

EnergyPro Lite v4

A “Low-Cost Assessment Tool” to identify energy upgrade opportunities in existing multifamily buildings

CALBEM 2019

EnergyPro Lite History

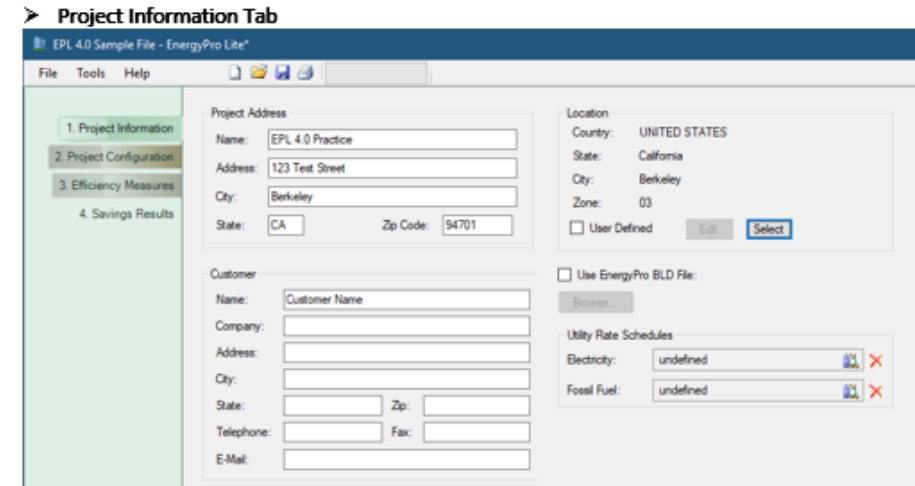
- **2011 - Recommendation MF-HERCC Report**
- **2013 - Launched v1.0 with Bay Area Multifamily Building Enhancement (BAMBE/BayREN) Program**
- **2018/19 - Version 3.1 shared with PG&E's Multifamily Upgrade Program (MUP) and its Raters**
- **2019 - Version 4 release Q4**

CEC Grant-funded updates for v4

- **Previously external calculations internalized – lighting, DHW pump control, pipe insulation, among others**
- **Electrification, especially central HPWH**
- **Owner-facing report output and auto-check report**
- Building leakage/ACH
- DHW - pump controls, tenant usage modification
- Laundry – separate water heater and upgrades
- Water savings
- Smart thermostat

User Manual

- Intended to give EnergyPro v5 and later (“Full”) users capability to model existing multifamily buildings in 1-2hrs



Project Address

Name: [EPL 4.0 Practice](#)

Address, City, State, Zip Code

Fill in the project address information

Location

Climate Zone selection

Click Select [from Location Library]: [Berkeley](#)

Customer

Name, Company, Address, City, State, Zip, Telephone, E-Mail

Enter the relevant customer information. This information will be populated on the [Energy Report](#).

Utility Rate Schedules

Select the electricity and natural gas rates for the project. When choosing a utility rate click on the hour glass icon and select a rate that is in the software. Do not change anything in these rates. The rates are frequently updated in the software. See the [Schedule Library](#) for additional data input details.

Use EnergyPro/BLD File check box

See ["Import and Export Files to EnergyPro 5"](#)

