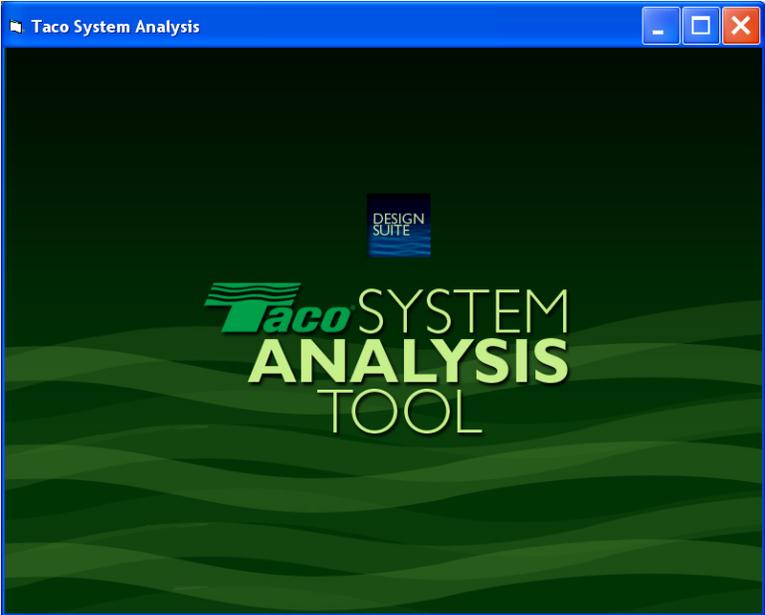


QUICK START GUIDE



Taco System Analysis Tool

Quick Start Guide

Contents

Help Resources	3
Getting Started Pictorial	4
Installing Taco System Analysis Tool	12
Opening Taco System Analysis Tool for the first time	13

HELP RESOURCES

The purpose of this manual is to briefly introduce the user to the capabilities of the Taco System Analysis Tool. For additional detailed help refer to the following resources:

Topic Help: Choose “Help”, “Contents” on the main menu bar.

Web Based Help: Log on to www.taco-hvac.com.

E-mail Based Help: tacohs2@taco-hvac.com

Taco Hydronic System Solutions contact information:

Phone: (800) 441-1969 TacoNet User Support

Phone: (877) 477-8226 Taco HS2 User Support – 877-HSS-TACO

Fax: (561) 325-2791

Getting Started Pictorial.

1. Project Screen

Basic project data is entered in the “Project” screen. This includes job name, location, etc. as well as climatological data, building dimensions, heat loss and heat gain data, and energy cost data. The user can also select predefined systems for each of the 4 systems that can be compared.

The screenshot shows the 'Taco System Analysis Tool' software window. The title bar indicates the file path: 'C:\Documents and Settings\GREG_CM\My Documents\Taco Software\S...'. The interface includes a menu bar (File, Edit, Help) and a tabbed interface with tabs for 'Project', 'System 1', 'System 2', 'System 3', 'System 4', and 'Cost Comparison'. The 'Project' tab is active, displaying several input sections:

- Project:** Fields for Project name (BASELINE TEST), Location, Engineer, and Date.
- Costs:** Fields for Electricity Demand (7.00 \$/Kwh), Electricity Consumption (.07 \$/Kwh), Fossil Fuel Oil (.70 \$/Gal), Fossil Fuel Natural Gas (.80 \$/Therm), and Fossil Fuel Propane (1.00 \$/Gal).
- Nearest Climatological Data Location:** Dropdown menus for State (RI) and City (PROVIDENCE).
- Building Dimensions:** Fields for Building Length (100), Floor Height (10), Perimeter Width (15), Building Width (100), and Number of Floors (1).
- Heat Loss:** Radio buttons for Default (selected) and User. Fields for Total Heat Loss (2500000 BTU), Ventilation Loss (88000 BTU), and Envelope Heat Loss (2402000 BTU).
- Heat Gain:** Radio buttons for Default (selected) and User. Fields for Total Heat Gain (3000000 BTU), Ventilation Sensible Gain (19600 BTU), Ventilation Latent Gain (26249 BTU), People Heat Gain (20000 BTU), Light Heat Gain (68000 BTU), Equipment Heat Gain (34000 BTU), and Envelope Heat Gain (2832151 BTU).

Project Box

Enter Basic project information as follows:

- Project:** Enter the name of the project.
- Location:** Enter the location of the project.
- Engineer:** Enter the name of the engineer.
- Date:** Enter the date.

Nearest Climatological Data Location Box

The program calculates energy consumption from NOAA (National Oceanic and Atmospheric Administration) data. Pick the nearest climatological location to the project location as follows:

State: Choose the nearest state to the project location.

