

Cash Flow Projections and Life Cycle Cost Model For Financing Energy Efficiency & Conservation Measures ("LCCA Model")

Users' Manual

(Version 1.0, release date 01/22/2007)

OVERVIEW

This LCCA model is the first version of a model to evaluate the economic performance of energy efficiency and energy conservation measures (ECMs) and projects in accordance with the California Department of Finance (DOF) guidelines. This model will be periodically updated. The ultimate goal is to have this model become a web-based tool offering user-friendly input 'screens' and links to other web pages for data such as utility tariffs. This User's Manual explains how the present model works and how it is to be used.

The LCCA model nor the utilization of the model does not substitute for a detailed energy feasibility study or similar analysis. The model simply takes the results of energy audits or energy feasibility studies and tests the cash flow and economic metrics against approved standards. The User should not use this model to judge the quality of ECMs or the energy efficiency project. The model is primarily used as a mechanism for securing financing through the Department of General Services (DGS) GS\$Mart financing program, or confirming any other sources of financing for energy efficiency retrofit projects (see Budget Letter 06-27 for more information regarding financing of energy efficiency retrofit projects).

This document (and the accompanying User's Instructions) will provide step-by-step instructions for using the LCCA Model. While the model is Excel-based, one does not need extensive experience with Excel to use the LCCA model. The User will be guided as to where to input project information and the model will automatically generate results based on these inputs.

Definitions of "ECMs" and "Projects"

The User will be able to generate cash flow and life cycle cost projections for individual "ECMs" and "Projects", which consist of multiple ECMs. The model gives the User considerable flexibility in defining your ECMs.

Individual ECMs – An ECM is an identifiable energy conservation or efficiency measure that could potentially be implemented on a stand-alone basis. For example, if you are retrofitting the lighting systems in a number of buildings, you could define each building retrofit as a separate ECM. Alternatively, you could define "all lighting ECMs" as one single, combined ECM. Generally, if (i) cost and savings data are available to evaluate the individual components within a group of ECMs and (ii) the ECMs can be

evaluated separately and, if necessary, implemented independently, then you may want to define each major component as a separate ECM and enter each separately in the model. For the purposes of financing, however, the User should understand that it is Projects that are financed, not separate ECMs (unless the Project consist of only one ECM).

Projects – "Projects" are defined as a group of multiple ECMs. Returning to the example in the preceding paragraph, you could define each building retrofit as a separate ECM and, if so, you could then combine any subgroup of them as a "Project" to test in the model. Normally, however, a Project will consist of different types of ECMs that you may be considering as part of a total financing package. The Project may include a series of lighting retrofits, new motors, building insulation, etc. The point is that the User has the ability to define ECMs and then establish any subset thereof as a Project to test against the established standards. The User also has total flexibility in changing the composition of ECMs that is to be included in a given Project for a given run of the model.

Once the User has entered the required data for your ECMs, the User can run the model to derive the cash flows and economic metrics for any single ECM or for a Project that could include any combination of ECMs that the User has entered into the model. Conversely, you can exclude any ECMs from the Project you are testing. The User can easily change the selection of ECMs to include in a Project, which enables the User to test any combination of ECMs that has been entered into the model. This is accomplished by setting the desired value in the "List ECMs to Accumulate" parameter located at the top of the "User Inputs" worksheet of the model.

Note: An Excel workbook can be comprised of several worksheets. This LCCA model is an Excel workbook comprised of eight interrelated and interlinked worksheets.

In summary:

- User can evaluate individual ECMs or a Project consisting of multiple ECMs:
 - You can test any one ECM entered in this model
 - You can combine any of the ECMs entered in this model as a subset and test that subset as a Project of ECMs.
- User can analyze the ECMs over any time period. If any of the ECMs has a useful life less than the period of analysis, the model assumes that those ECMs will produce zero savings for the years beyond their respective useful lives.

Model Limitations

There are some limitations on the type and number of ECMs that can be entered into the model. Specifically:

- The model only evaluates energy efficiency and energy conservation ECMs.
 - Energy generation ECMs are beyond its scope except for solar photovoltaic (PV) ECMs (onsite power generation).