Needs translation

Energy Upgrade Report							EPL-1	
Project Name Sample Project 1		Building Type <input checked="" type="checkbox"/> Low-rise <input type="checkbox"/> High-rise		Year Built 1970	Date 6/13/2019			
Project Address 2281 Tulare Street Fresno, CA 93724		California Energy Climate Zone CA Climate Zone 13	Total Cond. Floor Area 25,000	# of Units 30	# of Stories 2			
		Site Energy (kBtu/ft ² -yr)	Existing 63.2	Improved 28.6	Savings 64.0			
Quant.	Recommended Improvement	Savings						
		Calculated			Deemed			
		kWh	kW	therms	kWh	kW	therms	Site
	Roof Insulation: Type = R-38 Roof Abs: Cavity Insulation = 38.0 R-Value Interior Insulation = 0.0 R-Value Exterior Insulation = 0.0 R-Value	31,268	10.7	1,755				14.1 %
	Windows: Type = T-24 Window Upgrade U-Factor = 0.300 SHGC = 0.25	34,504	14.5	181				20.9 %
	Domestic Hot Water Heater: Name = Heat Pump 200 Gal DRW Type = Central Heat Pump Volume = 200.0 gal Efficiency = 370.0 %	-25,141	-2.4	3,777				35.5 %
	Pool Heater: Name = Pool Heater Input = 36,000 Btu/h Efficiency = 350.0 %	0	0.0	4,117				56.1 %
	Water Savings: Name = Water Savings	1,875	0.2	0				56.5 %
	HVAC Duct Leakage: Leakage = 5 % Leakage Rate at 25 Pascals = 0 cfm	10,492	5.9	423				60.4 %
	Smart Thermostat	4,662	2.5	217				62.3 %
	Appliances: Indoor Refrigerator = 320 kWh Garage Refrigerator = 0 kWh Dishwasher = 0.48 EF	7,950	1.1	-100				63.1 %
	Apartment Lighting: Indoor Lighting Type = High Efficiency	4,783	0.1	-27				63.8 %
	HVAC System: Name = High Efficiency Heat Pump Type = Split DX Heating + Split Heat Pump Efficiency = 8.80 HSPF Cooling + Split Heat Pump SEER = 14.00 EER = 12.00	-47,861	-20.1	1,718				64.2 %
	Common-Exterior Lighting: Outdoor Lighting Type = High Efficiency	-2,454	0.0	0				63.8 %
	DRW Recirculation: DRW Recirc Type = Demand Pump Motor = 0.12 BHP	4,669	0.5	0				64.6 %
	Pool Cover: Name = Pool Cover Area = 580.0 sqft	0	0.0	236				65.8 %
Annual Results		Electricity (kWh)			Fossil Fuel (therms)			
End Use	Existing	Improved	Savings	Existing	Improved	Savings		
Space Heating	0	64,227	-64,227	4,165	0	4,165		
Space Cooling	105,612	8	105,605	0	0	0		
Fans	12,032	0	12,032	0	0	0		
Pumps	6,006	6,006	1,200	0	0	0		
Domestic Hot Water	0	19,877	-19,877	3,777	0	3,777		
Indoor Lighting	3,117	1,081	2,037	0	0	0		
Outdoor Lighting	0	0	0	0	0	0		
Appliances/Plug Loads	16,604	9,600	6,999	0	0	0		
Ancillary	48,606	48,606	0	6,381	1,029	4,362		
Renewables	0	0	0	0	0	0		
TOTAL	194,956	170,207	24,749	13,326	1,029	12,297		

The estimated consumption numbers shown in this report are dependent upon many factors. The construction and conservation features of the project clearly are important. Equally important is the thermostat setting. How the thermostat is used, appliance use, and occupant interaction all influence the annual operating cost. The estimates provided in this report are based on typical conditions; your actual usage will vary.

