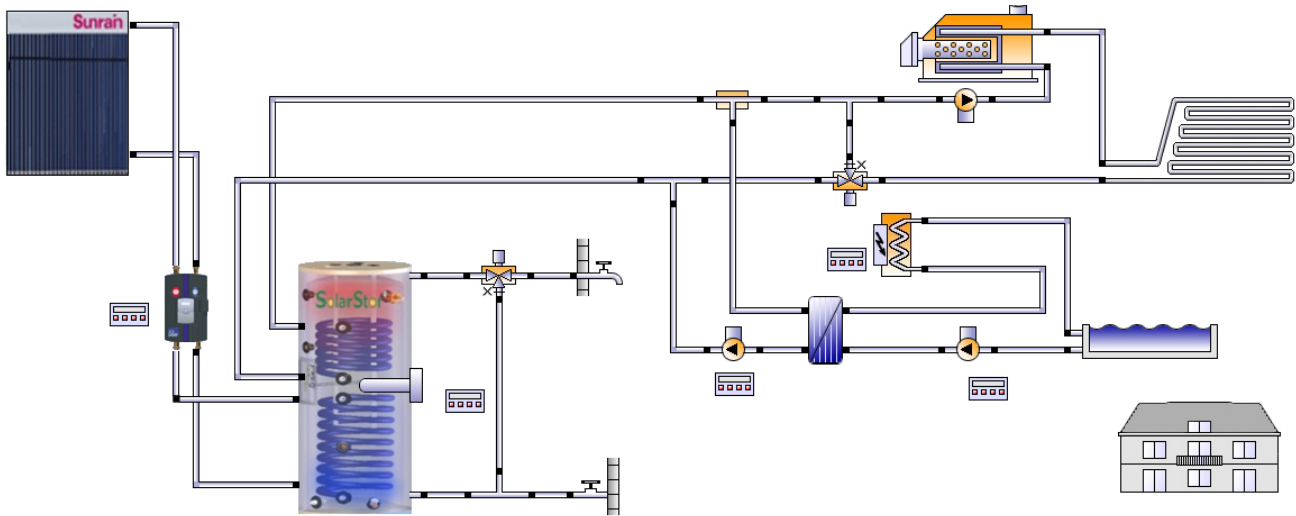


# Short Report

Northern Lights Solar Solutions

SWH + 2nd loop boiler + Pool/Hot Tub



## This report has been created by:

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## Location of the system

Thompson, UT  
Longitude: -109.615°  
Latitude: 39°  
Elevation: 5,197 ft

## System overview (annual values)

|   |                       |
|---|-----------------------|
| Total fuel and/or electrical energy consumption of the system [E <sub>tot</sub> ] | 53,279.2 kBtu         |
| Comfort demand  | Energy demand covered |

## Overview solar thermal energy (annual values)

|   |  |
|---|--|
| Collector area                                  | 225.6 ft <sup>2</sup>                      |
| Solar fraction total                            | 59.7%                                      |
| Solar fraction hot water [SF <sub>nHw</sub> ]   | 71.3 %                                     |
| Solar fraction building [SF <sub>nBd</sub> ]    | 33.9 %                                     |
| Total annual field yield                        | 63,687.7 kBtu                              |
| Collector field yield relating to gross area    | 282.3 kBtu/ft <sup>2</sup> /Year           |
| Collector field yield relating to aperture area | 495.9 kBtu/ft <sup>2</sup> /Year           |
| Max. fuel savings                               | 26,019.6 ft <sup>3</sup> : [Natural gas H] |
| Max. energy savings                             | 74,065.6 kBtu                              |
| Max. reduction in CO <sub>2</sub> emissions     | 20,470.5 pound                             |

## Meteorological data-Overview

|                             |         |
|-----------------------------|---------|
| Average outdoor temperature | 54.3 °F |
|-----------------------------|---------|

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|                                 |                            |
|---------------------------------|----------------------------|
| Global irradiation, annual sum  | 610.8 kBtu/ft <sup>2</sup> |
| Diffuse irradiation, annual sum | 150.1 kBtu/ft <sup>2</sup> |

## Component overview (annual values)

| <b>Boiler 1</b>                               | <b>Gas boiler 20kW without internal pump</b> |          |
|---|--|----------|
| Power   | kBtu/hr                                      | 68.26    |
| Total efficiency                              | %  | 81       |
| Fuel and electrical energy consumption [Eaux] | kBtu   | 35,802.3 |

| <b>Boiler 2</b>                               | <b>Continuous electric flow heater 6kW</b> |         |
|---|--|---------|
| Power   | kBtu/hr                                    | 20.48   |
| Total efficiency                              | %  | 92.9    |
| Fuel and electrical energy consumption [Eaux] | kBtu                                       | 8,345.5 |

| <b>Collector North America</b>         | <b>TZ58/1800-30R</b> |           |
|--|----------------------|-----------|
| Total area                             | ft <sup>2</sup>      | 225.61    |
| Total aperture area                    | ft <sup>2</sup>      | 128.435   |
| Tilt angle (hor.=0°, vert.=90°)        | °                    | 30        |
| Orientation (E=+90°, S=0°, W=-90°)     | °                    | 0         |
| Collector field yield [Qsol]           | kBtu                 | 63,687.7  |
| Irradiation onto collector area [Esol] | kBtu                 | 165,298.6 |

| <b>Building</b>                            | <b>Single family house, normal building</b> |          |
|--|---|----------|
| Heated/air-conditioned living area         | ft <sup>2</sup>                             | 1,500    |
| Heating setpoint temperature               | °F  | 70       |
| Heating energy demand excluding DHW [Qdem] | kBtu  | 34,925.3 |

| <b>Convector</b>                           | <b>Floor heating 1000W</b> |          |
|--|----------------------------|----------|
| Net energy from/to heating/cooling modules | kBtu                       | 34,472.8 |