City: Choose the nearest city to the project location.

Building Dimensions Box

The building is modeled as a cube. Enter building dimensions that best model the building as a cube.

Building Length: Enter the building length in feet.

Building Width: Enter the building width in feet.

Floor Height: Enter the average floor to floor height.

Number of Floors: Enter the number of floors.

Perimeter Width: The program models the building as 2 zones, an exterior zone and an interior zone. This allows the user to select different HVAC systems for the exterior and interior of the building. "Perimeter Width" defines the depth of the exterior zone that is influenced by the heat transfer through the envelope or skin of the building. For a building with an "open" plan, or no partitions, this is approximately 15 ft. For a building with partitioned rooms this would be the depth of the exterior rooms.

Heat Loss Box

This box is used to enter the building's heat loss. The heat loss can be entered one of two ways, either as a total or as a breakdown by components. If a total heat loss is entered the program will calculate the component breakdown using assumptions of ventilation rates, etc. If the component breakdown is entered the program will sum the components to a total heat loss.

To enter a total heat loss choose the "Default" option and enter data as follows:

Total Heat Loss: Enter the building total heat loss in btu/hr.

To enter component breakdowns choose the "User" option and enter data as follows:

Ventilation Heat Loss: Enter the ventilation (outside air) heat loss in btu/hr.

Envelope Heat Loss: Enter the heat transfer or heat loss through the envelope or skin of the building in btu/hr.

Heat Gain Box

This box is used to enter the building's heat gain. The heat gain can be entered one of two ways, either as a total or as a breakdown by components. If a total heat gain is entered the program will calculate the component breakdown using assumptions of ventilation rates, number of lights, people, etc. If the component breakdown is entered the program will sum the components to a total heat gain.

To enter a total heat gain choose the "Default" option and enter data as follows:

Total Heat Gain: Enter the building total heat gain in btu/hr.

To enter component breakdowns choose the "User" option and enter data as follows:

Ventilation Sensible Heat Gain: Enter the sensible portion of the ventilation (outside air) heat gain in btu/hr.

Ventilation Latent Heat Gain: Enter the latent portion of the ventilation (outside air) heat gain in btu/hr.

People Heat Gain: Enter the total heat gain of the people in the building in btu/hr.

Light Heat gain: Enter the heat gain of the lights in the building in btu/hr.

Equipment Heat Gain: Enter the heat gain of the equipment in the building in btu/hr.

Envelope Heat Gain: Enter the heat transfer or heat gain through the envelope or skin of the building in btu/hr.

Costs Box

This box is used to enter the costs of energy sources (electricity and fossil fuels). Enter the costs for these energy sources as follows:

Electricity Demand: Enter the cost per kilowatt of demand in dollars.

Electricity consumption: Enter the average cost per kilowatt-hr of electricity consumption in dollars.

Fossil Fuel Oil: Enter the average cost of fuel oil in dollars per gallon (150,000 btu/hr).