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ENERGY USE AND COST SUMMARY										ECON-1		
Project Name Sample Project 1		Date 5/13/2019		Fuel Type: Electricity						MARGIN		
Rate:		STANDARD			PROPOSED			MARGIN				
Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	Energy Use (kWh)	Peak Demand (kW)	Cost (\$)	
Jan			7,030	18.8								
Feb			6,160	18.2								
Mar			5,637	41.7								
Apr			12,890	64.0								
May			20,690	76.0								
Jun			26,690	79.3								
Jul			32,690	78.0								
Aug			29,038	76.4								
Sep			21,426	69.3								
Oct			16,126	64.4								
Nov			6,626	19.0								
Dec			7,063	19.6								
Year			194,956	79.3								
CO ₂	lbs/yr			lbs/yr				lbs/yr				
Rate:		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 (\$)	Energy Use (therms)	Peak Demand (kBtu/hr)	Cost (\$)	
Jan			2,694	1,106.6								
Feb			1,469	856.4								
Mar			1,161	811.3								
Apr			799	426.7								
May			604	213.6								
Jun			466	164.4								
Jul			376	140.7								
Aug			400	137.2								
Sep			463	156.9								
Oct			540	331.3								
Nov			1,497	766.1								
Dec			2,788	1,169.1								
Year			13,326	1,169.1								
CO ₂	lbs/yr			lbs/yr				lbs/yr				
Annual Totals		Energy	Demand	Cost	Cost/sqft	Virtual Rate						
Electricity	194,956 kWh	79 kW	\$ 0	\$ 0.00/sqft	\$ 0.00/kWh							
Natural Gas	13,326 therms	1,169 kBtu/hr	\$ 0	\$ 0.00/sqft	\$ 0.00/therm							
		Total	\$ 0	\$ 0.00/sqft								
Avoided CO₂ Emissions: lbs/yr												
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Energy Upgrade Recommendations										ECON-2		
Project Name Sample Project 1		Documentation Author StopWaste		Project Address 2281 Tulare Street Fresno, CA 93724		Author Address 3000 Warwick Ave Oakland, CA 94610						
Recommended Improvements	Description	Annual Savings	Est. Cost to Install	Savings \$/ft ²	TDV							
Roof Insulation	Type = R-38 Roof Abs: Cavity Insulation = 38.0 R-Value Interior Insulation = 0.0 R-Value Exterior Insulation = 0.0 R-Value	\$0	\$0	14.1 %	16.8 %							
Windows	Type = T-24 Window Upgrade U-Factor = 0.300 SHGC = 0.25	\$0	\$0	20.9 %	25.3 %							
Domestic Hot Water Heater	Name = Heat Pump 200 Gal DRW Type = Central Heat Pump Volume = 200.0 gal Efficiency = 370.0 %	\$0	\$0	35.5 %	32.2 %							
Pool Heater	Name = Pool Heater Input = 36,000 Btu/h Efficiency = 350.0 %	\$0	\$0	56.1 %	43.6 %							
Water Savings	Name = Water Savings	\$0	\$0	56.5 %	44.2 %							
HVAC Duct Leakage	Leakage = 5 % Leakage Rate at 25 Pascals = 0 cfm	\$0	\$0	60.4 %	49.5 %							
Smart Thermostat	Indoor Refrigerator = 320 kWh Garage Refrigerator = 0 kWh Dishwasher = 0.48 EF	\$0	\$0	62.3 %	61.6 %							
Appliances	Indoor Refrigerator = 320 kWh Garage Refrigerator = 0 kWh Dishwasher = 0.48 EF	\$0	\$0	63.1 %	63.6 %							
Apartment Lighting	Indoor Lighting Type = High Efficiency	\$0	\$0	63.8 %	64.7 %							
HVAC System	Name = High Efficiency Heat Pump Type = Split DX Heating + Split Heat Pump Efficiency = 8.80 HSPF Cooling + Split Heat Pump SEER = 14.00 EER = 12.00	\$0	\$0	64.2 %	62.3 %							
Common-Exterior Lighting	Outdoor Lighting Type = High Efficiency	\$0	\$0	63.8 %	61.6 %							
DRW Recirculation	DRW Recirc Type = Demand Pump Motor = 0.12 BHP	\$0	\$0	64.6 %	63.0 %							
Pool Cover	Name = Pool Cover Area = 580.0 sqft	\$0	\$0	65.8 %	63.6 %							
Annual Results		Energy Cost			Electricity (kWh)			Fossil Fuel (therms)				
End Use	Existing	Improved	Savings	Existing	Improved	Savings	Existing	Improved	Savings			
Space Heating	0	64,227	-64,227	4,165	0	4,165	0	0	0			
Space Cooling	105,612	8	105,605	0	0	0	0	0	0			
Fans	12,032	0	12,032	0	0	0	0	0	0			
Pumps	6,006	6,006	1,200	0	0	0	0	0	0			
Domestic Hot Water	0	19,877	-19,877	3,777	0	3,777	0	0	0			
Indoor Lighting	3,117	1,081	2,037	0	0	0	0	0	0			
Outdoor Lighting	0	0	0	0	0	0	0	0	0			
Appliances/Plug Loads	16,604	9,600	6,999	0	0	0	0	0	0			
Ancillary	48,606	48,606	0	6,381	1,029	4,362	0	0	0			
Renewables	0	0	0	0	0	0	0	0	0			
TOTAL	194,956	170,207	24,749	13,326	1,029	12,297						
CO ₂ (lbs/year)	Existing	Improved	Savings									
Electricity	0	0	0									
Fossil Fuel	0	0	0									
TOTAL	0	0	0									
Average Demand (kW)	61.87	8.37	63.20									
TDV Energy (kBtu/ft ² -yr)	228.36	104.97	121.39									
Climate Zone:				13	Improvements above shown with cumulative savings benefit for combined measures							
Electric Rate:												
Gas Rate:				24,000								
Floor Area:				Highrise Res								
Type:												

The estimated operating costs shown in this report are dependent upon many factors. The construction and conservation features of the project clearly are important. Equally important is the thermostat setting. How the thermostat is used, appliance use, and occupant interaction all influence the annual operating cost. The estimates provided in this report are based on typical conditions; your actual usage will vary.

