper Error Limit for DMD (Btu/Btu)

Values found in the *data files.