- Each solar PV ECM must be entered separately from other efficiency ECMs.
- Once a PV ECM has been entered as a separate ECM, any PV ECM so entered may be included in a Project of ECMs for cash flow analysis.
- A maximum of 25 ECMs may be entered.
- ECMs that save gas must be entered separately from ECMs that save electricity.

Note: Although the model can analyze a solar PV as an energy generation ECM, it should be understood that a solar PV energy generation system does not necessarily save energy, it merely displaces the utility source of energy generation with onsite generation. Also, the User should understand that solar PV energy generation systems will typically not be allowed to be financed through GSSMart, and as such, must be evaluated on a case by case basis – refer to the DGS Management Memo 06-14, which accompanies the DOF Budget Letter 06-27, regarding this issue.

Notes on Tariffs

Most electricity tariffs have seasonal rates, and tariffs for large users typically have time of use (TOU) rates. The seasonal and TOU differentials are important in the evaluation of many energy ECMs. Energy audits and energy feasibility studies must be sufficiently detailed to provide seasonal and TOU information where appropriate.

This model accommodates sites with multiple meters and tariffs. The User may enter ECMs that reduce energy on different tariffs by separately identifying and entering those ECMs and their tariffs in separate columns in the model:

- ECMs that reduce energy on different utility tariffs must be entered as separate ECMs in the worksheet, but the User may then include ECMs on different tariffs in a “Project” of ECMs for analysis.
- ECMs on TOU-based tariffs must be entered as separate ECMs, as must ECMs on non-TOU based tariffs, but the User may choose to include non-TOU ECMs in a “Project” with TOU ECMs for cash flow analysis.

Utility tariffs and rates are complex and change regularly. As explained further below, this model captures the seasonal and TOU differentials in prices for demand and energy. However, the model does not further divide a price into its detailed components of generation, distribution, transmission, tail CTC, various DWR components, etc. A single number is used for each seasonal and TOU price for demand, and a separate single price is used for each seasonal and TOU price for energy.

The Department of General Services (DGS) will review all rates used in the model to confirm their appropriateness and accuracy.

LINE-BY-LINE INSTRUCTIONS

This section provides line-by-line instructions for using the LCCA Model. The Excel document (workbook) is comprised of the following eight worksheets, which will be explained in detail below:

1. Title
2. DGS Inputs
3. Electricity Tariffs
4. User Inputs
5. Project Analysis
6. ECM Analysis
7. Summary of Individual ECMs in Project
8. List of Inputs

It is recommended that the User have a firm knowledge of utility tariffs and billing (including where to obtain the most recent utility tariff information) and energy efficiency measures and how they save energy. Utility tariffs can change frequently, therefore, the User is advised to ensure that the most recent enforceable utility tariffs are utilized when performing an LCCA run.

The recommended approach is to be conservative in the analysis. User should first run the LCCA using zero as values for inflation and utility pricing escalators. While this may seem unreasonable, the perspective is that, at a minimum, Project savings need to be sufficient to cover the Project costs over the expected useful life of the ECMs being implemented at the current utility tariff price.

The minimum required Project debt coverage ratio is 1.10 (debt coverage ratio is defined as annual energy cost savings divided by the annual financing costs). However, the User should adjust this value upwards based on the User's perceived level of Project risk. The debt coverage ratio is used as the key "go no-go" metric to approving Projects for GS\$Mart financing. It is the economic metric that most closely aligns with budgetary requirements as per Budget Letter 06-27 (savings from the utility line item budget is used to finance project costs over the term of financing).

The User can then run the LCCA using the approved key variable economic metrics to determine the debt coverage ratio under a more likely scenario, based on current information regarding inflation and widely understood and accepted utility tariff price escalators. The source of this information will be from California state agencies that issue authoritative information for these types of economic metrics (e.g. Department of Finance for California inflation rates, the California Energy Commission for utility tariff price escalators, etc.).

1. "Title" Worksheet

You may input the name of your Facility and ECM or Project on the Title page, along with author and date last modified.