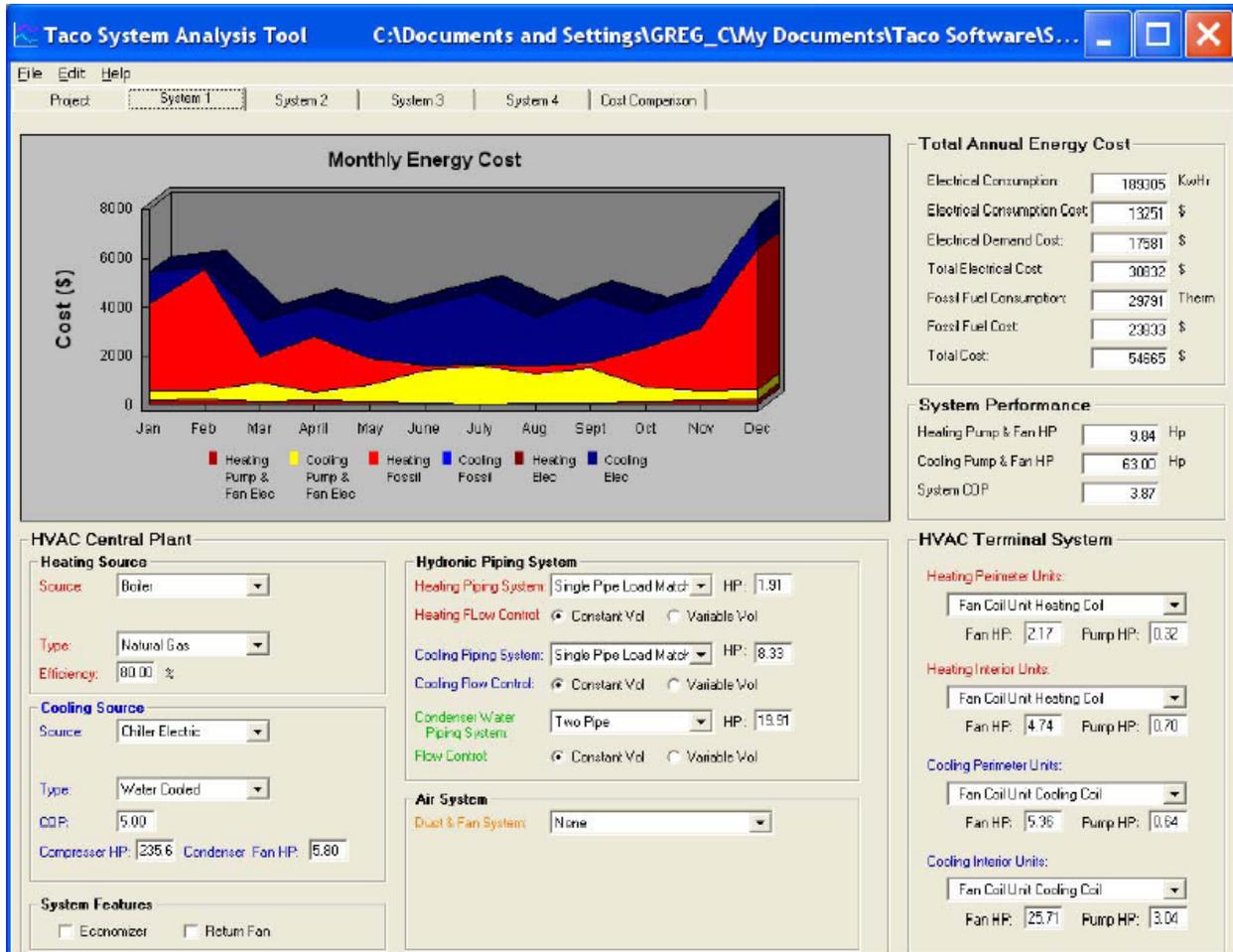
Fossil Natural Gas: Enter the average cost of natural gas in dollars per therm (100,000 btu/hr).

Fossil Propane: Enter the average cost of propane in dollars per gallon (90,000 btu/hr).

2. System Screen

Systems are modeled using the “System Screens”. Up to 4 systems can be modeled for comparison at one time. A System Screen is broken into 3 areas for data input. These 3 areas are used to choose the heating and cooling source, piping and duct distribution systems, and the type of terminal units for each system to be modeled. The boxes for these 3 components move from left to right on the screen.

The heating and cooling sources are chosen in the “Heating Source” and “Cooling Source” boxes on the lower left of the screen. The piping and duct distribution systems are chosen in the “Hydronic Piping System” and “Air System” boxes in the lower center of the screen. The terminal units are chosen in the “HVAC Terminal System” box on the lower right of the screen.



The results of the system modeled in each screen are immediately displayed in the “Monthly Energy Cost” window in graphical format in the upper left of the screen or numerical format in the upper right of the screen. Additional information is presented in the “System Performance” box summarizing installed horsepower’s for pumps and fans as well as the System Cooling COP.

HVAC Central Plant Box

Heating Source Box

The source of heating energy is selected in this box. Enter the data for the heating system as follows:

Source: Choose the primary source of heating.

Type: Choose the type of fuel.

Efficiency: To enter an efficiency other than the default efficiency double left click on the efficiency window choose “Allow User Update” and choose OK. Enter the new efficiency. The background color will change to red indicating that a user update has been entered.

Total Annual Energy Cost

Electrical Consumption	189305	Kwhr
Electrical Consumption Cost	13251	\$
Electrical Demand Cost	17581	\$
Total Electrical Cost	30832	\$
Fossil Fuel Consumption	29791	Therm
Fossil Fuel Cost	23633	\$
Total Cost	54465	\$

System Performance

Heating Pump & Fan HP	9.84	Hp
Cooling Pump & Fan HP	63.00	Hp
System COP	3.87	

HVAC Terminal System

Heating Perimeter Units: Fan Coil Unit Heating Coil, Fan HP: 2.17, Pump HP: 0.32

Heating Interior Units: Fan Coil Unit Heating Coil, Fan HP: 4.74, Pump HP: 0.70

Cooling Perimeter Units: Fan Coil Unit Cooling Coil, Fan HP: 5.36, Pump HP: 0.64

Cooling Interior Units: Fan Coil Unit Cooling Coil, Fan HP: 25.71, Pump HP: 3.04

Cooling Source Box

The source of cooling energy is selected in this box. Enter the data for the cooling system as follows:

Source: Choose the primary source of cooling.

