

Right Sizing AC Systems for Profit and Energy Star Certification

RESNET 2007

Dennis J Stroer

CALCS-PLUS

Venice Florida

CALCS-PLUS

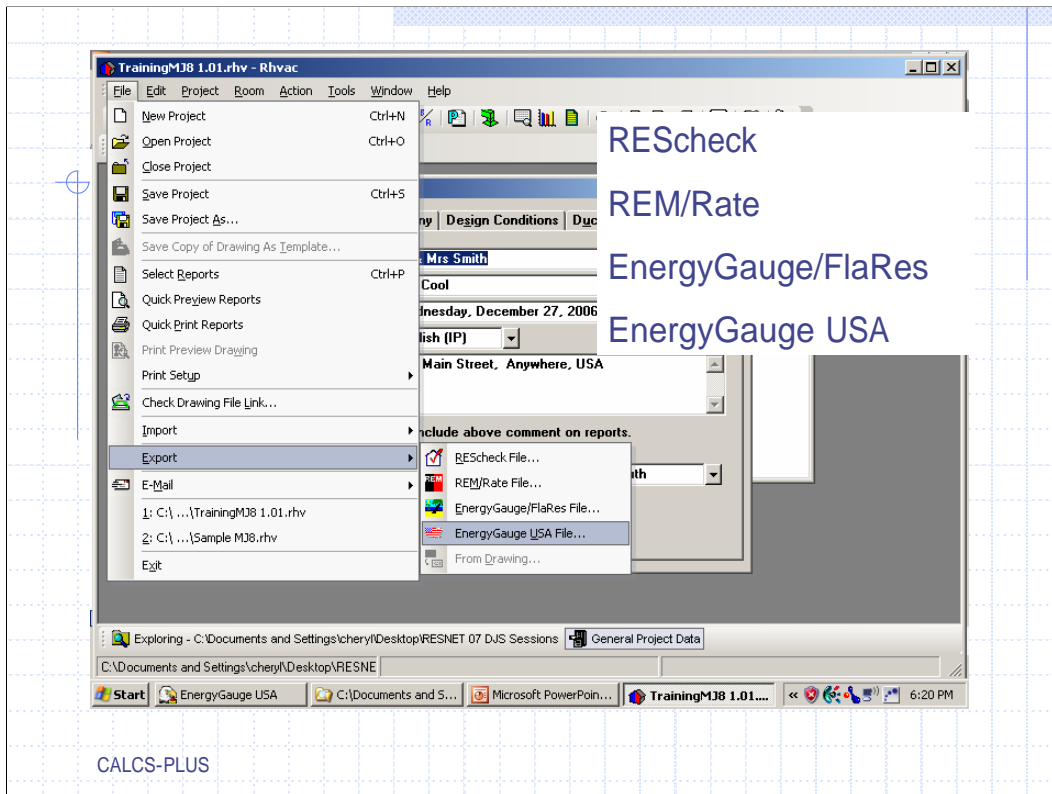
Manual J – Rating Software

Converting the Load Calculation
into a rating

Elite Software
RHVAC RESIDENTIAL
HVAC LOADS

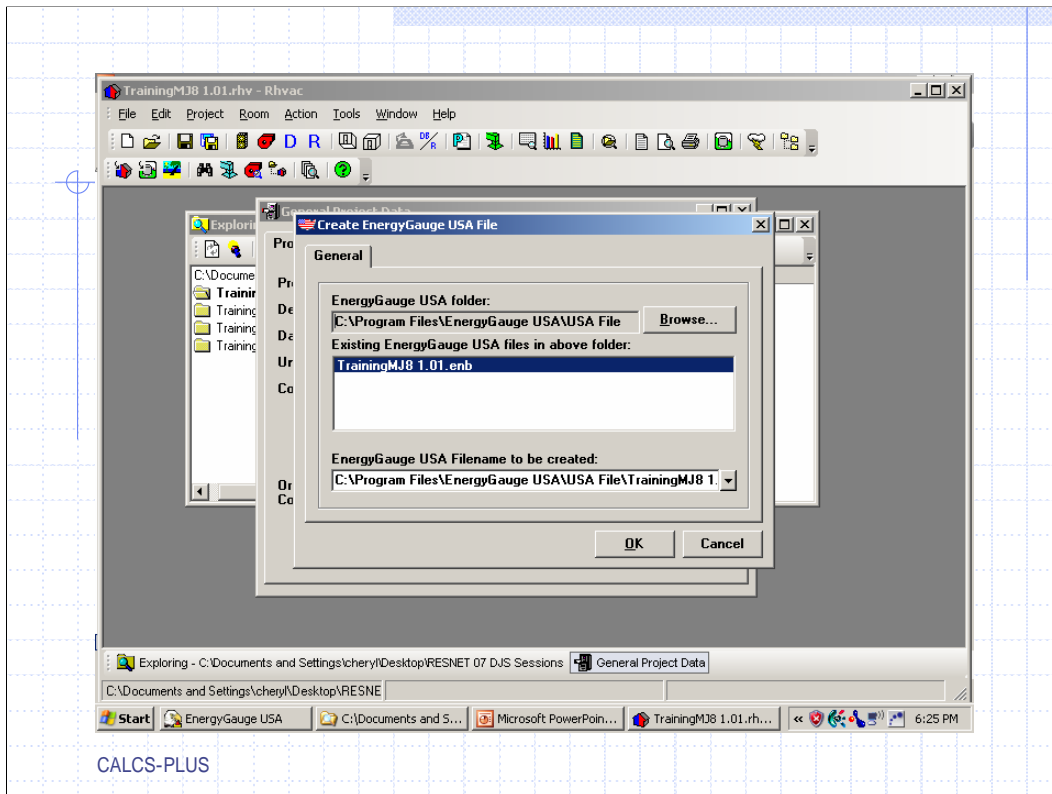


CALCS-PLUS



The state of Florida mandates that we use Energy Gauge USA for ratings so we will use this program for our example but as you can see the program also exports files to REScheck, REM/Rate, & Energy Gauge / FlaRes which is the energy code software for Florida.

Select Export and then the rating software you are exporting to.



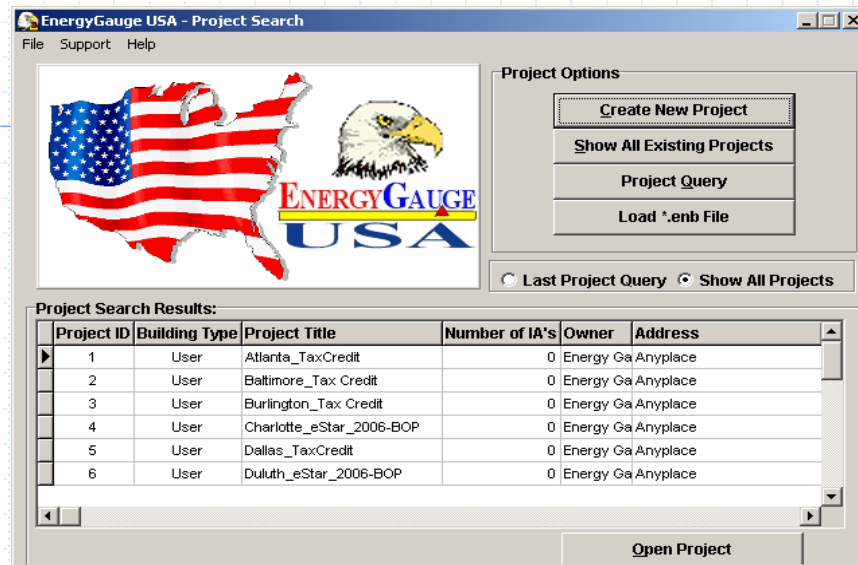
Energy Gauge USA uses a .enb file. We keep these files in a separate folder on our computer and re name them when we open them in our rating software, after the rating is complete we file them in a folder under the builder's name.

>> EnergyGauge USA Export Warning: After importing the ENB file into EnergyGauge USA, be sure to check the project thoroughly and fill in all the missing data. For example, on the Climate tab of the Site tab you will need to select your weather design city.

>> EnergyGauge USA Export Warning: Note that the description inputs for floors, ceilings, walls, doors and windows in EnergyGauge USA will each include the following data: Manual J material code, a comma, then the room number, a dash and the item number. If based on more than one item, the additional room and item numbers will follow. For example, a floor with description "20P-19,1-1,2-1" would be from two instances of floor 20P-19, where one was floor 1 in room 1 and the other was floor 1 in room 2.