2. "DGS Inputs" Worksheet

The "DGS Inputs" worksheet lists the inputs that are controlled by DGS. While the User will be allowed to alter these assumptions for the purposes of conducting analysis of different scenarios, the User cannot alter these assumptions when pursuing financing of energy efficiency projects through the GS\$Mart program. Consult the Green California website (www.green.ca.gov) for information regarding which values are to be utilized when conducting the LCCA analysis for financing through GS\$Mart. Any questions regarding these assumptions should be directed to DGS (see contact information).

Currently the inputs in this sheet are:

- Inflation (default is estimate of CPI)
- Discount rate (tied to the State's cost of capital)
- Reinvestment rate (rarely applicable – typically used to calculate modified internal rate of return)
- Rounding (to number of significant digits)
- Real escalation (if applicable) which would be added (subtracted) to (from) CPI:
 - Routine O&M
 - Major Repair/Replacements
 - Utility electric rate
 - Utility demand rate
 - Natural gas price
- Photovoltaic degradation factor (per year)

See document titled "DGS Inputs" for information regarding these inputs.

3. "Electricity Tariffs" Worksheet

On the "Electricity Tariffs" worksheet, you will provide information and prices for each electricity tariff that applies to your ECM or Project of ECMs. This worksheet will serve as a master list of all your tariffs that will be drawn upon in other parts of the model. You must enter each tariff applicable to any of the ECM's entered in the model. If your ECM or Project (group of ECM's) has only one electrical tariff, then only one column will be used.

Instructions:

- **Rows 8-17: Non-TOU Tariffs**
 - **Row 8:** The Tariff Number is simply an identifier used in the model to correlate the tariff information on this worksheet to calculations within the

model. These are not the utilities' tariff numbers. These numbers are sequential and should NOT be altered.

- **Row 9:** Enter the utility name. Shorthand names or abbreviations may be used as this is informational only.
- **Row 10:** Enter the name and/or number used by the utility to identify its tariff.
- **Row 11:** Enter the number of summer months for that tariff.
- **Rows 13-17:** Enter the current tariff prices. As discussed above, the entries are divided into the detailed rate components shown by some utilities in their tariffs.
 - The entries here are just the amounts charged for the billing components of usage and demand. It may be necessary in some utility districts for you to separately sum detailed billing prices to arrive at the appropriate number to enter in this area of the model.
 - The model will escalate the current prices in accordance with the parameters on the "DGS Inputs" sheet.
- **Rows 24-42: TOU Tariffs**
 - **Row 24:** The Tariff Number is simply an identifier used in the model to correlate the tariff information on this worksheet to calculations within the model. These numbers are sequential and cannot be altered.
 - **Row 25:** Enter the utility name as the Service Territory. Shorthand names can be entered, as this is informational only.
 - **Row 26:** Enter the name and/or number that the utility uses to identify this tariff.
 - **Row 27:** Enter the number of summer months for that tariff.
 - **Rows 29-42:** Enter the current tariff prices. As discussed above, the entries are divided into the detailed rate components shown by some utilities in their tariffs.
 - The entries here are just the amounts charged for the billing components of usage and demand. It may be necessary in some utility districts for you to separately sum detailed billing prices to arrive at the appropriate number to enter in this area of the model.
 - The model will escalate the current prices in accordance with the parameters on the "DGS Inputs" sheet.

In the next section, you will indicate which energy ECM is associated with each tariff.

Note: User is advised to ensure that the most recent and applicable tariff information is input into the model. Care should be taken in this regards, as utility tariffs can change several times over the course of a given year. Check your utility website for the latest tariff information.

4. “User Inputs” Worksheet

On this worksheet, you will indicate each ECM under consideration. Each column from K through AI represents an “ECM.” Each ECM’s inputs should be entered in a separate column. You must complete all of the relevant fields in an ECM’s column. (Some cells may not be relevant to a particular ECM, as explained further below.)

This worksheet contains cells for your inputs and cells that you cannot change. **All cells for your inputs are shaded light green.** Please note that some input cells may not be relevant for certain ECMs and should be left blank.

