

Solar BC says Buyer Beware

Here are some tips for solar customers to protect themselves from a bad system or a bad installation company.

Prior to any agreements or contracts, all parties should check with their local regulatory officials about the system that they are interested in having installed. They should also check to ensure that the company installing the system is in good standing with the local municipality and inspectors.

Some of the systems listed below may require additional engineering reports (structural, B1, B2 or schedule C) or additional backflow protection. Some municipalities in the CRD are not accepting RP valves and are insisting on double wall with leak detection only.

They should also ensure that their contractor has a permit and that all work is inspected so that the new system meets all regulatory requirements. This may sound obvious but many contractors are currently installing without permits or regards to the regulatory upgrades. Systems installed without a permit will void home insurance if there is a problem.

Once everyone decides on a system they should calculate the payback for their systems. Below is some comparison information on maintenance, payback or return on investment that everyone should be interested in.

Maintenance Comparison Facts:

- Every solar thermal system should be tested annually and it is best to test these systems in the spring to ensure the best performance and protection during the summer season.
- System checks can cost in the neighborhood of \$40 to \$50 each year.
- Unchecked systems can damage all of the components of the solar thermal system that have contact with the glycol including the line-set, pump, heat exchanger and collector.
- the best solar thermal systems can save \$500 to \$600 a year on DHW heating costs.
- Maintenance for replacing glycol or damaged components can greatly reduce or eliminate solar gains or savings on most systems.
- Pumps are the only moving components in the system and likely the only component that will need to be replaced in the first 10 to 20 years, (if systems are properly installed and maintained). It is the high heat, glycol pH and pressures that the pumps deal with when pumping glycol that is harmful on the pumps. Factoring in the cost of pump replacement is also important for calculating system payback or return on investment. I suggest that all customers ask their contractors for estimates in writing on pump replacements. For example the SSV Hydronic pump costs less than \$100 but the Enerworks Hydronic induction pump is \$650.

Evacuated Tube Collector Maintenance

Every ETC system should be checked annually and most systems will require new glycol every year. ETC systems without a good heat dump like a pool will likely have heat damaged glycol. Glycol replacement costs about **\$200 to \$300 a year**. Glycol for ETC costs \$75 per gallon and most systems will require 2-3 gallons. Over heating is the biggest concern of these systems;

commercial installations of ETC are not as much of a concern because of system demand and use.

Flat Panel Collector Maintenance

Every FPC system should be checked annually and most systems will require new glycol every 2-3 years. FPC systems do not overheat as badly as the ETC but still require checking. Glycol replacement averages about **\$100 a year** and most systems will also require about 2-3 gallons.

Swiss Sol-Viessmann Maintenance

SSV systems should also be checked annually however these systems require new glycol every 8-12 years. We are training our customers to check and monitor their own system to help reduce the costs of maintenance and checking the glycol. Glycol replacement averages about **\$10 a year** and these systems also require about 2-3 gallons but they require it a lot less often.

It is also a good idea to factor in the life span of the system; the flat plate collector systems have been used for the last 100+ years. Current ETC technology has only been around for about 5 years. Systems similar to SSV are installed over 200,000 times in Europe every year and Roger from SST has 30 years experience installing these systems. We expect the SSV system to last at least 40+ years and we often see flat plate collectors installed in the 1970's that work perfectly today

SSV also has the only single tank application on the market that works. Roger has designed these systems and has the experience to ensure that the single tank system works. The single tank systems are only practical for homes with one to two people or homes that have no space for an additional solar tank. They will be less efficient than a two-tank system, but it will work when there are no other options.

System Payback or Return on Investment BTU/ Dollar

This information is available on the SRCC web site and we use it to help all of our customers decide which system is the best investment.

One method for comparing collectors/systems involves the coupling of the performance rating with the cost of the product. This provides the consumer with another gauge of the collector's value, i.e., the MJ/\$ or Btu/\$ ratio. This can be easily computed. Simply divide the thermal performance rating of the system by its cost. This will give you a ratio of megajoules or Btu per dollar. For example, say System "XYZ" was being selected for a domestic hot water application. The rating in the 2,000 Btu/ft² and A (-9°F) box in the SRCC label reports 27.5 (27,500 Btu per day per panel), let us say. Furthermore, let us say that the unit sells for \$387.

$$\text{Then: } \frac{27500 \text{ Btu}}{\$387} = 71.06 \text{ Btu/Dollar}$$

By doing this same calculation for another collector panel, one can compare its performance per dollar. We can also do the same comparison for individual systems based on the 2200 hours of sunshine that we receive on Southern Vancouver Island. Here are a few examples of the systems that we install, the Eco Energy and SRCC web site rates these collectors at the following performance.

30 tube ETC at 6090 BTU/ hour or 36,700 BTU on average a day.

Enerworks at 5460 BTU/ hour or 32,900 BTU on average a day.

SSV system at 7000 BTU/ hour or 42,000 BTU on average a day.

Now if we compare these numbers to the cost of the system it will give us a BTU rate for each dollar spent, the higher the BTU the better the system, for example;

ETC $\frac{36,700 \text{ BTU}}{\$9,000} = 4.08 \text{ BTU/ Dollar per day or } 1489 \text{ BTU/Dollar per year}$

Enerworks $\frac{33,000 \text{ BTU}}{\$7000} = 4.70 \text{ BTU/ Dollar per day or } 1715 \text{ BTU/Dollar per year}$

Swiss Sol-Viessmann $\frac{42,000 \text{ BTU}}{\$8000} = 5.25 \text{ BTU/Dollar per day or } 1916 \text{ BTU/Dollar per year}$

Dual panel systems are even more impressive on the savings for system comparison.

ETC $\frac{73,400 \text{ BTU}}{\$12,000} = 6.12 \text{ BTU/ Dollar per day or } 2234 \text{ BTU/Dollar per year}$

Enerworks $\frac{66,000 \text{ BTU}}{\$9000} = 7.33 \text{ BTU/ Dollar per day or } 2675 \text{ BTU/Dollar per year}$

Swiss Sol-Viessmann $\frac{84,000 \text{ BTU}}{\$10,000} = 8.40 \text{ BTU/Dollar per day or } 3066 \text{ BTU/Dollar per year}$

The Eco Energy web site rates the following collector performance.

Manufacturer	Performance	Collector Size (Area m2)	BTU/hour
Apricus	.87	4.05	6090
Enerworks	.78	2.87	5460
Globe Solar	.59	3.51	4130
Thermomax	.71	4.47	4970
Carearth	.70	4.96	4900
Viessmann	1.00	2.52	7000
Sunda	.90	4.09	6300
Thermodynamics	.69	2.98	4830

- Viessmann systems are the smallest collectors with the best performance of the entire group.
- The Enerworks **Commercial** collector has a higher performance rating of (1.07) but this collector costs almost twice the amount of the Viessmann and is not currently available in a residential system.