CALCS-PLUS

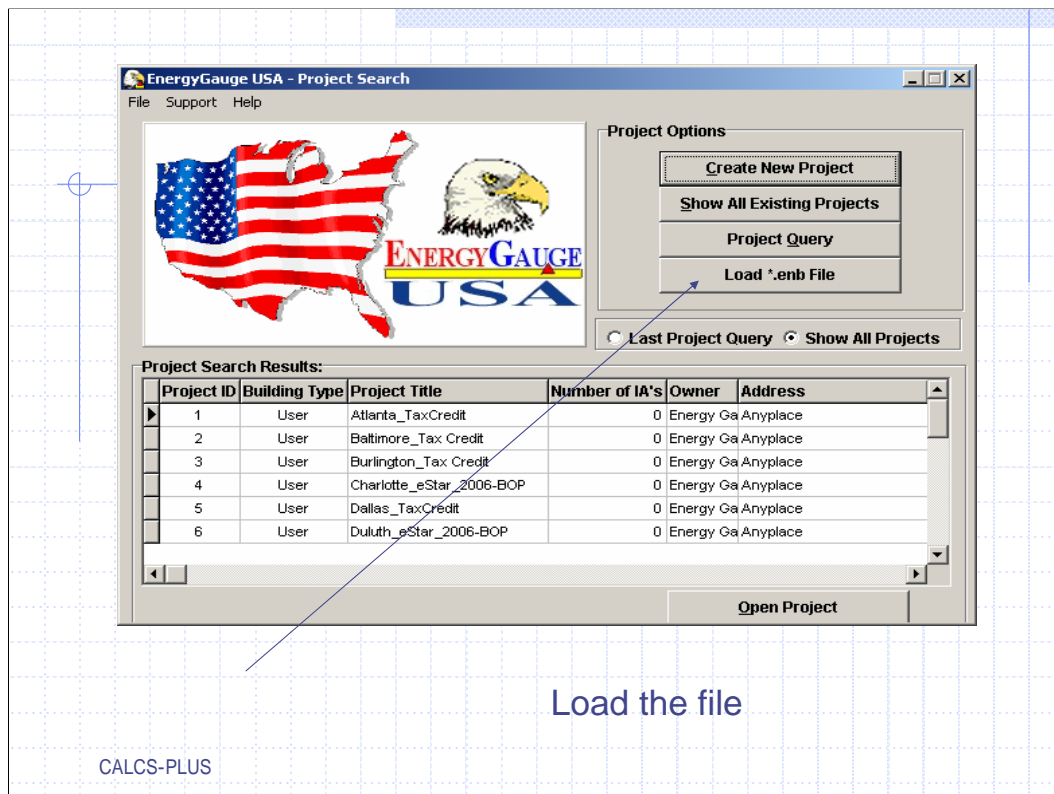
Good information from Elite Software.



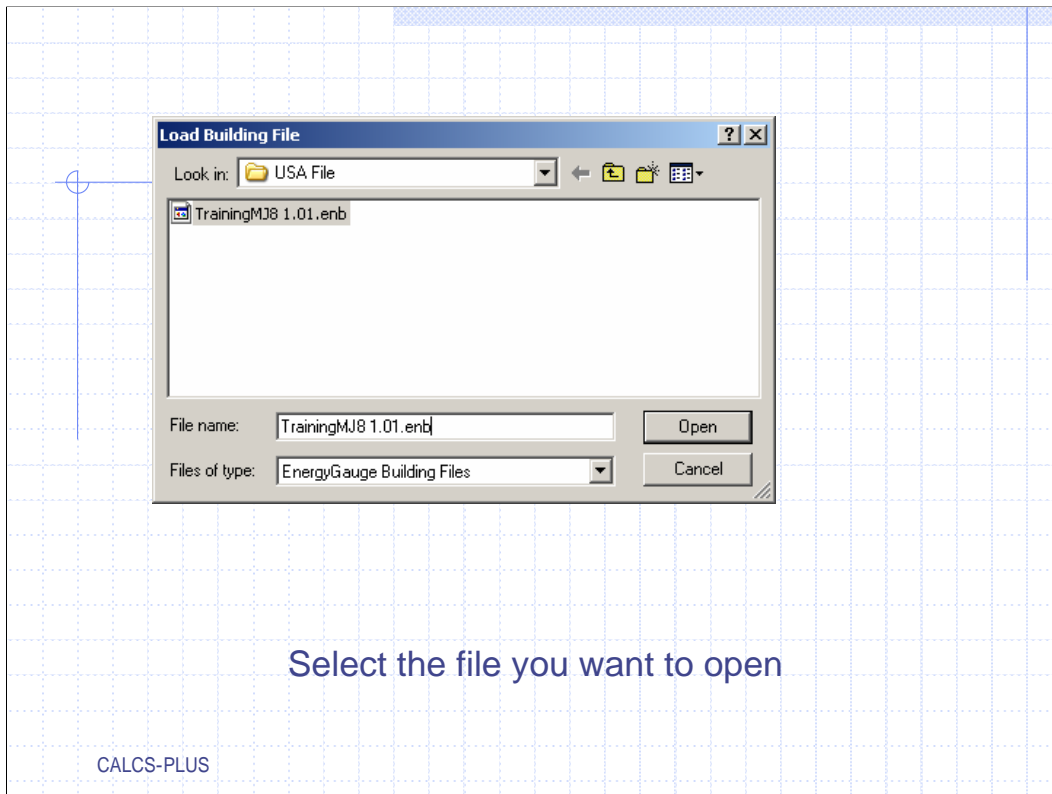
Open the rating
software

CALCS-PLUS

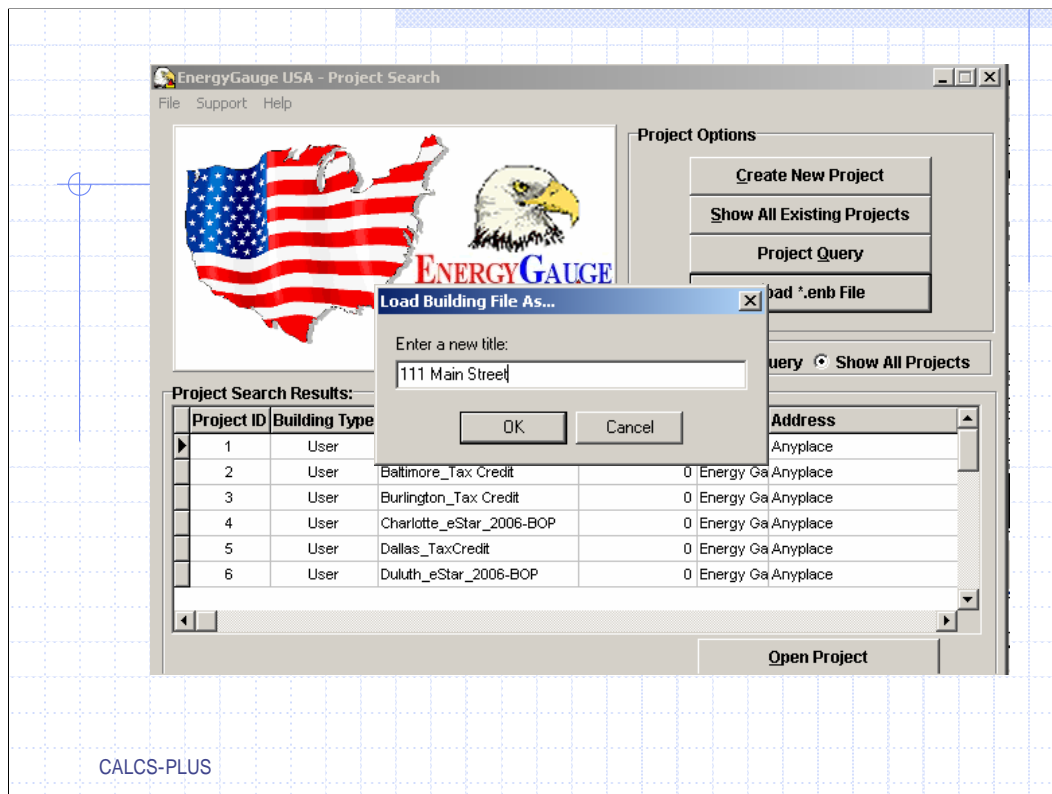
Open EnergyGauge USA.



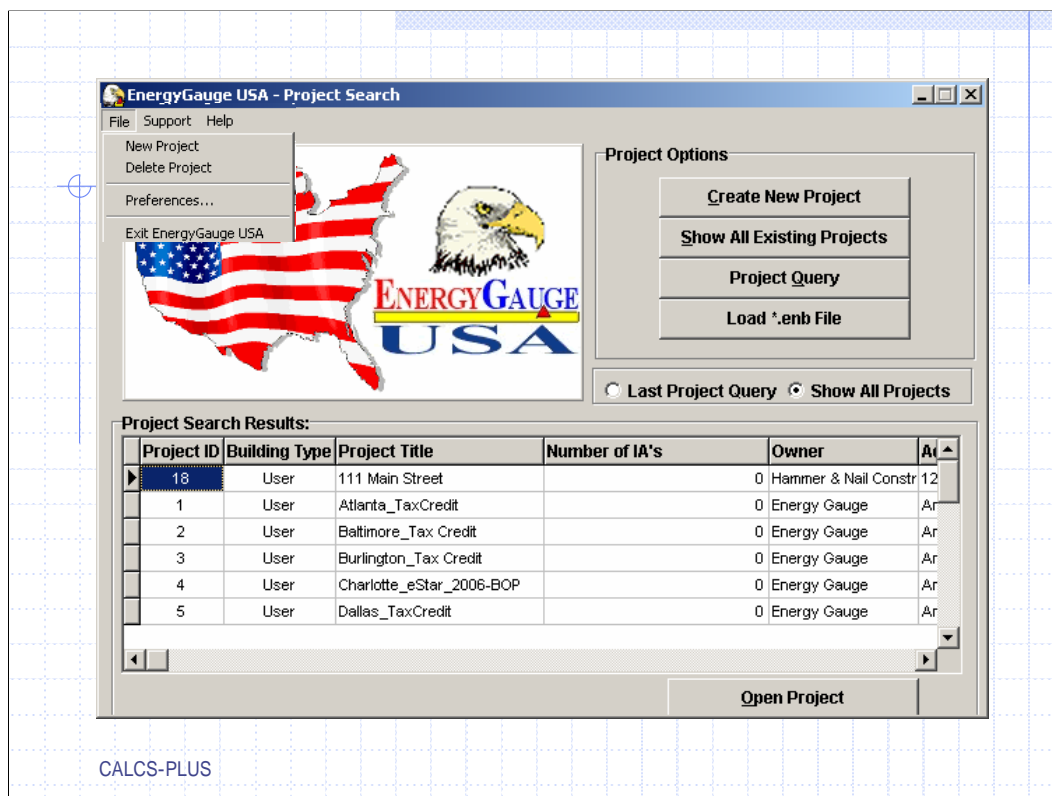
Click the “Load *.enb File”



Go to the directory you saved the exported ENB file to; select the file and click OK.