The User Inputs worksheet is divided into six major areas:

1. Selection of Individual ECM or Project of ECMs to Test
2. General Assumptions
3. ECMs that Save Gas
4. ECMs that Save Electricity
 - A. On meters and tariffs that are not TOU-based
 - B. On meters and tariffs that are TOU-based
5. ECM Capital Costs
6. Operating and Maintenance Costs

Instructions:

4.1 Selection of ECMs (Rows 2-6)

This is where you will indicate which ECMs you want to test in a given run of the model or which ECMs you want to combine and treat as a single “Project” to test in a given run of the model. However, entries in Section 4.1 are made after you have entered all of the ECM data in Sections 4.2 through 4.6, and as such, instructions for Section 4.1 will be provided at the end of Section 4.

4.2 General Assumptions (Rows 7-18)

In this section, you will enter general information for each ECM:

- **Row 8:** Enter the ECM name.
 - Each ECM must have a distinct name.
 - If several efficiency ECMs were combined as a single ECM in the energy audit and cannot conveniently be disaggregated, then those may be entered as a single ECM in one of the columns provided that the energy savings all occur under the same utility tariff.
 - ECMs on different tariffs must be entered as separate ECMs.
 - PV ECMs must be entered in a separate column and not combined with any other non-PV ECMs. You can include any PV ECM in a column as

an ECM included in a Project as indicated in the discussion under “Running the Model” below.

- **Row 11:** In Cell J11, you will enter the number of years of analysis that you want to see for the cash flow analysis of the ECM or Project of ECMs that you want to analyze. This will not be done until all the data on ECMs has been entered as described below. Thus, you will need to return to these instructions for Row 11 after you have completed the balance of the worksheet.
 - If the number of years of analysis selected exceeds the useful life for any of ECMs, the cash flow will simply assume that the savings for this particular ECM are zero for years beyond its useful life.
 - In general, the number of years of analysis should be selected in relation to the term of the debt. You will likely want to select an analysis term that exceeds the debt term as ECM savings will be significantly higher once the debt has been repaid (assuming that this is less than the useful life of the ECM).

- **Row 12:** Enter the first full year in which energy savings will occur.
 - This assumption must be entered separately for each ECM (i.e., an entry is required for each ECM column).
 - Enter the calendar year in which the first full year of ECM operations will end.¹
 - The first full year of operations cannot be earlier than the year after the ECM has been installed.

- **Row 18:** This row indicates if the ECM in any column is a PV ECM. Enter “Y” for “Yes” or “N” for “No.” The model will automatically apply a degradation factor to PV output. The degradation factor is listed in the “DGS Input” sheet.

4.3 ECMs that Save Gas (Rows 21-40)

ECMs that save gas must be entered in separate columns from ECMs that save electricity. The first few rows concern tariff information and prices. For each gas savings ECM entered in an ECM column, you should enter the following tariff information:

- **Row 24:** Enter the gas utility.
- **Row 25:** Enter the gas tariff (not tariff pricing information).
- **Row 27:** Enter the annual average gas price (prior 12 months) that the ECM presently pays. (The model will escalate prices at the default rates on the “DGS Inputs” sheet).

¹ The information as to the first year of operations may not be precise and you may need to make judgments, as is the case with various assumptions in the model.

Most users participate in the state gas program. Thus, it may be appropriate to check with DGS as to the relevant gas pricing assumptions.

It is possible that a gas savings ECM could significantly alter the transportation charges that are volumetrically based. That particular analysis is beyond the present capacity of this model. If such savings are substantial and if the applicant believes that the use of an average gas price significantly understates the potential savings of your ECM, then you should contact the DGS representative for further instructions.

- **Rows 31-40:** This section concerns the amount of energy savings predicted for the ECM. You may enter these data in either of two ways depending on the information you have available and the manner in which the energy audits compiled the savings data:

If the energy audit specifically identified the amount of gas used in the business as usual case before implementation of the ECM (the “business as usual” case) and the amount of gas used after the ECM’s implementation (the “ECM” case), then you should enter both amounts as follows:

- **Row 37:** Enter the business as usual usage in the ECM's column.
 - **Row 40:** Enter the usage after the efficiency measures are installed in the ECM’s column.
 - The model will calculate the difference as the energy savings.
- If the energy audit only identifies the energy savings:
 - **Row 37:** Enter the savings (therms) in the relevant column.
 - **Row 40:** Make no entry under “ECM.”
 - The model will treat the “business as usual” amount as the therms saved.

