

Clean Energy Project Analysis Software

Project information

[See project database](#)

Project name	House example integrated system
Project location	Toronto, Canada
Prepared for	website example
Prepared by	FreeFuelForever.com
Project type	Heating
Technology	Solar water heater
Analysis type	Method 1
Heating value reference	Higher heating value (HHV)
Show settings	<input checked="" type="checkbox"/>
Language - Langue	English - Anglais
User manual	English - Anglais
Currency	\$
Units	Metric units

Site reference conditions

[Select climate data location](#)

Climate data location	Toronto Int'l Airport
Show data	<input checked="" type="checkbox"/>

Climate data

	Unit	location	Project location
Latitude	°N	43.7	43.7
Longitude	°E	-79.6	-79.6
Elevation	m	173	173
Heating design temperature	°C	-16.7	
Cooling design temperature	°C	28.9	
Earth temperature amplitude	°C	21.3	

Month	Air temperature		Relative humidity	Daily solar radiation - horizontal	Atmospheric pressure	Wind speed	Earth temperature	Heating degree-days	Cooling degree-days
	°C	°C	%	kWh/m²/d	kPa	m/s	°C	°C-d	°C-d
January	-5.8		77.0%	1.68	98.7	5.0	-7.6	738	0
February	-5.0		74.9%	2.28	98.8	4.6	-5.9	644	0
March	-0.2		71.8%	3.60	98.7	4.8	-0.1	564	0
April	6.4		66.3%	4.90	98.5	4.8	7.4	348	0
May	13.2		66.3%	5.36	98.6	4.0	13.8	149	99
June	18.2		68.4%	5.82	98.6	3.7	18.7	0	246
July	21.1		68.0%	6.18	98.6	3.5	20.9	0	344
August	20.1		72.2%	5.28	98.8	3.2	19.5	0	313
September	15.5		74.9%	3.90	98.8	3.5	15.1	75	165
October	9.0		76.0%	2.50	98.8	3.8	8.8	279	0
November	3.4		78.3%	1.28	98.7	4.4	2.6	438	0
December	-2.5		78.9%	1.18	98.7	4.5	-4.3	636	0
Annual									
Measured at	m	7.9	72.7%	3.67	98.7	4.1	7.5	3,871	1,167
						10.0	0.0		



[Complete Energy Model sheet](#)

RETScreen4 Beta 2007-10-26

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RETScreen Energy Model - Heating project

Heating project		Solar water heater	
Technology			
Load characteristics			
Application	<input type="radio"/> Swimming pool <input checked="" type="radio"/> Hot water		
	Unit	Base case	Proposed case
Load type			
Number of units	Occupant	House	
Occupancy rate		4	
Daily hot water use - estimated		100%	
Daily hot water use	L/d	240	
Temperature	°C	240	240
Operating days per week	d	60	60
		7	7
<input type="checkbox"/> Percent of month used			
Supply temperature method	Formula		
Water temperature - minimum	°C	3.1	
Water temperature - maximum	°C	12.5	
Heating	Unit	Base case	Proposed case
	MWh	5.3	5.3
	Energy saved	0%	
	Incremental initial costs	\$ -	
Resource assessment			
Solar tracking mode	Fixed		
Slope		45.0	
Azimuth		0.0	
<input type="checkbox"/> Show data			
Solar water heater			
Type	Evacuated		\$ 1,885
Manufacturer	Tsinghua		
Model	JR208		
Gross area per solar collector	m²	3.57	
Aperture area per solar collector	m²	2.69	
Fr (tau alpha) coefficient		0.45	
Fr UL coefficient	(W/m²)°C	1.22	
Temperature coefficient for Fr UL	W/(m²·°C)²	0.006	
Number of collectors		1	2
Solar collector area	m²	3.57	
Capacity	kW	1.88	
Miscellaneous losses	%	3.0%	
Balance of system & miscellaneous			
Storage	Yes		
Storage capacity / solar collector area	L/m²	75	
Storage capacity	L	201.8	
Heat exchanger	yes/no	No	
Miscellaneous losses	%	0.0%	
Pump power / solar collector area	W/m²	0.00	
Electricity rate	\$/kWh	0.000	
Summary			
Electricity - pump	MWh	0.0	
Heating delivered	MWh	1.7	
Solar fraction	%	32%	
<input type="checkbox"/> Heating system			
Project verification	Base case Proposed case		
Fuel type	Electricity	Electricity	
Seasonal efficiency	100%	100%	\$ -
Fuel consumption - annual	MWh	5.3	3.6
Fuel rate	\$/kWh	0.120	0.120
Fuel cost	\$	639	433

[See technical note](#)
[See product database](#)

Emission Analysis

Financial Analysis

Financial parameters			
Inflation rate	%	7.0%	
Project life	yr	25	
Debt ratio	%	0%	
Initial costs			
Heating system	\$	1,885	100.0%
Other	\$	0	0.0%
Total initial costs	\$	1,885	100.0%
Incentives and grants			
	\$		0.0%
Annual costs and debt payments			
O&M (savings) costs	\$		
Fuel cost - proposed case	\$	433	
Other	\$		
Total annual costs	\$	433	
Annual savings and income			
Fuel cost - base case	\$	639	
Other	\$	50	
Total annual savings and income	\$	689	
Financial viability			
Pre-tax IRR - assets	%	20.9%	
Simple payback	yr	7.3	
Equity payback	yr	5.8	

