Results of Annual Simulation

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed Collector Power:</td>
<td>163.87 kBtu/hr</td>
</tr>
<tr>
<td>Installed Gross Solar Surface Area:</td>
<td>738.5 sq.ft</td>
</tr>
<tr>
<td>Collector Surface Area Irradiation (Active Surface):</td>
<td>240.25 MMBTU</td>
</tr>
<tr>
<td>Energy Produced by Collectors:</td>
<td>177.60 MMBTU</td>
</tr>
<tr>
<td>Energy Produced by Collector Loop:</td>
<td>176.84 MMBTU</td>
</tr>
<tr>
<td>DHW Heating Energy Supply:</td>
<td>452.83 MMBTU</td>
</tr>
<tr>
<td>Solar Contribution to DHW:</td>
<td>173.54 MMBTU</td>
</tr>
<tr>
<td>Energy from Auxiliary Heating:</td>
<td>288.94 MMBTU</td>
</tr>
<tr>
<td>Propane Gas Savings:</td>
<td>3,022.7 m³</td>
</tr>
<tr>
<td>Propane Gas Savings:</td>
<td>2,680.26 therm</td>
</tr>
<tr>
<td>CO2 Emissions Avoided:</td>
<td>39,696.95 lbs</td>
</tr>
<tr>
<td>DHW Solar Fraction:</td>
<td>37.5 %</td>
</tr>
<tr>
<td>Fractional Energy Saving (EN 12976):</td>
<td>37.7 %</td>
</tr>
<tr>
<td>System Efficiency:</td>
<td>72.2 %</td>
</tr>
</tbody>
</table>
Basic Data

Climate File
Location: Washington DC
Climate Data Record: "Washington DC"
Total Annual Global Radiation: 5.46 MMBTU
Latitude: 38.98 °
Longitude: 77.47 °

Domestic Hot Water
Average Daily Consumption: 2100 gal
Desired Temperature: 130 °F
Load Profile: Multiple Dwelling
Cold Water Temperature: February:55 °F / August:63 °F
Circulation: No

System Components

Collector Loop
Manufacturer: SunMaxx Solar
Type: ThermoPower-VHP30
Number: 14.00
Total Gross Surface Area: 738.5 sq.ft
Total Active Solar Surface Area: 420.56 sq.ft
Tilt Angle: 37 °
Azimuth: 10 °

DHW Standby Tank
Manufacturer: T*SOL Database
Type: Existing Hot Water Heater
Volume: 1000 gal

Solar Preheating Tank
Manufacturer: SunMaxx Solar Inc.
Type: StorMaxx NP
Volume: 2500 gal

Auxiliary Heating
Manufacturer: T*SOL Database
Type: Gas Boiler - 9
Nominal Output: 150 kBTU/hr

Legend
Original T*SOL Database
With Test Report
Solar Keymark
Solar Energy Consumption as Percentage of Total Consumption

These calculations were carried out by T*SOL Pro 4.5 - the Simulation Programme for Solar Thermal Heating Systems. The results are determined by a mathematical model calculation with variable time steps of up to 6 minutes. Actual yields can deviate from these values due to fluctuations in climate, consumption and other factors. The system schematic diagram above does not represent and cannot replace a full technical drawing of the solar system.

Daily Maximum Collector Temperature
**Energy Balance Schematic**

---

**Legend**

1. **Collector Surface Area Irradiation (Active Surface)**: 2,411 therm
2. **Optical Collector Losses**: 470 therm
3. **Thermal Collector Losses**: 15,871 kBtu
4. **Energy from Collector Array**: 1,783 therm
5. **Solar Energy to Preheating Tank**: 1,775 therm
6. **Internal Piping Losses**: 509 kBtu
7. **External Piping Losses**: 253 kBtu
8. **Tank Losses**: 9,627 kBtu
9. **Preheating Tank to Tank**: 1,742 therm
10. **Tank Losses (S)**: 3,238 kBtu
11. **Final Energy**: 4,088 therm
12. **Supplementary Energy to Tank**: 2,900 therm
13. **Heating Element**: 0 kBtu
14. **DHW Energy from Tank**: 4,545 therm
Glossary

1 Collector Surface Area Irradiation (Active Surface)
   Energy Irradiated onto Tilted Collector Area (Active Solar Surface)

1.1 Optical Collector Losses
   Reflection and Other Losses

1.2 Thermal Collector Losses
   Heat Conduction and Other Losses

2 Energy from Collector Array
   Energy Output at Collector Array Outlet (i.e. Before the Piping)

2.2 Solar Energy to Preheating Tank
   Collector Array Energy Minus Piping Losses

2.5 Internal Piping Losses
   Internal Piping Losses

2.6 External Piping Losses
   External Piping Losses

3.1 Tank Losses
   Heat Losses via Surface Area

3.3 Preheating Tank to Tank
   Heat from Preheating Tank to Tank

4.1 Tank Losses (S)
   Heat Losses via Surface Area

6 Final Energy
   Final Energy Current into System. This can flow in as natural gas, oil or electricity (not including solar energy) taking efficiency levels into account

6.1 Supplementary Energy to Tank
   Supplementary Energy (e.g. Boiler) to Tank

6.5 Heating Element
   Energy from Heating Element

9 DHW Energy from Tank
   Heat for DHW Appliances from Tank (Excluding Circulation)