4.4 ECMs that Save Electricity (Rows 42-125)

This section is split into two categories: ECMs that save electricity A) under non-TOU tariffs and B) under TOU tariffs.

- **Row 49:** You must indicate Y or N to the “TOU?” prompt. This switch is used in the “ECM Analysis” sheet to calculate energy savings.
- **Row 50:** Indicate whether your electricity tariff has a demand ratchet. If you indicate that the tariff has a demand ratchet, then any first-year demand savings will be zero. (The model assumes that if a demand ratchet exists, the demand ratchet is for 12 months; i.e. the current and eleven previous months.)

A. Data for Electrical ECMs on Non-TOU Tariffs (Rows 55-77)

- **Row 59:** Enter the electric utility tariff number (from Row 8 on “Tariffs” worksheet).
- **Rows 66-77:** Enter electric usage and demand. As explained under “ECMs that Save Gas,” you may enter both “business as usual” (i.e., usage without the ECM) and “ECM” use (i.e., usage after the ECM is implemented) if both are available. If both are not available (i.e., only “savings” is available), then you should enter the estimated *savings* under the “business as usual” case.

B. Data for Electrical ECMs on TOU Tariffs (Rows 80-125)

- **Row 84:** Enter the electric utility tariff number (from row 24 of the “Tariffs” sheet).
- **Rows 94-125:** Enter energy use data. If the data for both pre-ECM “business as usual” and post-ECM (“ECM”) are available, you should enter both. If the data does not exist, you must enter the electricity savings in the “business as usual” section.
- **Rows 101-107:** For demand (kW) data, you need only to enter demand data for time periods that are used in the applicable tariff. Most utilities only charge for demand in the peak and part peak periods. The model includes off-peak demand categories to provide flexibility for the rare tariffs that bill for off-peak demand.

4.5 Capital Costs and Financing (Rows 127-143)

ECM Capital Costs

For each ECM, you will input the capital costs, including construction, overhead, contract management, IDC (Interest During Construction), and any rebates.

- **Row 131:** Enter the date of the construction estimate.
- **Row 132:** Enter the number of months from the construction estimate until the construction start. The model assumes that the construction estimate is a current estimate and that the actual cost will be escalated until the start of construction.
- **Rows 133-134:** Enter construction cost and “soft costs.” These costs are escalated at CPI for the number of months until the construction start.
- **Row 136:** Enter any rebates.
- **Row 137:** You have the option of calculating capitalized interest outside the model or allowing the model to perform a simple calculation of it. In row 137, input “Y” if you prefer to calculate it yourself.
- **Row 138:** If you selected "Y" in Row 137, then input the amount of capitalized interest in row 138.

ECM Debt

Since it is expected that the ECMs in each Project will be financed as a group, input the data for all ECMs in Column J for "General Inputs" as follows:

- **Row 141:** Enter the percentage of the ECM costs that will be debt financed (usually 100%).
- **Row 142:** Enter the term of the debt (years).
- **Row 143:** Enter the expected interest rate.

The financing inputs are common to all ECMs in the Project. However, since you have input the capital cost for each individual ECM, you will easily be able to analyze different combinations of ECMs.

The term of debt should be limited to no more than 15 years (ideally between 5 and 10 years). Any Project seeking financing for a longer term will be evaluated on a case by case basis. For information regarding the expected interest rate go to the GS\$Mart website at www.pd.dgs.ca.gov/gsmart.

4.6 Operating & Maintenance and Other Costs (Rows 145-164)

ECM Expenses:

- **Row 148:** Enter an annual O&M expense.
- **Rows 150-151:** If the ECM will have major periodic repairs and replacements at predictable intervals of two years or greater, you may either:
 - include the annualized costs in routine O&M above, or
 - enter the expected cost of any such major repairs, overhauls and replacements and the average frequency (in years) that that this major repair/replacement is expected to occur.