People sell houses and move into new ones so it is not a good idea to save the files under the owners name, a better way to set up your files is to keep them by address. To help us find a builder's house we preface the file name by an identifying prefix usually the initials of the company's name. When we do a rating for an individual we save the file in a folder of miscellaneous homes under the address. We will change this file's name to 111 Main Street.



Our rating software allows us to set up preferences. These are the most common construction practices in our area. Click “File” “Preferences”.

EnergyGauge USA - Preferences

Choose Default Values for New Building Components:

Rater Info | Site | Floor/Door/Window | Wall/Ceiling/Roof | Equipment | Disclosures | Views

Rater Information

Name: Joe Cool

Address: 12345 Industry Drive

City: My Town State: Florida

Zip: 33333

ID: FLA 555 Tax ID: 65-111222

HERS Provider Information

Name: Florida Solar Energy Center

Address: 1679 Clearlake Road

City: Cocoa State: Florida

Zip: 32922-5703 Phone: (321)638-1492

Email: engauge@sec.ucf.edu

OK Cancel Help

Type in your personal information, your providers information comes pre-filled in.

CALCS-PLUS

EnergyGauge USA - Preferences

Choose Default Values for New Building Components:

Rater Info | **Site** | Floor/Door/Window | Wall/Ceiling/Roof | Equipment | Disclosures | Views

Project Information

Builder:

Project Status:

Address Type:
☒ Street Address
☐ Lot Information

Occupancy:
☒ Single-Family
☐ Multi-Family

Utility

State:

Utility Name: \$/Unit: kWh

Natural Gas: Therm

Fuel Oil: Gallon

Propane: Gallon

Climate

Reference City:

☒ OK ☒ Cancel ☒ Help

CALCS-PLUS

Builder information may be project specific but utility information may be more consistent so it could be filled in as default information.

Set Defaults for Floor, Door and Window Materials

EnergyGauge USA - Preferences

Choose Default Values for New Building Components:

Rater Info | Site | **Floor/Door/Window** | Wall/Ceiling/Roof | Equipment | Disclosures | Views

Floor Defaults

Floor Type: Floor R-value:

Slab insulation type and location:

Door Defaults

Location: ☒ Exterior ☐ Adjacent Storm Door Type: ☒ None ☐ Wood ☐ Metal Door U-Value:

Window Defaults

Tint: U-Factor and Modifiers: Type: U-Factor: Overhang: Depth: ft in
 SC: Frame: Storm? ☐ Separation: ft in
 Int Shading: Screening:

OK Cancel Help

CALCS-PLUS

Select the most common building material information for your area. This will have nothing to do with what RHVAC exports into USA.

Set Defaults for Wall, Ceiling, and Floor Materials

EnergyGauge USA - Preferences

Choose Default Values for New Building Components:

Rater Info | Site | Floor/Door/Window | **Wall/Ceiling/Roof** | Equipment | Disclosures | Views

Wall Defaults

Orientation: Wall Type: Adjacent To:

Wall R-value: Wall Ins. Grade: Framing Fraction:

Solar Absorptance:

Ceiling Defaults

Ceiling Type: Framing Fraction:

Ceiling R-value: Ceiling Ins. Grade:

Trusses:
☒ Wood
☐ Metal

Roof Defaults

Roof Configuration: Roof Deck Insulation Level:

Roofing Material: Roof Deck Insulation Grade:

Attic Description: Attic Ventilation Ratio:

Roof Color: Radiant Barrier System? ☐ Yes ☒ No

Roof Pitch

Slope in Inches: / 12 Slope in Degrees:

☒ OK ☒ Cancel ☒ Help

CALCS-PLUS

Set Defaults for Equipment

EnergyGauge USA - Preferences

Choose Default Values for New Building Components:

Rater Info | Site | Floor/Door/Window | Wall/Ceiling/Roof | **Equipment** | Disclosures | Views

Cooling Defaults CoolingType: Central Unit SEER: 13 Btu/W SHR: 0.75 Air Handler Location: Garage Cooling Augmentation: <input type="checkbox"/> Ceiling Fans <input type="checkbox"/> Whole House Fan <input type="checkbox"/> Cross Ventilation	Heating Defaults Heating Type: Electric Heat Pump HSPF: 7.7 Btu/W
Duct Defaults Supply Duct Loc: Attic Return Duct Loc: Attic Duct R-value: 6	
Photovoltaic Defaults Array: Type: Shell (Siemens) SP75 Azimuth: 180 Tilt: 23 Line Loss: 0.0035 Eff Coeff: 0.0043 Albedo: 0.30 Ref Temp: 46 Inverter: Type: Trace U 2512/24/32/36/48 Battery: Type: None Number: 0	Hot Water Defaults Hot Water Type: Electric Location: Garage EF: 0.92 Capacity (gals.): 40 SetPoint (deg. F): 140 NAECA Effective Year: <input type="radio"/> 1992 <input checked="" type="radio"/> 2006

OK Cancel Help

CALCS-PLUS

Equipment may be project specific and can change more often than not. But it may be a help to set up default equipment for the most popular systems for your area.

Set Defaults for The Disclosure form

EnergyGauge USA - Preferences

Choose Default Values for New Building Components:

Rater Info | Site | Floor/Door/Window | Wall/Ceiling/Roof | Equipment | **Disclosures** | Views

- ☒ I have **NO** potential financial interest in the results of the Rating on this home.
- ☐ I am the **B**uilder or an employee of the builder of this home.
- ☐ I am the **C**ontractor or a sub-contractor, or an employee of the contractor or a sub-contractor for this home. If yes, then specify **Trades** (0 trade(s) selected)
- ☐ I am the **S**eller or his agent, or an employee of the seller or his or her agent for this home.
- ☐ I am the **M**ortgagor or an employee of the mortgagor for some portion of the financed payment this home.
- ☐ I am an employee, contractor or consultant of the electric or natural gas **U**tility serving this home.
- ☐ I am an owner, partner, officer or employee of a company that may choose to supply or install or offer a bid to supply or install **I**mprovements to this home
- ☐ I am a manufacturer or supplier, or an employee of a manufacturer or supplier of **P**roduct(s) that may be used to improve the efficiency of this home.
If yes, then specify all **Products** (0 product(s) selected)
- ☐ I have some **O**ther potential financial interest in the results of this Rating (please fully specify the nature of the financial interest) **Interests** (additional interests are not defined)

OK Cancel Help

CALCS-PLUS

EnergyGauge USA - Project Search

File Support Help

Project Options

Create New Project

Show All Existing Projects

Project Query

Load *.enb File

☐ Last Project Query ☒ Show All Projects

Project Search Results:

Project ID	Building Type	Project Title	Number of IA's	Owner	At
18	User	111 Main Street		0 Hammer & Nail Constr	12
1	User	Atlanta_TaxCredit		0 Energy Gauge	Ar
2	User	Baltimore_Tax Credit		0 Energy Gauge	Ar
3	User	Burlington_Tax Credit		0 Energy Gauge	Ar
4	User	Charlotte_eStar_2006-BOP		0 Energy Gauge	Ar
5	User	Dallas_TaxCredit		0 Energy Gauge	Ar

Open Project

Select the job to open and click "Open Project" or just simply double click on the project.

CALCS-PLUS

Open the project we just exported from RHVAC into USA by double clicking on the project or by highlighting the project and clicking the "Open Project" Button.

Edit the
page
and post
the
project

EnergyGauge USA - 111 Main Street
File View Calculate Reports Registration Support Help

Project ID: 18

User Entry Mode

of IA's: 0

Project Info

Title: 111 Main Street
 Owner: Mr & Mrs Smith
 Builder: Hammer & Nail Construction
 Comment: 111 Main Street, Anywhere, USA

Rater Name: Joe Cool
 Rater ID: FLA 555

Building Info

Status: New (From Plans)
 Rotate Building: 0
 Number of Bedrooms: 3
 Number of Bathrooms: 1
 Total Number of Stories: 1

Conditioned Area:

1235

X

Average Wall Height:

8

=

Conditioned Volume:

9880

Worst Case

☐ Yes ☒ No
 Occupancy
☒ Single Family
☐ Multi Family

Property Location

Address Type
☒ Street Address ☐ Lot Information
 Street: 1212 Easy Street
 City: Anywhere State: FL
 County: Zip: -

Post Project

Project
Climate
Utility Rates
Surroundings

Site

Envelope

Equipment

CALCS-PLUS

Information on this page will have to be verified and changed. We now know the owner is Mr. & Mrs. Smith, the builder is Hammer & Nail, so we change the items we need to and go to the climate tab. Be sure to post the project before leaving the page.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Design State: Florida
Design Location: West Palm Beach

Location Parameters

Latitude (degrees)	26.68
Longitude (degrees)	80.12
Altitude (ft)	20
Time Zone (4-10)	5
Avg. Annual Temp. (F.)	74.5

