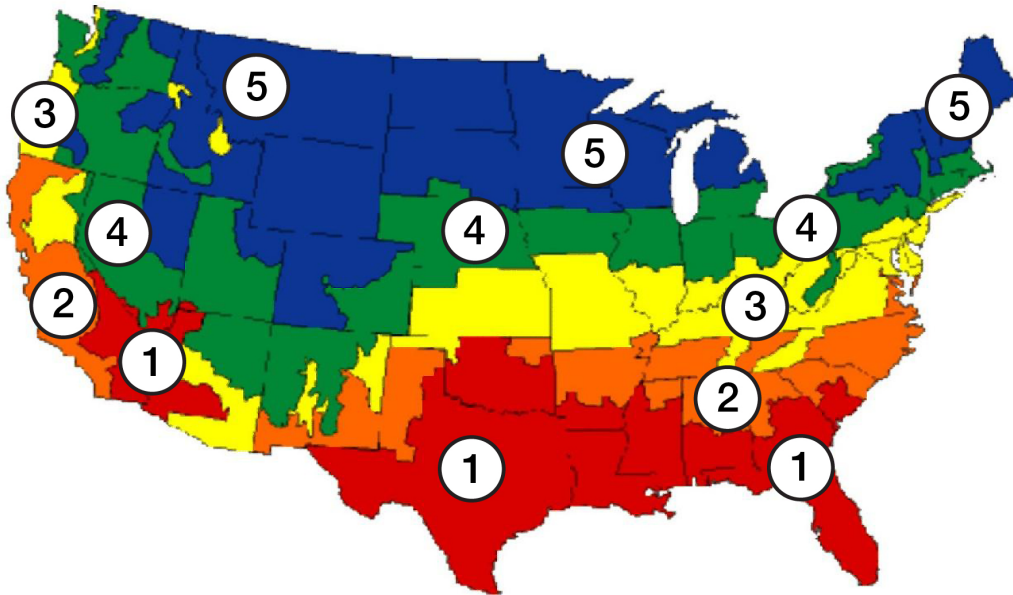


**SOLAR**  
INFRA SYSTEMS

**FUEL TYPE: ELECTRICITY**



| HEATING SQUARE FOOTAGE RANGE by CLIMATE ZONE |                                |                                |                                |                                |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| <b>1</b>                                     | <b>2</b>                       | <b>3</b>                       | <b>4</b>                       | <b>5</b>                       |
| 20-25 BTU's<br>per square foot               | 30-35 BTU's<br>per square foot | 35-40 BTU's<br>per square foot | 40-45 BTU's<br>per square foot | 45-50 BTU's<br>per square foot |

We can give you a solar heating performance estimate for your town, city or very close by. This includes most countries in the world. The following chart shows the SIS Solar Air Heater performance and savings for cities in the United States and Canada. If your city is not represented pick a city at the same latitude as yours or send us an email and we will send you back the results.

**Email:** [info@solarinfrsystems.com](mailto:info@solarinfrsystems.com)

**Please Put in Subject line:** What are my Solar Savings?

**Please provide in email:**

- Your email address
  - Your full home address (house number, street, city, (province, state, region) and country)
  - The main fuel type that you use
  - What it is costing you annually (Canadian or American dollars please)
- Briefly describe the window or area you plan on putting the solar air heater (unobstructed, southern facing, no overhanging roof)

For most international regions we use a Government of Canada/NRC CanmetENERGY developed program and NASA solar data to show the annual fuel savings for just those months which would require a heater. ([www.retscreen.net](http://www.retscreen.net))

**\* NOTE: Follow installation instructions for optimum results**

## **Heater Installation**

The SIS Solar Air Heater has been developed to easily install in a room and operate like an electric room heater. In an average installation, the solar air heater is equivalent to about a 300 to 500 watt electric space heater, depending on the area you live in. The solar heater fan circulates the room air through the staged solar collectors in the heater that heat the air flow with solar energy. The solar heater fan operates by the sunlight shining on a photovoltaic panel (PV) so, unlike a room electric space heater, there is no household electric power required. The solar air heater hangs or is placed in a south facing window and uses solar radiation to heat the room air, to make up the room heat lost through the walls, ceiling, windows, and doors.

## **Window / Location**

Make sure you have a south facing window that will take a solar air heater approximately 24 inches x 48 inches. The heater will fit between the glass and blind or curtains. There is room for venetian blinds which should be left slightly open to allow air flow through the blind louvers. Do not let the front of the heater touch the glass as it will cause a reduction in heat. If the outside temperature is zero (0°F / -17°C), the inside glass of a standard double pane window will only be about 44°F (7°C). You are also losing approximately 34 btu/hr per sq.ft. area of the window, through conduction and radiative heat loss.

Remember, if the window is low-E glass and/or argon filled, the solar radiation entering the window is filtered too low to make the solar air heater run effectively.

## **Shading**

Look out the window and see if there is shading that will block the sun. In winter the sun is low in the sky and houses or trees can block the solar energy. If you have high trees on the east and west sides of the house, these will cut off your winter morning and afternoon solar radiation (even trees that lose their leaves.) Roof overhangs and depth of the window may also cut off 2-3 hours of solar radiation in the mornings and afternoons. This can cause a reduction in the effectiveness of the solar air heater.