If you choose the latter approach, the model will treat these major replacements and repairs on a cash flow basis. For example, if you expect a major overhaul to happen every three years at a cost of \$20,000, the model will show \$20,000 in expense every third year. The amounts entered will be escalated at the default rates on the "DGS Inputs" sheet.

Expenses Avoided by ECM

- **Rows 145-148:** If O&M expenses and major repairs and replacements are avoided by the ECM's operation, these expenses are entered here. You should exercise considerable care before entering any numbers here, as such avoided expenses are often hard to document. These values will be closely scrutinized for validity.

- **Rows 163-164:** If the ECM has any other incremental costs associated with it, such as G&A, insurance, etc., these can be entered in row 163 (or 163 and 164 if you have both pre-ECM and post-ECM data.)

HOW TO RUN THE MODEL

After you have entered all of the ECM data in Sections 4.2 through 4.6, you may proceed to Section 4.1 below for the selection of ECMs and instructions on how to run the model.

4.7 Selection of ECMs (Rows 2-6)

In this section, you will select the ECMs for testing in various Projects after all of the ECM data has been entered.

A two-step process is required to run the model and generate outputs:

1. Run the Model

- **User Inputs sheet, Cell G6:** If you only want to test one particularly ECM, enter in cell G6 the corresponding identification number for that ECM, which was entered in row 9. If you want to test a combination of ECMs in a “Project,” enter in cell G6 the numbers of all the ECMs in the Project that you want to include in the Project for the particular test case. The ECM numbers for input into Cell G6 are the numbers indicated in row 9 that identify each ECM. **After all ECM data are entered, G6 will be the most used cell in the model as you test different scenarios.**
- You can specify any combination of ECMs to include in a particular test run by entering the combination of ECM numbers in cell G6. You can easily run a cash flow analysis on various combinations of ECMs.
- ECM numbers in G6 must be separated by commas but consecutive ECMs numbers may be entered with a dash (e.g., 2,5-8,15 would combine ECMs 2, 5, 6, 7, 8 and 15 in a “Project” to run).

2. Generate Outputs

- Go to the “Project Analysis” sheet
- Click the “Accumulate Results” button in Row 1 under columns J, K and L. **The model does not run until you click on the “Accumulate Results” button.**
- You may print the following outputs by clicking the appropriate button at the top of the “Project Analysis” worksheet or by printing the appropriately labeled worksheet:
 - A Summary of the Project (i.e., group of ECMs) that you just tested in your current run (separately labeled worksheet “Project Summary Printout”),

- A Summary of the Individual ECMs in your current run, and
- Sensitivity Tables showing the potential variability of savings as factors such as project costs or utility prices vary from the base case assumptions used in the model (separately labeled worksheets “Sensitivity Table 1” and “Sensitivity Table 2”).

5 “Project Analysis” Worksheet

This worksheet requires no inputs other than hitting the “Accumulate Results” button at the top of this sheet.

Printing Results

You may print summary results from the top of this page by clicking the buttons adjacent to the “Accumulate Results” button. You can print a Summary of the Individual ECMs, a Summary of the Project made up of the individual ECMs you selected for this run, or the corresponding Sensitivity Tables. Refer above to “Generate Outputs” for instructions.

Project Cash Flow

The “Project Analysis” worksheet adds up the individual ECM analyses from “ECM Analysis” to yield a cash flow for the Project. A summary of cash flow savings information for the project is presented in three forms:

- **Present Value** – This column adjusts the savings for the time value of money, which means that it discounts future savings into today’s dollars.
- **Sum** – This column is a total of the savings added over the analysis period with no adjustment for inflation.
- **First Year Savings** – This column shows the savings in the first year. The first year column *may be deceptive* if all ECMs in the project don’t start in the same year.

The cash flow statement is split into Energy Cost Savings from natural gas, electricity usage (kWh), and electricity demand (kW). Incremental project costs, including operating costs and expenses avoided by the project, are subtracted from these savings. The savings are then adjusted for debt service.