Type: Choose the type of heat rejection or heat sink.

COP: The COP (Coefficient of Performance) of a cooling system is a measure of its' efficiency. It is the dimensionless ratio of the cooling produced by the system divided by the work in. To enter a COP other than the default COP double left click on the COP window, choose "Allow User Update" and choose OK. Enter the new COP. The background color will change to red indicating that a user update has been entered.

Condenser Fan Horsepower: To enter a condenser fan horsepower other than the default COP double left click on the COP window, choose "Allow User Update" and choose OK. Enter the new Condenser fan horsepower. The background color will change to red indicating that a user update has been entered.

Hydronic Piping System Box

The type of hydronic piping system is selected in this box.

Heating Piping System: Choose the type of heating water piping system.

Heating Flow Control: Choose the type of heating water flow control, constant or variable volume.

Cooling Piping System: Choose the type of cooling water piping system.

Cooling Flow Control: Choose the type of cooling water flow control, constant or variable volume.

Condenser Piping System: Choose the type of condenser water piping system.

Condenser Flow Control: Choose the type of condenser water flow control, constant or variable volume.

Central Air System Box

The type of central air handling fan and duct system is selected in this box. This air handling system is for a central fan system only. The air handling system for a terminal unit or zone is selected in the HVAC Terminal System box. For instance, if a central VAV system is desired than the type of fan and duct system would be selected in this box as a "Single Duct Single Fan". If a fan coil system is desired, where the fan and duct system is installed in the zone only with no central air handling unit and duct system, then this selection would be "none".

Duct and Fan System: Choose the type of central fan and duct system. If a 100% outside air ventilation system only is desired choose “Single Duct Single Fan Vent. Only”.

HVAC Terminal System Box

Different HVAC systems can be modeled for the perimeter (exterior) and interior of the building as follows:

Heating Perimeter Units: Choose the type of heating terminal unit for the perimeter (exterior) zone of the building.

Heating Interior Units: Choose the type of heating terminal unit for the interior zone of the building.

Cooling Perimeter Units: Choose the type of cooling terminal unit for the perimeter (exterior) zone of the building.

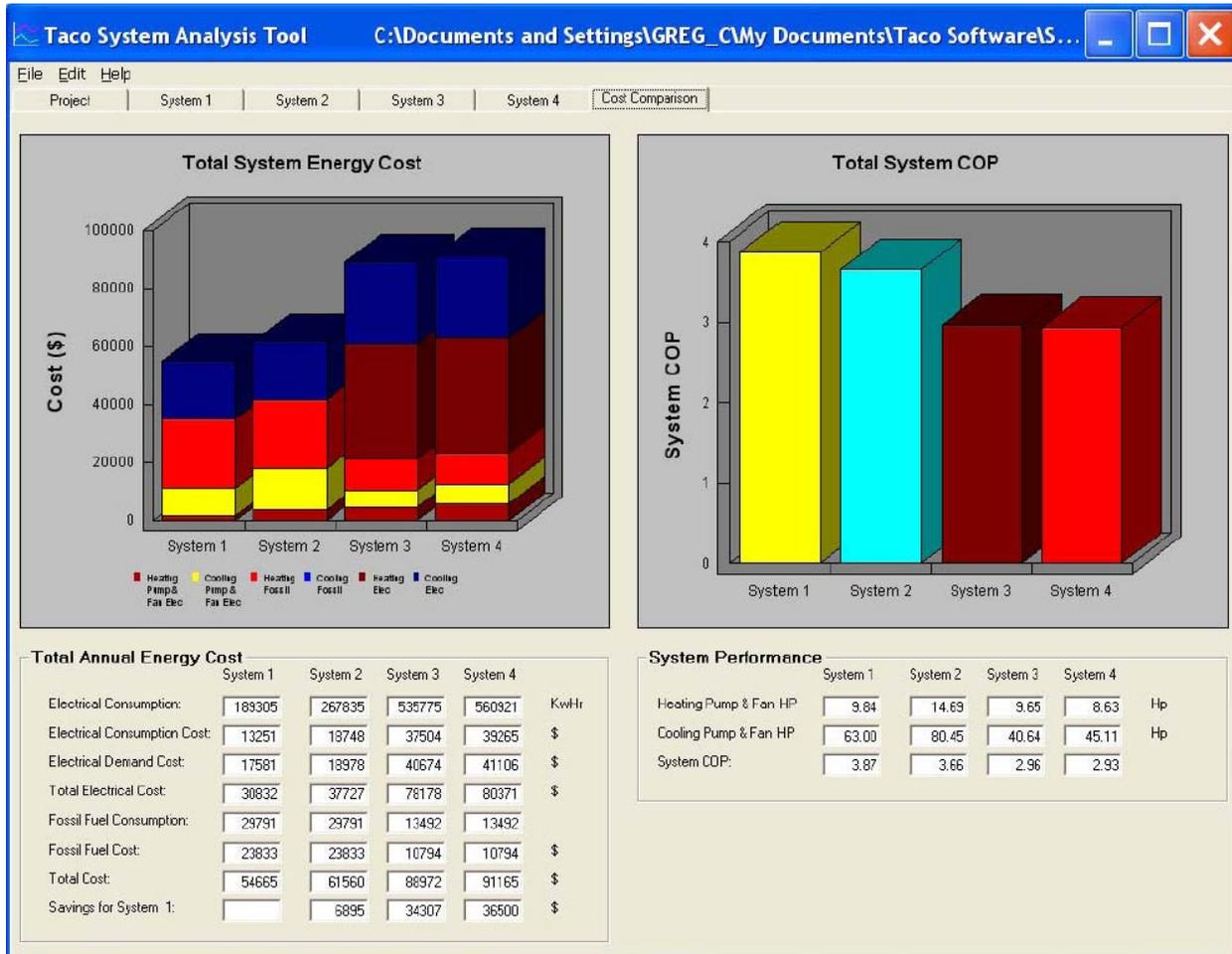
Cooling Interior Units: Choose the type of cooling terminal unit for the interior zone of the building.

