EnergyPro Features

- Calculates HVAC Operating Costs & Building Energy Usage
- **Complies with LEED, ASHRAE 90.1 and Title 24**
- Performs 8,760 Hour by Hour Annual Energy Calculations
- Provides Complete Life Cycle Cost Economic Analysis
- Models All Types of Heating and Cooling Systems Including **VRF** (Variable Refrigerant Flow) Systems
- Allows for All Types of Non-HVAC Process Energy Uses
- Handles Complex Building Designs and Schedules
- Over 1800 Hourly Weather Data Files Provided
- Allows Complex Utility Cost Rate Structures
- Daylighting Analysis Capability
- Accounts for Solar Space Heating & Domestic Water Heating
- Provides Scores of Report Types in PDF Form
- **Links with Elite's CHVAC & RHVAC Load Programs**
- *No Copy Protection Hassles! - No Annual Fees!*

EnergyPro Overview

EnergyPro is a comprehensive residential and non-residential commercial building energy analysis software package. The software allows for entry of any type of building and for virtually all types of cooling and heating equipment, including variable refrigerant flow (VRF) technology. Along with HVAC operating costs, EnergyPro also calculates miscellaneous building energy uses such as outdoor lighting, domestic hot water, pump power, and more. Daylighting and solar space heating and hot water heating can also be accounted for. There are 14 EnergyPro modules that can be combined in any way desired to meet your building modeling and reporting needs.

The state of California has long been a leader in requiring energy efficient buildings. The California building efficiency requirements were codified into many documents under Title 24. EnergyPro was born from the need for designers to have a simple way of using personal computers to comply with all the special building modeling and reporting required under Title 24. Over the years, the capabilities of EnergyPro have expanded far beyond just meeting Title 24 requirements. Of the 14 modules available for EnergyPro, seven of these are generic in nature and useful to designers all around the world. Even some of the California specific modules such as for prescriptive building envelope, indoor and outdoor lighting analysis are useful to non-California designers.

The NRM7 module combined with the IM1 interface module for a total price of $1200 is the perfect combination for designers who want to model buildings and comply with both ASHRAE 90.1 and LEED. For residential designers, a popular combination is the IM1 interface module and the RM4 performance module for a total of only $500. There are no mandatory annual fees required with this software.

DEMONSTRATION VERSION

If you would like to evaluate EnergyPro's 14 modules in further detail, you can read more info and ***download free of charge*** a demo of EnergyPro from Elite's web site, **www.elitesoft.com**

Calculation Method

EnergyPro has evolved for over 25 years and uses numerous sophisticated calculation techniques for modeling buildings of all types. Commercial buildings and non-residential buildings of all types are primarily calculated based on the procedures from the U.S. Department of Energy software known as DOE 2.1e. Residential buildings are modeled based on procedures developed by the California Energy Commission for use in their pioneering building energy conservation efforts known as Title 24 and explained in the Residential Alternative Calculation Method (ACM) Approval Manual.

Program Input

EnergyPro organizes the building data under an explorer tree diagram in a single window. The building tree can be expanded up and down to expose more or less data as desired. Multiple projects can be open at the same time if need be. All buildings, residential or commercial, simple or complex, are entered through this same data entry system. Whether certain inputs are used or not depend upon what EnergyPro modules have been purchased. Basic building data like roofs, walls, and windows are pertinent to all EnergyPro modules. Other data, such as home loan rates and terms, may only be relevant to one specific module. **Both Elite Software's RHVAC and CHVAC load calculation programs can produce project files for use with EnergyPro.** This feature eliminates the redundant entry of building data between the load calc software and energy analysis software. Note that additional data (utility rates, schedules, etc.) must still be added once in EnergyPro, but none of the building material and dimension data have to be reentered. This linking of Elite load calc programs with EnergyPro also means that EnergyPro gains the benefit of having data able to come graphically from Elite's Drawing Board program or from other CAD systems that use the gbXML file format such as AutoCAD MEP and Revit. Whether using just one or multiple modules of EnergyPro, the EnergyPro IM1 interface module is required.

System Requirements

EnergyPro is a Windows program and will run on any computer with Windows XP or higher including Windows 7 and 8.