Economic Metrics

This summary sheet supplies three economic metrics for the project:

- **Payback period** – This tells you in which year the initial investment is recovered.
- **Debt coverage ratio (DCR)** – The debt coverage ratio is the total cash savings divided by the debt service payments. It is an indicator of whether or not the

- project generates sufficient cash flow to cover its debt. The output supplies both the average and minimum debt coverage ratio over the term of the debt.
- **Internal rate of return (IRR)** – The internal rate of return is the discount rate which makes the net present value of the income stream = 0. This is the unleveraged IRR, as the calculation would produce an infinite IRR if a Project is 100% debt financed.

Sensitivity Table

This table indicates how variations in the escalation of electric (or gas) prices will impact your Project's Net Present Value Savings, Nominal Savings, and Payback Period. The center row (highlighted in yellow) is the base case. The rows above it are sequential subtractions from the base case assumption as to real price escalation (or de-escalation) compared to CPI and the rows below it are sequential additions from the base case assumption using, in each instance, the intervals as specified in the "Table Interval" cell, located in Cell P222 on the ECM Analysis sheet, highlighted in light green. You may change the Table Interval to see either a finer or broader spread in escalation rates. As the sensitivities for the Project are by definition based on the sensitivities of the Individual ECMs grouped into the Project, the Sensitivity Table on the Project Analysis sheet is simply carried over from the ECM Analysis sheet and any changes to the Table Interval must be made on the ECM Analysis sheet. Please note that when you make a change in the Table Interval on the ECM Analysis sheet, the change in table intervals will display automatically on the ECM Analysis sheet; however to generate all of the updates on the Project Analysis sheet, you must click the AccumulateResults button at the top of the Project Analysis sheet to fully update that sheet's Sensitivity Table.

VERY IMPORTANT: Do not change any numbers in either of the Sensitivity Tables other than the Table Interval in Cell P222 on the ECM Analysis sheet. The Base Case CPI (inflation rate), Base Case Real Electric Escalation rate and Base Case Real Gas Electric Escalation rate are all determined by DGS and should not be altered.

6. “ECM Analysis” Worksheet

This worksheet does not require any inputs.

The “ECM Analysis” worksheet is the engine of the model. It does almost all of the calculations. This sheet analyzes one ECM at a time. To analyze a portfolio, the model analyzes each ECM alone and adds the results to arrive at the Project results in “Project Analysis.”

“ECM Analysis” prepares a cash flow for each ECM by calculating the incremental energy savings, incremental ECM costs, the savings before debt service, and the savings after debt service for each year of the analysis period in rows 105 through 124. The “Accumulate Results” macro pastes and adds the values in this region into the “Project Analysis” sheet.

The results for each individual ECM are summarized over the analysis period, both in present value and nominal terms, at the top of the sheet in rows 6 through 45. The “Accumulate Results” macro copies these results to the “Summary of Ind. Proj.” sheet.

NOTE: You can only obtain an individual ECM’s results when you run that ECM alone in “User Inputs” cell G6. You should pay special attention to the title of “ECM Analysis” sheet to make sure that the results are for the desired ECM.

Sensitivity Table

This table indicates how different assumptions regarding the rate of real escalation (or de-escalation) in electric (or gas) prices will impact your Individual ECM's Net Present Value Savings, Nominal Savings, and Payback Period. Note that “real” escalation refers to the rate of change above or below the rate of background inflation (i.e., CPI).

The center row (highlighted in yellow) shows the results under base case assumptions. The rows above it are sequential subtractions from the base case and the rows below it are sequential additions from the base case assumptions regarding the “real” escalation in energy prices using, in each instance, the intervals as specified in the "Table Interval" in Cell P222, which is highlighted in light green. You may change the Table Interval to see either a finer or broader spread in escalation rates.

VERY IMPORTANT: Do not change any numbers in the Sensitivity Table other than the Table Interval in cell P222. See explanation for these figures above in "Project Analysis – Sensitivity Tables."

7. “Summary of Individual ECMs in a Project” Worksheet

This worksheet does not require any inputs.

This “Summary of Ind. ECM” worksheet displays a summary of each ECM in the portfolio. The macro copies the summary from the “ECM Analysis” sheet.