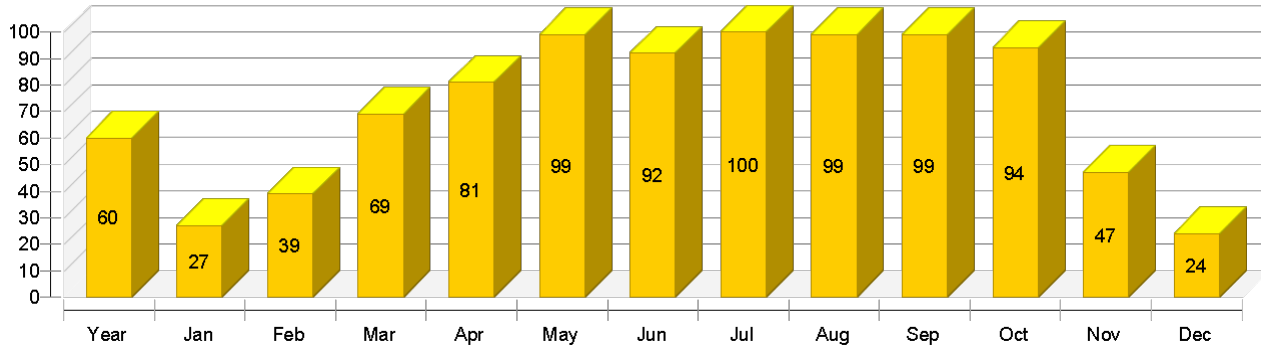
  

| <b>Hot water demand</b>             | <b>Constant</b> |          |
|-------------------------------------|-----------------|----------|
| Volume withdrawal/daily consumption | gal/d           | 60.2     |
| Temperature setting                 | °F              | 120      |
| Energy demand [Qdem]                | kBtu            | 12,045.1 |

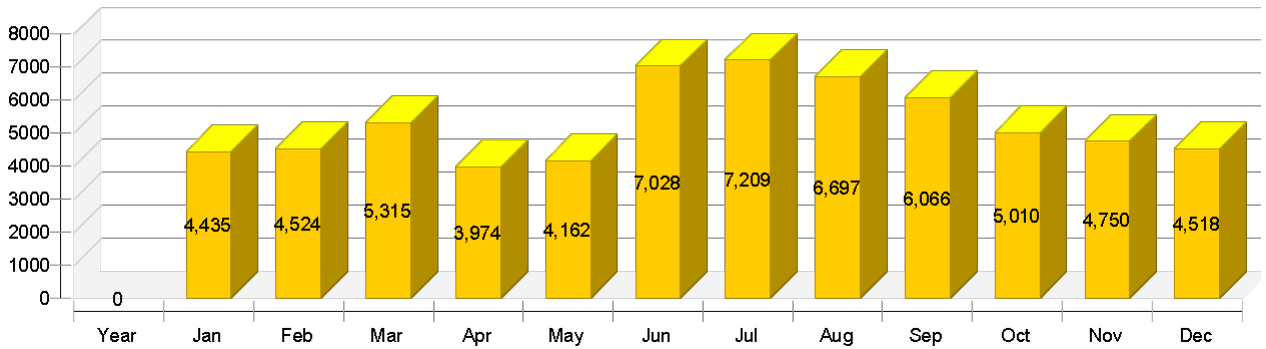
| <b>Pool</b>                      | <b>Outdoor pool</b> |              |
|----------------------------------|---------------------|--------------|
| Pool type                        |                     | Outdoor pool |
| Length                           | ft                  | 26           |
| Width                            | ft                  | 13           |
| Energy from/to the system [Quse] | kBtu                | 57,106.6     |

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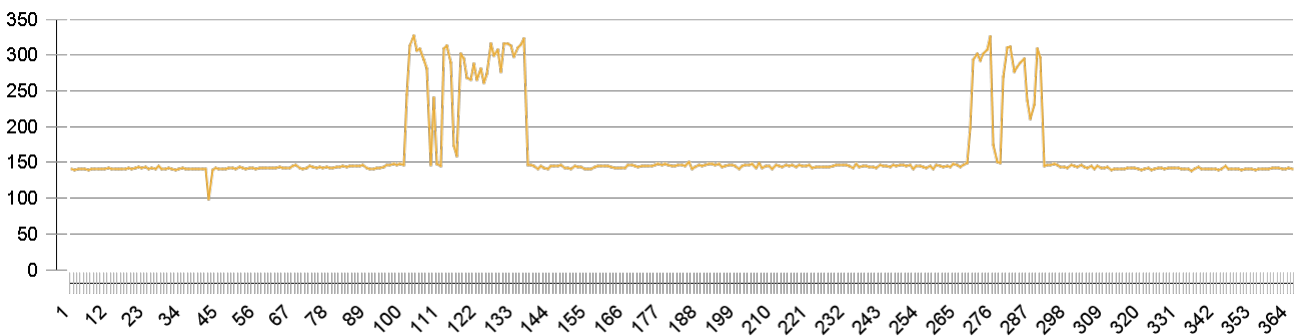
Solar thermal energy to the system [Qsol]

kBtu



## Collector North America

Daily maximum temperature [ °F]



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## Pool

Temperature [ °F] - Daily average