Winter Design Parameters

97.5% Design Temp. (F.)	45
Int. Design Temp. (F.)	70
Heating Degree Days	299
Weather Factor	0.69

Summer Design Parameters

2.5% Design Temp. (F.)	91
Int. Design Temp. (F.)	75
Summer Design Moist. (gr)	60
Daily Temp. Range	Medium

Oversize limit for system sizing: 1
Climate Zone: 2
Moisture Regime: Moist

Check for Better TMY Site Add/Delete User Designed Locations

Project Climate Utility Rates Surroundings

Site Envelope Equipment

CALCS-PLUS

RHVAC does not transfer climate information so this screen must be edited or you may find your project in Anchorage Alaska. Select the climate for this job. The same data base that was in the Load Calculation program is in the rating software. Return to project page and save.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

State: Florida

Fuel Cost Data

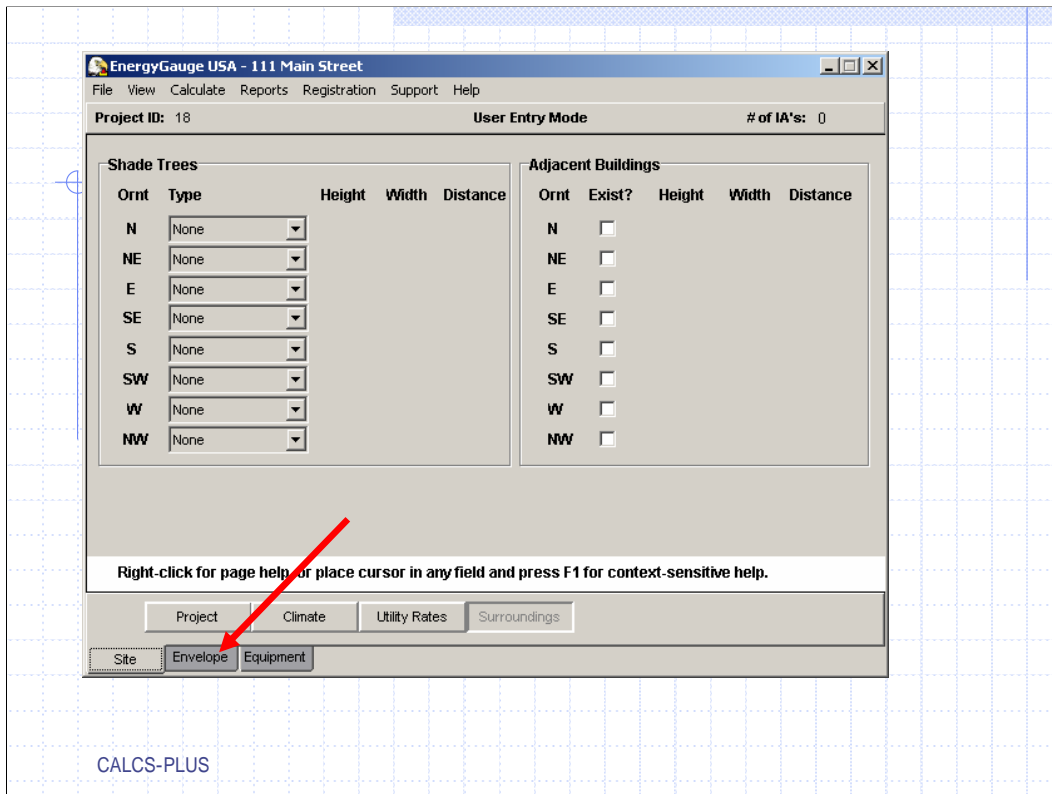
Fuel	Unit	Utility Name	Insert/Delete Utility	Cost Method	\$/Unit
Electricity	kWh	Florida Power & Light Company	Electricity	Standard	0.09
Natural Gas	Therm	Florida Average	Natural Gas	Standard	1.72
Fuel Oil	Gallon	Florida Default	Fuel Oil		1.1
Propane	Gallon	Florida Default	Propane		1.4

Project Climate Utility Rates Surroundings

Site Envelope Equipment

CALCS-PLUS

Select your local utility or default for your area.



EnergyGauge USA uses shade planes to simulate the energy use impact of shade trees and adjacent buildings surrounding the project. Note that the Surroundings screen is only available when in User Entry Mode. For today's demonstration we will not use this page.

Click the "Envelope" tab to edit the materials that were imported from from RHVAC

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Roof/Attic Structure

Roof Configuration: Gable or shed Solar Absorptance: 0.85 **Suggest**

Roofing Material: Composition shingles Roof Deck Insulation Level: 0

Attic Description: Full attic **Roof Deck Insulation Grade: Not Inspected**

Roof Color: Medium Roof Framing Fraction: 0.100

Conditioned Ceiling Footprint Area: 1285 Radiant Barrier System? ☐ Yes ☒ No

Roof Pitch

Slope in Inches: 6 / 12

Slope in Degrees: 26.6

Attic Ventilation Ratio: 0.0033 (1 to 300)

Floors(1) **Roof** Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope **Equipment**

CALCS-PLUS

If the roof has insulation on the deck then select the insulation grade, click the down arrow for “Roof Deck Insulation Grade” if this is a projected rating from plans choose “ Not Inspected”. Now is a good time to save your project.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Current Floor, Number 1 of 1

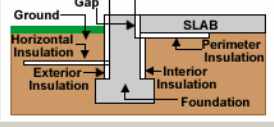
Type: Slab-On-Grade Edge Insulation R-Value: 0 Perimeter: 174

Comment: 22A-ph,1-1,2-1,3-1,5-1,6-1,7-1 U-Value: 0.304

Slab insulation type and location: Exterior insulation

Area: 1235 or Length: Width:

Tile Frac: 0 Wood/Vinyl Frac: 0 Carpet Frac: 1.00



Overview of Floors

FLOOR_ID	FLOOR_TYPE	WIDTH	LENGTH	AREA	PERIMETER	R_VALUE	C
1	Slab-On-Grade Edge Insulation			1235	174	0	

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope Equipment

CALCS-PLUS

The information we entered into the load calculation program has transferred into the floor tab, this is as we entered it. Remember on the “Site” tab we changed the square foot of living space as recorded on the plans by the builder. On this screen the total floor area should be the same as the “Conditioned Ceiling Footprint Area ” under the “Roof” tab.

Remember the helpful hint from RHVAC regarding how they export, here is our first example, each floor is listed by type, room location, and number.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Roof/Attic Structure

Roof Configuration: Gable or shed Solar Absorptance: 0.85 **Suggest**

Roofing Material: Composition shingles Roof Deck Insulation Level: 0

Attic Description: Full attic Roof Deck Insulation Grade: I

Roof Color: Medium Roof Framing Fraction: 0.100

Conditioned Ceiling Footprint Area: **1235** Radiant Barrier System? ☐ Yes ☒ No

Roof Pitch

Slope in Inches: 6 / 12

Slope in Degrees: 26.6

Attic Ventilation Ratio: 0.0033 (1 to 300)

Floors(1) **Roof** Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope **Equipment**

CALCS-PLUS

Note: If it is a single story home the floor area under ceiling is the same as the SQ FT of the home. The conditioned ceiling area may be larger, especially if we are dealing with tray or cathedral ceilings. Change the roof configuration, materials, etc to match your building.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Roof/Attic Structure

Roof Configuration: Gable or shed Solar Absorptance: 0.85 **Suggest**

Roofing Material: Composition shingles Roof Deck Insulation Level: 0

Attic Description: Full attic Roof Deck Insulation Grade: Not Inspected

Roof Color: Medium Roof Framing Fraction: 0.100

Conditioned Ceiling Footprint Area: 1235 Radiant Barrier System? ☐ Yes ☒ No

Roof Pitch

Slope in Inches: 4 / 12

Slope in Degrees: 18.4

Attic Ventilation Ratio: 0.0033 (1 to 300)

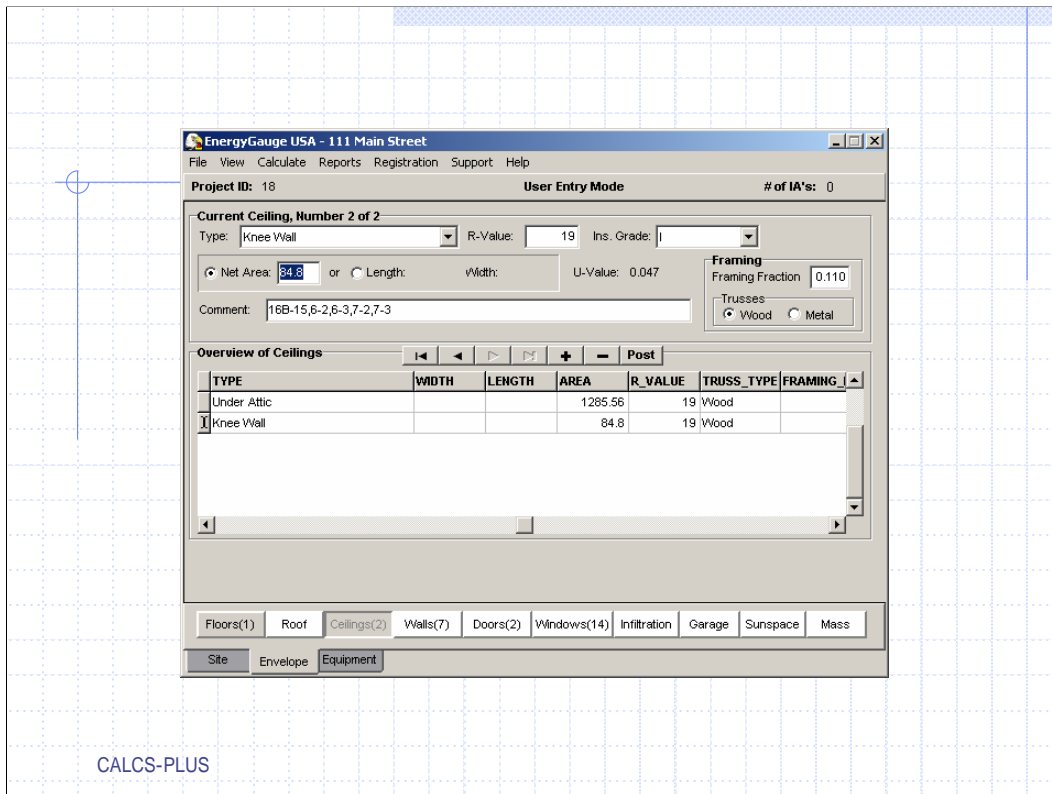
Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope Equipment

CALCS-PLUS

The “Roof Pitch” defaults to 6/12, change the roof pitch to match the home you are working on.

