

## Instructions for MAC CHP Assessor



The information used in the MAC CHP Assessor represent the best efforts by the Midwest CHP Application Center as of the time of publication. The Assessor should be utilized only for screening and estimating purposes. It is NOT intended as a tool for developing detailed CHP designs or cost estimates.



Cells highlighted in **yellow** on this worksheet need to be completed by the user. The Appendix provides a list of information that should be collected for use in the CHP Assessor Tool.

**Open** CHP Assessor spreadsheet and when prompted **Click** on “*Enable Macros*”.

- **Click** on lower tab marked “*Enter Here – Procedure*”

This sheet presents the 4 major steps in this program as macros:

Step 1: Data Entry

Step 2: Calculates and Displays the Results of the Baseline Analysis

Step 3: Selection of CHP Equipment

Step 4: Calculates and Displays the Results of the CHP Analysis and Presents the Estimated Annual Savings Over the Baseline System

You will be directed through the program by clicking on the 4 boxes that represent the 4 major steps and associated boxes on subsequent sheets will direct you back to this “*Procedure*” worksheet.

**Step 1:** Cursor over the box marked “*Step 1 – Enter Data*” until “*Hand Pointer*” appears, then **Click** on the box. You will be taken to the “*Site Data*” sheet.

- Enter information requested in **yellow** fields. See Appendix for guidance on what information you will need to obtain.
- When all information is entered, cursor over the box marked “*Step 2*”, then **Click** on the box. You will be taken back to the “*Enter Here – Procedure*”

**Step 2:** Cursor over the box marked “*Step 2 – Click Here to Calculate Baseline Information*” until the “*Hand Pointer*” appears, then **Click** on the box.

- The baseline information will be evaluated and you will be taken to the “*Baseline Report*” sheet. There is NO data entry required on this sheet.

The “*Baseline Report*” provides 1) “*Baseline Electric Energy Usage*” chart that reflects the 12 months of information provided on energy and demand usages, 2) a table that repeats the energy related information that was entered on the “*Site Data*” sheet, and 3) “*Baseline Electric & Thermal Load Profile*” that includes a recommended generator size line to show what size the program recommends based on the baseline electric load profile.

- The “*Baseline Report*” sheet can be printed out if desired.

- c) Cursor over the box marked “Step 3” until the “Hand Pointer” appears, then **Click** on the box. You will be taken back to the “Enter Here – Procedure”

**Step 3:** Cursor over the box marked “Step 3 – Click Here to Select CHP Equipment” until “Hand Pointer” appears, then **Click** on the box. You will be taken to the “Equipment” sheet.

Review the information and recommendation from the top and enter information requested in **yellow** fields.

- a) Estimated Hours of Operation

- **Enter** the planned hours that the prime mover, absorption chillers (if to be used), and desiccant system (if to be used) will be operated. **Click** on the cell to see guidance on estimating the operating hours for each respective technology.

- b) Prime Mover

- **Review** the recommendations for prime mover technology type. The recommendations are based on the Thermal to Electric ratio shown at the top of the sheet.
- **Select** the type of prime mover desired.
- **Indicate** “Yes” if backup generation would have been installed anyway. If “Yes”, indicated planned size that the backup generator would have been. This information provides for estimated equipment credit to be applied to the CHP system cost.
- **Choose** the size and number of generators. Recommended generation capacity is provided on the sheet. Based on the size and type of prime mover selected, the program will provide additional information and evaluate various parameters for the prime mover chosen, and display them on the sheet.

- c) Absorption Chiller

- **Enter** “Yes” if an absorption chiller is to be included.
- **Indicate** “Yes” if the absorption chiller will displace any electrical chiller(s). If “Yes”, this information provides for estimated equipment credit to be applied to the CHP system cost and displaced electricity.
- The program will calculate the amount of tonnage of cooling based on the estimated usable heat output from the prime mover. It also calculates the other parameters based on the size of the absorption chiller. **Review** the information that is provided.

- d) Desiccant Dehumidifier

- **Choose** “None” if a desiccant system will NOT be installed, otherwise choose desiccant type: “Solid” or “Liquid.”
- **Indicate** “Yes” if a desiccant system would have been installed anyway. This information provides for estimated equipment credit to be applied to the CHP system cost.

- **Choose** the size and number of desiccant unit. Based on the size and type of desiccant, the program will provide additional information and evaluate various parameters for the desiccant chosen, and display them on the sheet.
- e) Total Electric Displaced by Non-Electric Chillers
- **Review** the information that is calculated by the program.
- f) Costs
- **Enter** the actual installed cost of each CHP system component, if known. If not known, the program will estimate the installed cost of the CHP system.
- g) Parasitic Electricity Use
- **Enter** the actual parasitic electric load of each CHP system component, if known. If not known, the program will estimate the parasitic electric load of the CHP system.
- h) **Cursor over** the box marked “*Step 4*” until the “Hand Pointer” appears, then **Click** on the box. You will be taken back to the “*Enter Here – Procedure*”
- Step 4:** **Cursor over** the box marked “*Step 4 – Click Here to Calculate CHP Results*” until the “Hand Pointer” appears, then **Click** on the box.
- d) The CHP information will be evaluated and you will be taken to the “CHP Report” sheet. There is NO data entry required on this sheet.
- The “CHP Report” provides the assumptions, electrical and thermal usage and results, annual savings, simple payback, and the average cost per kWh. It also graphically displays monthly electric use, average electric demand profile and generator production, comparison of generation to CHP electric production, and thermal demand verses generator useful thermal production.
- e) The “CHP Report” sheet can be printed out if desired.

## Appendix: Information to Be Collected for Entry into CHP Assessor

### Information that MUST be entered for program to run

- CHP Classification: Commercial, Institutional, or Industrial site.
- Obtain most recent 12 months of electric and fuel bills.
- Is #2 or #6 Fuel Used?
- Is Electric Sell Back Desired? Yes or No
- Do Peak Electric Rates Apply? Yes or No
- Standby Demand Charge If applicable (\$/kW)
- What is Electric Sell Back Price? If electricity is to be sold back, the rate (¢/kWh) to be received for electricity sold needs to be obtained.
- What is the CHP Fuel Cost? The cost of fuel may be lower when larger quantities are used, such as with a CHP system.
- What is Existing Boiler Efficiency? If there are multiple boilers, use average value. If unknown, assume 80%.