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Owner-Facing Report (OFR)

Energy Upgrade Report for: <i>Sample Project 1</i>	Prepared for: <i>Customer Name</i> <i>Company</i> <i>Address, Fresno, CA 93724</i> <i>(XXX) XXX-XXXX</i>	Prepared By: <i>Ben Cooper</i> <i>StopWaste</i> <i>3000 Warwick Ave, Oakland, CA 94610</i> <i>510-891-6500</i> <i>bcooper@stopwaste.org</i>

Project Information

<i>2281 Tulare Street, Fresno, CA 93724</i>	
Total # of dwelling units <i>30</i>	Total residential sq.ft. (comm. area and units) <i>25,000</i>
# of buildings <i>1</i>	Year built <i>1970</i>

Savings Summary & GHG Equivalencies

Total estimated site savings	65.8 %
Annual GHG savings	75.9 MTCO ₂
GHG equivalency	8,554 Gallons of gasoline 

Project Scope

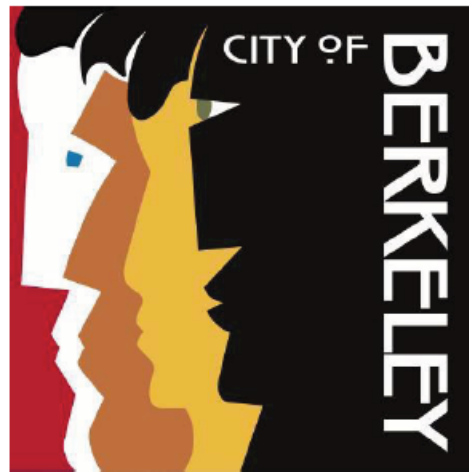
	Measure	Est. kWh Savings/yr	Est. Therm Savings/yr	Water Savings (gal)	Est. Site Savings (%)
1	<i>Roof Insulation: R-38 Attic Insulation</i>	31,268	1,755	0	14.1 %
2	<i>Windows: Title 24 Compliant Windows; 0.32 U-factor, 0.25 SHGC</i>	34,504	181	0	6.8 %
3	<i>Domestic Hot Water Heater: Heat Pump Central Water Heater</i>	-25,141	3,777	0	14.6 %
4	<i>Pool Heater: Heat Pump Pool Heater</i>	0	4,117	0	20.6 %
5	<i>Water Savings: 0.8 GPF Toilets, 1.75 GPM Showerheads, 1.0 GPM Bath Aerators, 1.5 GPM Kitchen Aerators</i>	1,875	0	370,404	0.3 %
6	<i>HVAC Duct Leakage: 5% Duct Leakage</i>	10,492	423	0	3.9 %
7	<i>Smart Thermostat: Energy Star Smart Thermostat</i>	4,662	217	0	1.9 %
8	<i>Appliances: 320 kWh/yr Refrigerator Upgrade</i>	7,950	-100	0	0.9 %
9	<i>Apartment Lighting: LED Lighting Upgrade</i>	4,783	-27	0	0.7 %
10	<i>HVAC System: High Efficiency Heat Pump</i>	-47,861	1,718	0	0.4 %
11	<i>Common-Exterior Lighting: LED Lighting Upgrade</i>	-2,454	0	0	-0.4 %
12	<i>DHW Recirculation: Demand Control Recirculation Control</i>	4,669	0	0	0.8 %
	TOTALS	24,748	12,296	370,404	65.8 %

TERMS: GHG: Greenhouse gas MTCO₂: Metric tons of carbon dioxide Measure: Equipment or building upgrade that reduces energy and/or water use Kilowatt-hour (kWh): Typical units of electricity Therm: Typical units of natural gas Site savings: Reduction in whole-building energy use DHW: Domestic hot water HVAC: Heating, ventilation and air conditioning

Current Users



Multifamily
Upgrade
Program



➤ SoCalREN Multifamily Program 2020

EPLv4.1 Potential Updates (2020)

➤ **Measure Cost**

- Wizard
- Addition of input field for actual bid costs, user-provided cost data

➤ **Utility rate**

- IOU-specific
- TOU

➤ **Renewables**

➤ **Payback analysis**

➤ **Output Report Updates**

- Graphs

THANK YOU!

For more information, contact:

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