If there is insulation on the roof deck and you have entered a value in the “Roof Deck Insulation Level” then change the ‘Roof Deck Insulation Grade to “Not Inspected”



Our first ceiling “Type” is the ceiling with 19 insulation on top of it. The the second ceiling type is the “Knee Wall”s. EnergyGauge USA wants to keep knee walls separate from ceilings “Under Attic”. RHVAC doesn’t care if the ceilings are horizontal or vertical, if they face the vented attic they are ceilings. In order to separate the knee walls from the rest of the ceilings in RHVAC we gave them a slightly different R-value (15). This way when the ceilings are imported into USA we can identify them and edit the ceiling with the different R-value and identify it as a “Knee Wall”. We can also edit the R-value to the correct insulation if need be.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Current Ceiling, Number 2 of 2

Type: Knee Wall R-Value: 19 Ins. Grade: Not Inspected

Net Area: 84.8 or Length: Width: U-Value: 0.047

Comment: 16B-15,6-2,6-3,7-2,7-3

Framing Fraction: 0.110

Trusses: Wood Metal

Overview of Ceilings

CEIL_ID	TYPE	WIDTH	LENGTH	AREA	R_VALUE	TRUSS_TYPE
1	Under Attic			1265.56	19	Wood
2	Knee Wall			84.8	19	Wood

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope Equipment

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Be sure to indicate the proper grade of insulation, in this case it is not inspected because again this is being done from plans.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Current Wall, Number 1 of 7

Orient: S Type: Concrete Block - Int Insul Adjacent To: Exterior

Wall Area Width: 58.8 ft in Height: 9 ft in Calculated Area: 529.21²

Wall Cavity Ins. R-Value: Ins. Grade: Framing Fraction: 0

Exterior Characteristics Sheathing R-Value: 5 U-Value: 0.132 Solar Absorptance: 0.80

Comment: 13A-5ocs,1-1,5-1,6-1,8-1

Overview of Walls

WALL_ID	ORIENTATION	WALL_TYPE	ADJACENT_TO	A
1	S	Concrete Block - Int Insul	Exterior	
2	E	Concrete Block - Int Insul	Exterior	
3	N	Concrete Block - Int Insul	Exterior	
4	W	Frame - Wood	Garage	

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope Equipment

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Our wall information comes in correct for direction and SQ FT. This wall transfers over as a “Concrete Block –Internal Insulation”, note that under “Wall Cavity” the “Ins. R-Value” is 0 and under “Exterior Characteristics” the “Sheathing R-Value” is 5, this will need to be reversed to match the construction type of the project we are working on.

Be sure to look this over carefully and change to match the construction type of the project you are working on. We will change our insulation under “Exterior Characteristics” to 0 and move our R-5 value to “Wall Cavity”. This procedure must be repeated for each wall.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Current Wall, Number 1 of 7

Orient: S Type: Concrete Block - Int Insul Adjacent To: Exterior

Wall Area Width: 58.8 ft in Height: 9 ft in Calculated Area: 529.21*

Wall Cavity Ins. R-Value: 5 Ins. Grade: I Framing Fraction: 0

Exterior Characteristics Sheathing R-Value: 0 U-Value: 0.132 Solar Absorptance: 0.80

Comment: 13A-5ocs,1-1,5-1,6-1,8-1

Overview of Walls

WALL_ID	ORIENTATION	WALL_TYPE	ADJACENT_TO
1	S	Concrete Block - Int Insul	Exterior
2	E	Concrete Block - Int Insul	Exterior
3	N	Concrete Block - Int Insul	Exterior
4	W	Frame - Wood	Garage

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope Equipment

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USA looks at “Concrete Block – Int Insul” or “Concrete Block – Ext Insul” walls as having continuous insulation with no framing factor.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Current Wall, Number 4 of 7

Orient: W Type: Frame - Wood Adjacent To: Garage

Wall Area Width: 6.4 ft in Height: 10.5 ft in Calculated Area: 67.2 ft²

Wall Cavity Ins. R-Value: 11 Ins. Grade: I Framing Fraction:

Exterior Characteristics Sheathing R-Value: 0 Solar Absorptance: 0.80 U-Value: 0.075

Comment: 12B-0sw,6-2

Overview of Walls

WALL_ID	ORIENTATION	WALL_TYPE	ADJACENT_TO	A
1	S	Concrete Block - Int Insul	Exterior	
2	E	Concrete Block - Int Insul	Exterior	
3	N	Concrete Block - Int Insul	Exterior	
4	W	Frame - Wood	Garage	

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope Equipment

CALCS-PLUS

For our frame walls we need to input a framing factor. F1 will bring up the help screen with information to use for this.

Orient: Type: Adjacent To:

Wall Area		Wall Cavity		Exterior Characteristics	
Width:	6.4 ft <input type="text" value=""/>	Ins. R-Value:	<input type="text" value="11"/>	Sheathing R-Value:	<input type="text" value="0"/>
Height:	10.5 ft <input type="text" value=""/>	Ins. Grade:	<input type="text" value="I"/>	Solar Absorptance:	<input type="text" value="0.80"/>
Calculated Area: 67.2 ft ²		Framing Fraction:	<input type="text" value=""/>	U-Value: 0.075	

Comment:

Spacing Framing Fraction

Standard Framing:

16" o.c.	.23
24" o.c.	.20

Advanced Framing:

16" o.c.	.19
24" o.c.	.16

CALCS-PLUS

Recommended default factors

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Current Wall, Number 4 of 7

Orient: W Type: Frame - Wood Adjacent To: Garage

Wall Area: Width: 6.4 ft Height: 10.5 ft
 Calculated Area: 67.2 ft²

Wall Cavity: Ins. R-Value: 11 Ins. Grade: [v]
 Framing Fraction: 0.230

Exterior Characteristics: Sheathing R-Value: 0 Solar Absorptance: 0.80
 U-Value: 0.092

Comment: 12B-0sw,6-2

Overview of Walls

WALL_ID	ORIENTATION	WALL_TYPE	ADJACENT_TO	A
1	S	Concrete Block - Int Insul	Exterior	
2	E	Concrete Block - Int Insul	Exterior	
3	N	Concrete Block - Int Insul	Exterior	
4	W	Frame - Wood	Garage	

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope Equipment

CALCS-PLUS

Our building is 16" on center so we will use .23. Again, the framing factor will have to be edited for each frame wall.

Remember,
each wall
must be
individually
edited.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Current Wall, Number 1 of 7

Orient: S Type: Concrete Block - Int Insul Adjacent To: Exterior

Wall Area: Width: 58.8 ft Height: 9 ft Calculated Area: 529.21

Wall Cavity: Ins. R-Value: 5 Ins. Grade: Not Inspected Framing Fraction: 0

Exterior Characteristics: Sheathing R-Value: 0 Solar Absorptance: 0.80 U-Value: 0.132

Comment: 13A-Socs,1-1,5-1,6-1,8-1

Overview of Walls

WALL_ID	ORIENTATION	WALL_TYPE	ADJACENT_TO
1	S	Concrete Block - Int Insul	Exterior
2	E	Concrete Block - Int Insul	Exterior
3	N	Concrete Block - Int Insul	Exterior
4	W	Frame - Wood	Garage

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope Equipment

CALCS-PLUS

One more quick entry and our wall page will be done. Insulation grade must be rated. In our case it will not be inspected. Click on each wall and enter the appropriate grade.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Current Door, Number 2 of 2

Wall ID: 7 N Frame - Wood Winter U-value: 0.390 Calc. U-Value

Door Area Data

Width: 3 ft in Height: 6.7 ft in Calculated Area: 20.11²

Door Type: ☒ Wood ☐ Insulated Storm Door Type: ☒ None ☐ Wood ☐ Metal

Comment: 11D,8-2

Overview of Doors

DOOR_ID	WALL_ID	TYPE	AREA	WINTER_U_VALUE	STORM_DOOR_TYPE
1	1	Insulated	20.1	0.600	None
2	7	Wood	20.1	0.390	None

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope Equipment

CALCS-PLUS

Door information transfers into the rating program correct so nothing needs changing on this page.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Current Window, Number 1 of 11

Wall ID/Skylight: 1 S Concrete Block - Int Ins Location: # of windows like this one: 1