LEED COMPLIANCE DETAILS (Part 4 of 5) — EAP-S

Project Name: *Educational Version for Class Assignments Only*
Date: 1/20/12

1.4.4 – ASHRAE 90.1 Section 7: Service Water Heating

Model Input Parameter / Energy Efficiency Measure	Baseline Case	Proposed Case
SHW Equipment Type	Gas Fired	Gas Fired
SHW Storage Tank Capacity	50.0 gallons	50.0 gallons
SHW Heating Input Capacity	40,000 Btu/hr	40,000 Btu/hr
Equipment Efficiency	0.575 Energy Factor	0.575 Energy Factor
Temperature Controls		
SHW Energy Recovery	None	None
Other		

1.4.5 - ASHRAE 90.1 Section 9: Lighting

Model Input Parameter / Energy Efficiency Measure	Baseline Case	Proposed Case
Automatic Lighting Shutoff Method		
Gross Lighted Floor Area	5,280 ft²	5,280 ft²
Interior Lighting Power Calculation Method	Space by Space	Space by Space
Interior Lighting Power Density (Average)	1.152 w/ft²	0.910 w/ft²
Interior LPD per space (Space-by-Space)	See EAp2 Page 1	See EAp2 Page 1
Additional Lighting Power Allowance	Process LPD: 0.364 w/ft²	Process LPD: 0.364 w/ft²
Automatic Interior Space Shutoff Control in Required Spaces (Section 9.4.1.2)		
Interior Lighting Power Adjustments (Table G3.2)	0.000 w/ft²	0.072 w/ft²
Daylighting Dimming Controls		
Automatic Exterior Lighting Control		
Total Exterior Lighting Control	1,890 watts	1,200 watts
Tradable Surface Exterior Lighting Power	1,800 watts	1,200 watts
Non-Tradable Surface Exterior Lighting Power	0 watts	0 watts
Other		

ENERGY USE AND COST SUMMARY — ECON-1

Project Name: *Educational Version for Class Assignments Only*
Date: 3/29/2011

Rate: Electric Alameda H | **Fuel Type: Electricity**

	STANDARD			PROPOSED			MARGIN		
	Energy Use (kWh)	Peak Demand (kW)	Cost ($)	Energy Use (kWh)	Peak Demand (kW)	Cost ($)	Energy Use (kWh)	Peak Demand (kW)	Cost ($)
Jan	61	3	11	35	2	9	27	1	3
Feb	52	3	10	30	2	8	22	1	2
Mar	34	2	9	20	1	7	14	1	1
Apr	19	0	7	15	0	7	5	0	0
May	20	4	7	11	0	6	9	4	1
Jun	19	4	7	14	2	6	6	2	1
Jul	139	5	19	64	3	12	75	2	8
Aug	142	5	20	66	3	12	75	2	8
Sep	104	4	16	39	2	9	65	2	7
Oct	89	5	14	52	3	10	37	2	4
Nov	18	0	7	14	0	6	5	0	0
Dec	57	2	11	32	1	8	25	1	3
Year	755	5	138	391	3	100	364	2	37
CO₂	608 lbs/yr			315 lbs/yr			293 lbs/yr		

Rate: Gas PG&E P | **Fuel Type: Natural Gas**

	STANDARD			PROPOSED			MARGIN		
	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost ($)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost ($)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost ($)
Jan	43	47	54	28	38	34	16	9	20
Feb	37	49	47	23	39	29	14	10	18
Mar	32	36	40	21	30	26	11	6	14
Apr	26	38	33	18	32	22	8	6	10
May	20	5	26	14	5	18	6	0	8
Jun	19	5	24	14	5	17	5	0	8
Jul	19	5	25	14	5	17	6	0	8
Aug	19	5	25	13	5	17	6	0	8
Sep	18	5	24	13	5	16	5	0	8
Oct	19	5	25	14	5	17	6	0	8
Nov	25	38	31	16	25	20	9	14	11
Dec	44	46	54	26	33	33	17	13	21
Year	323	49	407	213	39	265	109	10	141
CO₂	3,774 lbs/yr			2,497 lbs/yr			1,277 lbs/yr		

Annual Totals	Energy	Demand	Cost	Cost/sqft	Virtual Rate
Electricity	391 kWh	3 kW	$ 100	$ 0.05 /sqft	$ 0.26 /kWh
Natural Gas	213 therms	39 kBtu/hr	$ 265	$ 0.13 /sqft	$ 1.24 /therm
Total			$ 366	$ 0.18 /sqft	