Cost Comparison Screen

The Cost Comparison screen provides a quick and comprehensive comparison of systems that have been modeled, all on one screen. Unlike some other energy analysis software, the user does not have to search several screens to get a comprehensive comparison of the systems modeled.

The information presented compares not only energy consumption and costs, but also system parameters such as pump and fan horsepower's as well as a Total Cooling System COP. This information on system horsepower and COP's is useful in evaluating installed horsepower's and system electrical first costs.

Energy cost comparisons are shown on the bar graph and tabular data on the left of the screen. Cooling system COP and pump and fan horsepower comparisons are shown on the bar graph and tabular data on the right of the screen.



Installing Taco System Analysis Tool

System Requirements

The Taco System Analysis Tool is designed to run on Windows operating systems from Windows 98 on. Your PC should have a 500 MHz processor or greater. We recommend a screen resolution of at least 1024x768.

Installing Taco System Analysis Tool

Step 1: Insert the Taco System Analysis Tool CD-ROM into your CD/DVD drive on your PC.

Step 2: Follow prompts until you are finished installing the software.

If Setup does not start automatically when you insert the CD:

Step 1: On the Windows taskbar, click **Start**.

Step 2: Click **Run**.

Step 3: In the **Open** box, type the drive letter for your CD-ROM /DVD drive, followed by a colon (:), a backslash (\), and **setup**. For example, if your CD-ROM / DVD drive letter is d, you would type **d:\setup**.

Step 4: Click **Ok** and follow the instructions on the setup screen.

Uninstalling Taco System Analysis Tool

Step 1: Go to **Start > Control Panel > Add or Remove Programs**.

- In some operating systems, you will find - **Start > Settings > Control Panel**.

Step 2: Select Taco System Analysis Tool in the Add or Remove Programs window and click "remove".

Step 3: The operating system may ask if you want to remove specific files. Other programs may share these files. If you are unsure, always opt to keep these files.

Opening Taco System Analysis Tool for the first time!

Now that we are ready to start analyzing your first system, let us begin by opening the program.

There are two ways to open up the software program:

- You can go to your desktop and double click on the Taco System Analysis Tool icon
- You can also go to the **Start > All Programs > Taco Design Suite>** then **> System Analysis**
- For some operating systems, you will find - **Start > Programs > Taco Design Suite > System Analysis.**

The System Summary Screen will be the first to be displayed. To get a quick feel for how the program operates, load a typical project from the samples directory as follows.

Click on the **File > Open** menu and navigate to the samples directory in the **Taco Design Suite\System Analysis\Samples** directory. Highlight one of the project files listed and click OK. This will load the project and display the selections and calculations for System 1 in that project. Click on the Project tab to display information about the location of the project, building size, heat loss and gain and energy costs. Click on the other System tabs to view the 3 other system designs for the building that are under consideration. Then click on the Cost Comparison tab to view the results of the analysis