U-Factor Modifiers

Type: Single

Frame: TIM

☐ Storm Window ? ☒ Auto Calculate

U-Factor 1.080

Tint: SHGC[window] 0.75

Window Area Data

Width: 4.4 ft in

Height: 3.2 ft in

Calculated Area: 14.08 ft²

Overhang Data

Depth: 2 ft in

Separation: 1 ft in

Int Shade: Drapes/blinds Screening: Exterior 50% Comment: 1A-cb-o,1-1

Overview of Windows

WIN_ID	WALL_ID	GLASS_TYPE	FRAME_TYPE	STORM	U_VALUE	TOTAL_AREA	NUM_UNITS	I_SEP
1	1	Single	TIM	N	1.080	14.08	1	
2	1	Single	TIM	N	1.080	14.08	1	
3	3	Single	TIM	N	1.080	14.08	1	
4	3	Single	TIM	N	1.080	14.08	1	
5	3	Single	TIM	N	1.080	14.08	1	

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

Site Envelope Equipment

CALCS-PLUS

Windows transfer from the load calculation program as they were entered; the window height and width; the overhang depth and separation; interior shading, and screening all come into USA with no editing necessary. As on the wall page, the "Comment" box tells the type of window, room & wall the window is on in RHVAC.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Data Entry Method

- ☒ Best Guess
- ☐ Proposed SLA
- ☐ Proposed CFM(50)
- ☐ Proposed ELA
- ☐ Proposed EqLA
- ☐ Proposed ACH
- ☐ Proposed ACH(50)

Infiltration

Estimated Envelope Tightness

- ☐ Good
- ☒ Average
- ☐ Poor

Calculate/Post

Infiltration Characteristics

CFM(50):	1620
ELA:	88.9
EqLA:	167.2
ACH:	0.345
ACH(50):	9.84
SLA:	0.00050

Wind Shielding

Terrain Parameter: Suburban

Shielding Coefficient: Suburban

Ventilation Air

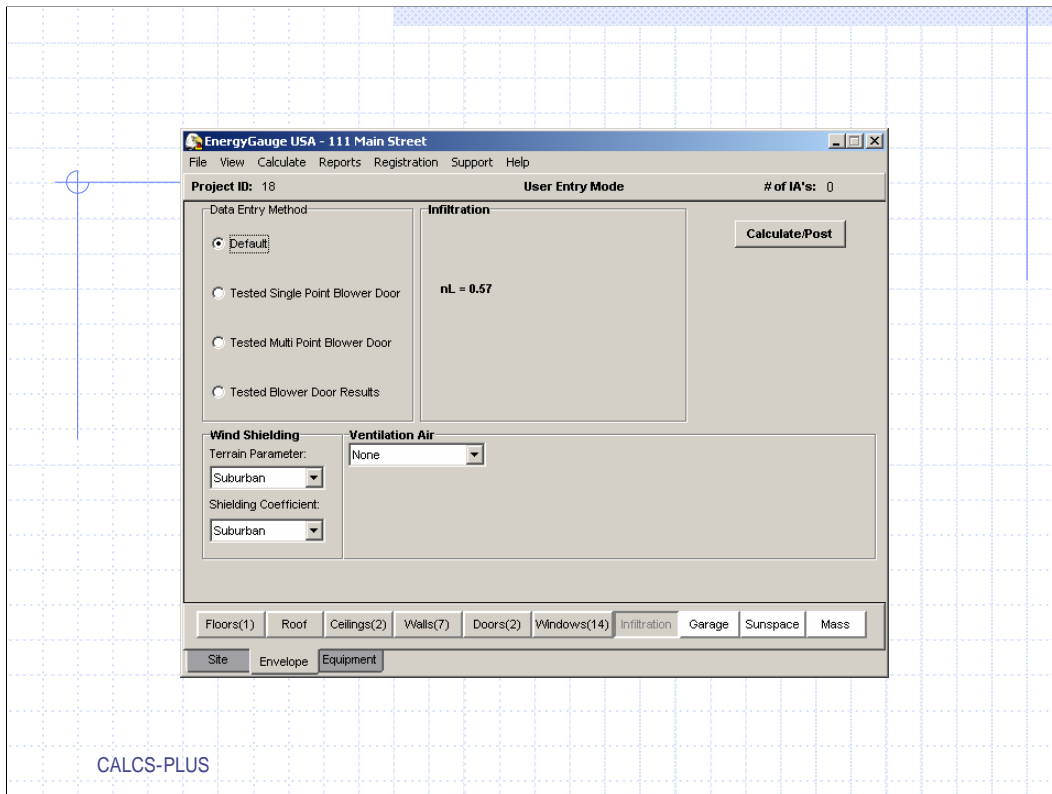
None

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

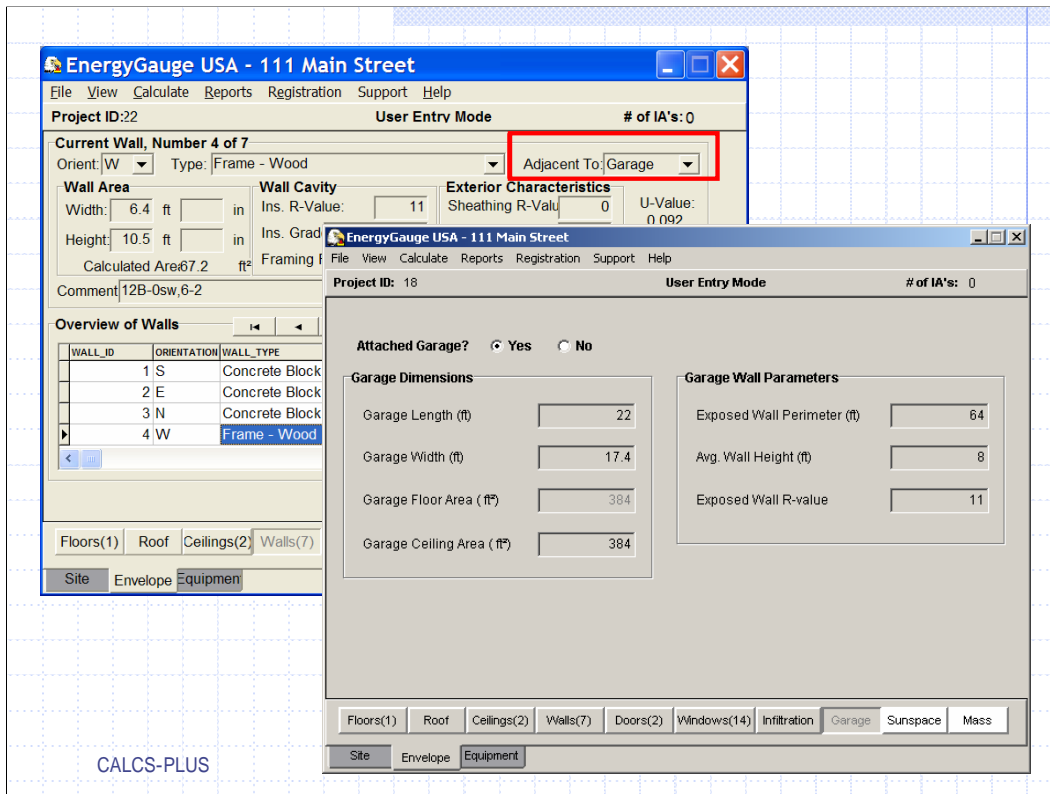
Site Envelope Equipment

CALCS-PLUS

Infiltration. On the site page of USA under building information: Status: we selected new (from plans), because of this our options on the infiltration page are these.



Had we selected new (inspected and tested), our data entry options are changed and here is where we can add our test results.



RHVAC automatically builds a default garage in USA, this is needed because back in the wall section we had some walls that were “Adjacent To” a garage. If all the walls are “Adjacent To” Exterior you can click on “No”. But in this example we have an attached garage and since RHVAC exported a default garage we can edit to the proper dimensions.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

☒ **Sunspace?** Flr Area: 168

Floor

Area: R-value:

Slab: 168 0

Crawl-space: 0 19

Roof

R-value: 30 Area: 143

Solar absorp.: 0.9 Tilt: 22.8

Glazed area: 50 S.C.: 0.75

Glazing U-val: 0.5 Night-Insulation? ☐

Exterior Walls/Windows

Avg. Hght: 8 Wall R-value: 19 Door R-val: 5

Masonry? ☐ Solar absorp.: 0.6 Night ins. R-val: 4

Direction	Gross Area	Door Area	Glazed Area	S.C.	U-Val	Night Ins?
Wall 1: W	68	21	20	0.75	0.5	<input type="checkbox"/>
Wall 2: E	68	21	20	0.75	0.5	<input type="checkbox"/>
Wall 3: S	184	21	100	0.75	0.5	<input type="checkbox"/>

Common Wall

R-value	Gross Area	Door Area	Glazed Area	S.C.	U-Val	Night Ins?
11	184	21	42	1	1.11	<input type="checkbox"/>

Space Conditions (Summer)