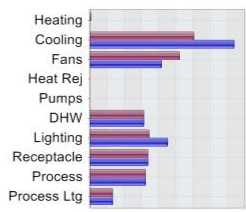|	
Avoided CO₂ Emissions:	1,570 lbs/yr

PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 2 of 3) — PERF-1C

Project Name: *Educational Version for Class Assignments Only*
Date: 4/28/2011

ANNUAL TDV ENERGY USE SUMMARY (kBtu/sqft-yr)

Energy Component	Standard Design	Proposed Design	Compliance Margin
Space Heating	0.35	1.32	-0.97
Space Cooling	167.60	120.98	46.62
Indoor Fans	83.37	104.05	-20.68
Heat Rejection	0.00	0.00	0.00
Pumps & Misc.	0.00	0.00	0.00
Domestic Hot Water	62.92	62.92	0.00
Lighting	90.33	68.95	21.37
Receptacle	67.78	67.78	0.00
Process	65.00	65.00	0.00
Process Lighting	26.81	26.81	0.00
TOTALS	564.15	517.81	46.34
Percent better than Standard	8.2 % (	9.8 % excluding process)	

BUILDING COMPLIES

GENERAL INFORMATION

Building Orientation	(N) 0 deg	Conditioned Floor Area	4,480	sqft.
Number of Stories	2	Unconditioned Floor Area	800	sqft.
Number of Systems	3	Conditioned Footprint Area	2,880	sqft.
Number of Zones	4	Natural Gas Available On Site	Yes	

	Orientation	Gross Area		Glazing Area		Glazing Ratio
Front Elevation	(N)	800	sqft.	320	sqft.	40.0 %
Left Elevation	(E)	1,040	sqft.	320	sqft.	30.8 %
Rear Elevation	(S)	1,900	sqft.	260	sqft.	13.7 %
Right Elevation	(W)	720	sqft.	0	sqft.	0.0 %
Total		4,460	sqft.	900	sqft.	20.2 %
Roof		2,880	sqft.	0	sqft.	0.0 %

	Standard	Proposed	
Prescriptive Lighting Power Density	1.157 W/sqft.	0.928 W/sqft.	Prescriptive Values for Comparison only. See LTG-1C for allowed LPD.
Prescriptive Envelope TDV Energy	143,345	164,053	

Remarks:
Standard Building (Compliance)

LEED COMPLIANCE SUMMARY (Part 4 of 5) — EAC-1

Project Name: *Educational Version for Class Assignments Only*
Date: 4/28/2011

BASELINE PERFORMANCE – PERFORMANCE RATING METHOD COMPLIANCE

End Use	Process?	Baseline Design Energy Type	Units of Annual Energy & Peak Demand	Baseline (0 deg rotation)	Baseline (90 deg rotation)	Baseline (180 deg rotation)	Baseline (270 deg rotation) Baseline Design
Cooling	☐	Electricity	kWh	28482	0	0	0
			kW	24.1	0.0	0.0	0.0
Fans	☐	Electricity	kWh	17124	0	0	0
			kW	4.0	0.0	0.0	0.0
Indoor Lighting	☐	Electricity	kWh	22167	0	0	0
			kW	4.9	0.0	0.0	0.0
Outdoor Lighting	☐	Electricity	kWh	9512	0	0	0
			kW	2.4	0.0	0.0	0.0
Process Lighting	☑	Electricity	kWh	5896	0	0	0
			kW	1.6	0.0	0.0	0.0
Process	☑	Electricity	kWh	15032	0	0	0
			kW	3.6	0.0	0.0	0.0
Receptacle	☑	Electricity	kWh	16294	0	0	0
			kW	3.5	0.0	0.0	0.0
Renewables	☐	Electricity	kWh	0	0	0	0
			kW	0.0	0.0	0.0	0.0
Domestic Hot Water	☐	NaturalGas	therms	1740	0	0	0
			kBtu/hr	63.8	0.0	0.0	0.0
Heating	☐	NaturalGas	therms	9	0	0	0
			kBtu/hr	49.8	0.0	0.0	0.0
	☐						
	☐						
	☐						

BASELINE ENERGY COSTS

Energy Type	Baseline Cost (0 deg rotation)	Baseline Cost (90 deg rotation)	Baseline Cost (180 deg rotation)	Baseline Cost (270 deg rotation)	Baseline Building Performance
Electricity	29875				29875
NaturalGas	1896				1896
Total Baseline Costs:	31771	0	0	0	31771