Vented ☒ Blinds ☒

Overhangs

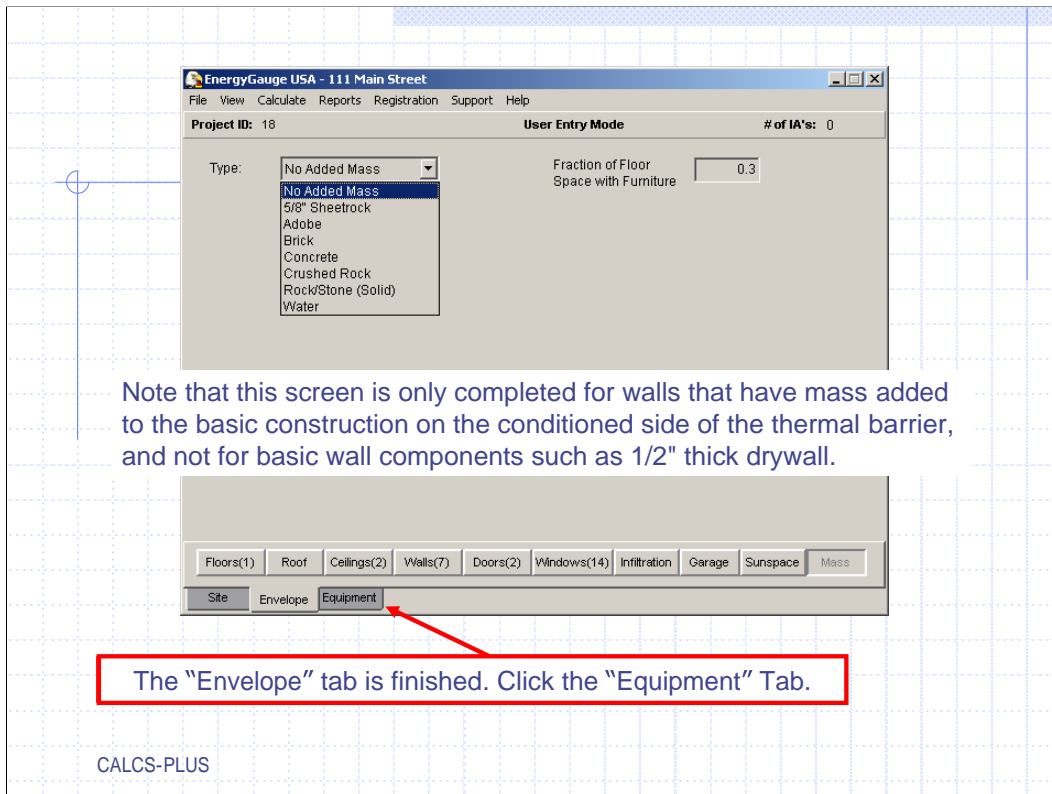
Depth: 1.5 Separation: 6

Floors(1) Roof Ceilings(2) Walls(7) Doors(2) Windows(14) Infiltration Garage Sunspace Mass

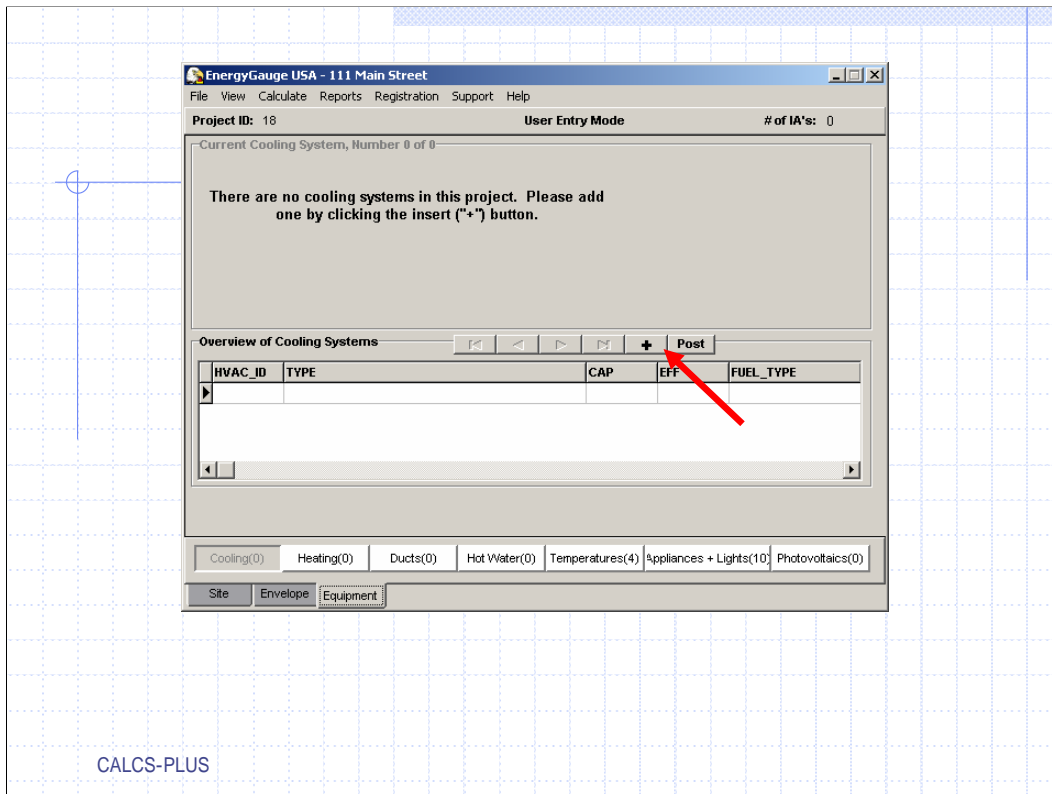
Site Envelope Equipment

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If your building has a sunspace click the box and a new entry box appears, fill in the appropriate data



Note that this screen is only completed for walls that have mass added to the basic construction on the conditioned side of the thermal barrier, and not for basic wall components such as 1/2" thick drywall.



Under the “Equipment” tab we will first fill in the “Cooling” equipment information.

Click the “+” to add the cooling equipment.

Central Unit

PTAC and Room Unit

Geothermal Heat Pump

Natural Gas Heat Pump

LP Gas Heat Pump

Evaporative Cooler

EnergyGauge USA - 111 Main Street
File View Calculate Reports Registration Support Help

Project ID: 18
User Entry Mode
of IA's: 0

Current Cooling System, Number 1 of 1

Type: Central Unit ☐ System is Unducted

Cooling Attributes

☐ Whole House Fan

☐ Cross Ventilation

System Sizing

☐ Size on Calculation Size Now

System Information

Sensible Heat Ratio: 0.75

Efficiency: 13 Btu/Wh

Capacity: 30 kBtu/hr

Tested Coil Air Flow: 1000 CFM Suggest

Comment:

Manufacturer: USA Air Model Number: USA 00030 xyz

Overview of Cooling Systems

HVAC_ID	TYPE	CAP	EFF	FUEL_TYPE
1	Central Unit	30	13	Electric

Cooling(1)
Heating(0)
Ducts(0)
Hot Water(0)
Temperatures(4)
Appliances + Lights(10)
Photovoltaics(0)

Site
Envelope
Equipment

CALCS-PLUS

Fill in the cooling system “Type”, if the system is unducted check the box to indicate so, and go to the “System Information” and fill in the “Sensible Heat Ratio”, “Efficiency”, “Capacity”, and “Tested Coil Airflow”.

USA doesn’t really have provisions for multiple systems. So if you are working on a project with multiple units you must total up all of the systems and enter them as one unit.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Current Duct, Number 1 of 1

Duct R-Value: 6
 Supply Duct Area: 247
 Return Duct Area: 61.75
 Number of Returns: 1
 Supply Duct Location: Attic
 Return Duct Location: Attic
 Air Handler Location: Garage

Leakage Type

☒ Default Leakage
☐ Proposed Gn
☐ Proposed Leak Free
☐ Proposed Air Leakage
☐ Proposed Dist. Eff.

Comment:

Calculate

Overview of Duct Systems

HVAC_ID	RETURN_DUCT_LOC	SUPPLY_DUCT_LOC	RETURN_DUCT_R_VALUE	SUI
1	Attic	Attic	6	

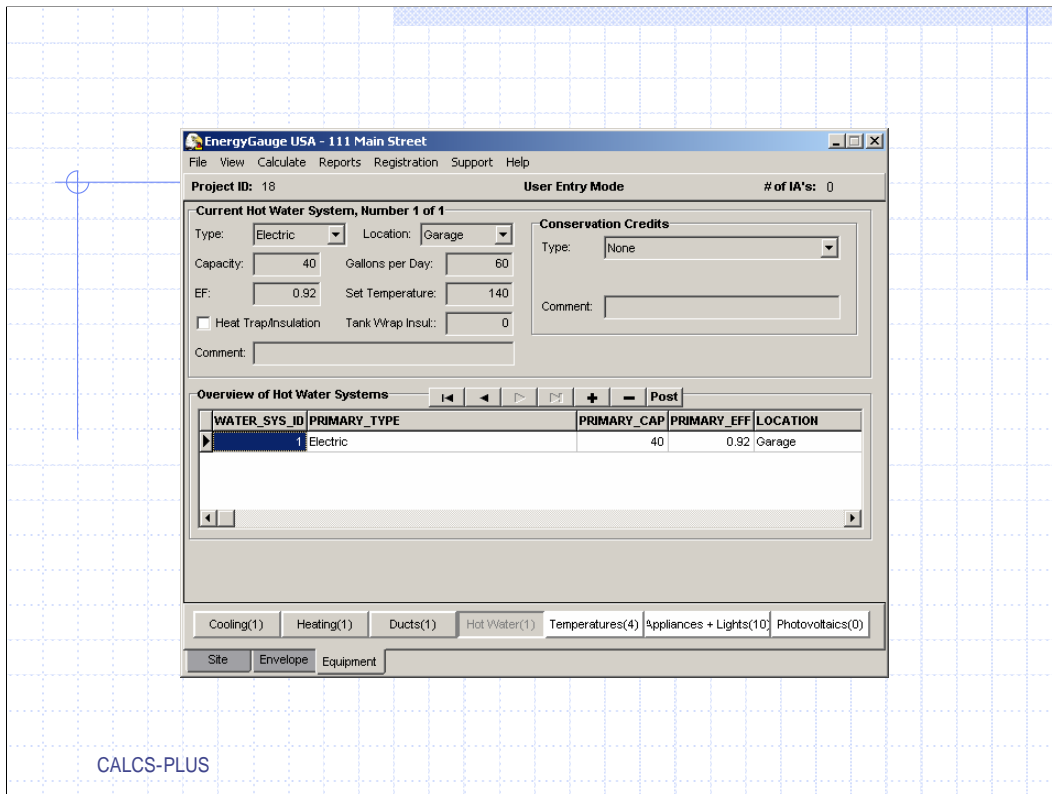
Navigation: [Previous] [Next] [Post]

Buttons: Cooling(1) Heating(1) Ducts(1) Hot Water(0) Temperatures(4) Appliances + Lights(10) Photovoltaics(0)

Site Envelope Equipment

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When you select to add a duct system default data appears, change any of the factors that is not correct for your building



Select the “+” to add hot water components, the default information we entered in our preferences came in as our hot water component. This can be changed to match your building.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 22 User Entry Mode # of IA's: 0

Thermostat Schedules

Name: HERS 2006 Reference

Comment: Cooling Weekday Schedule

Programmable Thermostat ☐

Schedule

Schedule Type: Cooling (WD) 68

	1	2	3	4	5	6	7	8	9	10	11	12
AM	78	78	78	78	78	78	78	78	78	78	78	78
	13	14	15	16	17	18	19	20	21	22	23	24
PM	78	78	78	78	78	78	78	78	78	78	78	78

Schedules

	TYPE	HOURL_1	HOURL_2	HOURL_3
>	Cooling (WD)	78	78	78

Seasonal Schedule

	Heat	Cool	Vent
Jan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feb	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mar	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Apr	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
May	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Jun	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Jul	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Aug	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sep	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oct	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Nov	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Dec	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Cooling(1) Heating(1) Ducts(1) Hot Water(1) Temperatures(4) Appliances + Lights(1) Photovoltaics(0)

Site Envelope Equipment

CALCS-PLUS

Check the Heat, Cool, or Vent box for each month of the year that space heating, space cooling or natural ventilation will be used. Note that more than one box may be checked for each month, and to obtain ventilation credit, both the Cool and Vent boxes must be checked for each month that applies. Defaults will be scheduled based on your chosen climate location.

EnergyGauge USA - 111 Main Street

File View Calculate Reports Registration Support Help

Project ID: 18 User Entry Mode # of IA's: 0

Appliances Present

Washers	Dryers	Ranges	Refrigerators	% Fluores.	Ceiling Fans	Dishwashers	Pool Pumps	Well Pumps
0	1	1	1	10.0	0	0	0	0

Appliance Schedules

Name: HERS 2006 Reference Change Calc Misc

Schedule Details

Appliance Type: Clothes Washer % heat released: 60

1	2	3	4	5	6	7	8	9	10	11	12
AM 1047	0814	0465	0465	0814	1279	2558	5698	8488	1	9767	8721
13	14	15	16	17	18	19	20	21	22	23	24
PM 7791	6977	6047	5698	5814	5698	5698	5698	5698	4884	4302	1977

Annual Use Value: 0.0 kWh/Yr
0 Watts
Calc Peak Demand

Schedule

TYPE	HOURL_1	HOURL_2	HOURL_3	HOURL_4	HOURL_5
Ceiling Fans (Summer)	0.65	0.65	0.65	0.65	0
Clothes Washer	0.1047	0.0814	0.0465	0.0465	0.01

Cooling(1) Heating(1) Ducts(1) Hot Water(1) Temperatures(4) Appliances + Lights(10) Photovoltaics(0)

Site Envelope Equipment

CALCS-PLUS

Add appliances

EnergyGauge USA - 111 Main Street

FileViewCalculateReportsRegistrationSupportHelp

Project ID: 18User Entry Mode# of IA's: 0

Current Heating System, Number 1 of 1

Type:Electric Heat Pump☐ System is Unducted

HSPF:7.7 Btu/WhCapacity:30 kBtu/hr

Comment:

Manufacturer:USA AirModel Number:USA HP 030 05

System Sizing☐ Size on Calculation

Size Now

Overview of Heating Systems

«

◀

▶

»

—

Post

HVAC_ID	TYPE	EFF	CAP	DESCP
▶ 1	Electric Heat Pump	7.7	30	

◀

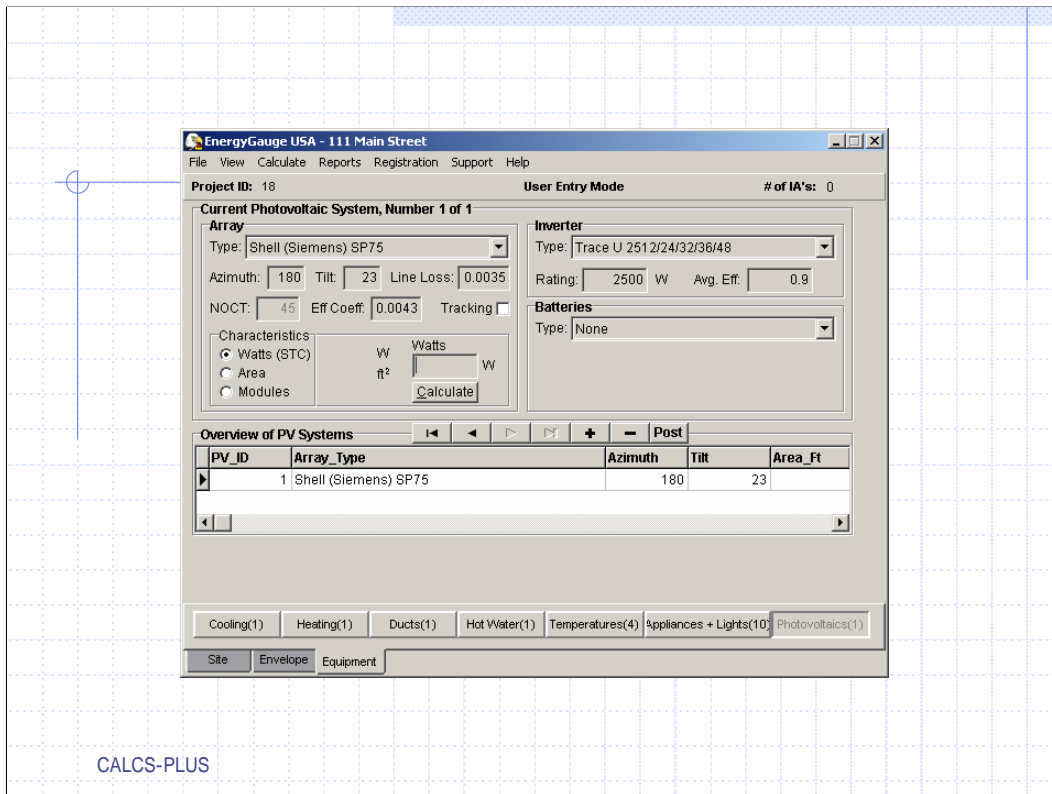
▶

Cooling(1)Heating(1)Ducts(0)Hot Water(0)Temperatures(4)Appliances + Lights(10)Photovoltaics(0)

SiteEnvelopeEquipment

CALCS-PLUS

Enter your heating equipment and type.



Photovoltaic Systems can be added here. Verify the information for the system at your building

Calculate a projected HERS Index

EnergyGauge USA - 111 Main Street

File View **Calculate** Reports Registration Support Help

Project ID: Annual Simulation Entry Mode # of IA's: 0

Thermal Name: Code Compliance
Rating... HERS 1999
Fannie Mae HERS 2006
System Sizing
Tax Credit

Schedule Type: Heating (WEH) Set All To Use 68

	1	2	3	4	5	6	7	8	9	10	11	12
AM	68	68	68	68	68	68	68	68	68	68	68	68
PM	68	68	68	68	68	68	68	68	68	68	68	68

Schedules

TYPE	HOUR_1	HOUR_2	HOUR_3
Heating (WEH)	68	68	68

Seasonal Schedule

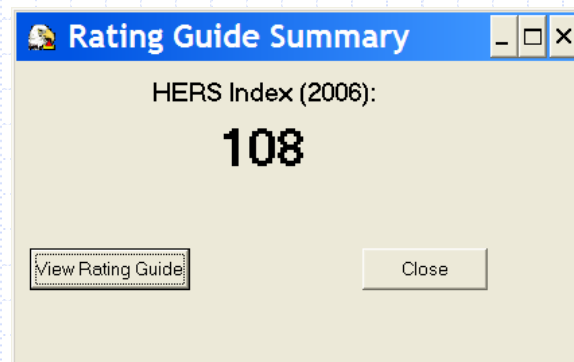
	Heat	Cool	Vent
Jan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feb	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mar	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Apr	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
May	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Jun	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Jul	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Aug	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sep	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oct	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Nov	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Dec	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Cooling(1) Heating(1) Ducts(1) Hot Water(1) Temperatures(4) Appliances + Lights(1) Photovoltaics(0)

Site Envelope Equipment

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Looks like we need to work with the Owner/Builder to achieve an acceptable HERS Index.



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Thank You

Questions?

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