## **Solar Air Heater Performance Table**

The following table calculates how a solar air heater will perform in a room, with a double pane window, at a room temperature of 70°F (21°C), in a city at a specific latitude. (Important for the winter sun orientation.) If your state/province or location is not listed, pick a site closest on the same latitude as where you live. (NOTE: We are constantly adding locations. If your location is not listed, let us know.) The annual average temperature and heating months are listed for each major city. The annual heating months are used to calculate the fuel used to keep the room at the set temperature. The heating zone map will give you an idea of heating costs throughout the country. The solar air heater also uses the annual heating months, but since the sun does not shine all the time in most cities, it also factors the amount of sunny days during these heating months. Winter (65-70%) Spring and Fall (70-80%) Summer (not calculated if it is not a heating month) (80-90%).

## **Fuel Table Calculation**

The fuel table shows the latest unit price for the city and the total fuel cost to heat the room for the annual heating months. The annual fuel cost is also shown for the solar air heater that uses free solar energy and the cost of the home fuel to make up for the non-sunny days during the heating months. The difference between the normal heating fuel used with no solar and the heating fuel used with a solar air heater is the annual solar savings for the heating months.

A simple payback is calculated by dividing the manufacturer's suggested retail price with the annual cost with solar, to show the number of years it will take to pay for the cost of the solar heater, in fuel savings.

The 15 year fuel savings give you an idea of what a solar air heater can save, where energy is increasing 10% per year, inflation is 2% and a discount of 5%. (Take a look on the Electricity Table at the variation in electricity costs per kwh that is happening all over the country.)

| Table: SIS Solar Air Heater Performance for Cities in the United States and Canada |          |                    |                    |   |                        |   |                                    |   |                              |                                |  |                          |                                       |  |
|--|----------|--------------------|--------------------|---|------------------------|---|------------------------------------|---|------------------------------|--------------------------------|--|--------------------------|---------------------------------------|--|
|  |          | Fuel: Electricity  |                    |   |                        |   |                                    |   |                              |                                |  |                          |                                       |  |
| SIS Air Heater Model 50WM 2448   |          |                    |                    | MFGS Retail Price \$ 475  |                        |   |                                    |   |                              |                                |  |                          |                                       |  |
| Room Size: 15ft x 20ft (aprox 300-400 sqft)  |          |                    |                    | Notes (a) Fuel prices summer 2014 State/province Average.                                   |                        |   |                                    |   |                              |                                |  |                          |                                       |  |
| Heater Air Flow: 75 cfm (PV operated fan)  |          |                    |                    | (b) 15 year calculation includes10% fuel increase per year, 2% inflation rate, 5% discount. |                        |   |                                    |   |                              |                                |  |                          |                                       |  |
| Window: Std double pane glass  |          |                    |                    | (c) Simply payback:: number of years to recover cost of heater based on annual fuel savings |                        |   |                                    |   |                              |                                |  |                          |                                       |  |
| Solar energy reduction 30%   |          |                    |                    |   |                        |   |                                    |   |                              |                                |  |                          |                                       |  |
| Single pane window increase 25% , Low E glass reduce 60%                           |          |                    |                    |   |                        | Room Temperature 70°F (21°C)                  |                                    |   |                              |                                |  |                          |                                       |  |
| Data Calculations:   |          |                    |                    | Govt of Canada NRCCanmetENERGY program with NASA solar data (www.retscreen.net)             |                        |   |                                    |   |                              |                                |  |                          |                                       |  |
| ELECTRICITY  |          | Site Solar Data    |                    |   |                        | SIS Solar Heater                              |                                    | Solar Savings with Residential Electrical Heating |                              |                                |  |                          |                                       |  |
| City   | Latitude | Ave annual temp °F | Ave Heating Months | Double Pane Window Solar Radiation kwh/ft2/D  | Heating Zone (See Map) | Annual SIS Solar Heater Delivered Million BTU | SIS Solar Heater Ave Temp. Rise °F | Fuel Unit Cost/kwh \$(a)                          | Annual Fuel Cost no Solar \$ | Annual Fuel Cost with Solar \$ | Net Annual Fuel Savings with Solar \$(c) | Simple Payback Years (c) | 15 year Fuel Savings with Solar \$(b) |  |
| AK Anchorage   | N61.2°   | 37.4               | 12                 | 0.156   | 6                      | 3.4   | 11.8                               | \$ 0.21   | \$ 1,073                     | \$ 560                         | \$ 513                                   | 0.93                     | \$ 17,467                             |  |
| CA Los Angeles   | N33.9°   | 62.5               | 7                  | 0.322   | 2                      | 2.7   | 14.9                               | \$ 0.18   | \$ 201                       | -\$ 70                         | \$ 271                                   | 1.75                     | \$ 8,974                              |  |
| CO Denver  | N39.8°   | 50.3               | 9                  | 0.299   | 5                      | 3.5   | 15.3                               | \$ 0.13   | \$ 459                       | \$ 124                         | \$ 335                                   | 1.42                     | \$ 11,229                             |  |
| FL Maimi   | N25.7    | 75.1               | 0                  | 0.306   | 1                      | 1.8   | 13.1                               | \$ 0.12   | \$ 26                        | -\$ 56                         | \$ 82                                    | 5.79                     | \$ 2,393                              |  |
| GA Atlanta   | N33.4°   | 60.2               | 7                  | 0.284   | 2                      | 2.3   | 12.6                               | \$ 0.13   | \$ 267                       | \$ 47                          | \$ 220                                   | 2.16                     | \$ 7,197                              |  |
| HI Honolulu  | N21°     | 77                 | 0                  | 0.351   | 1                      | 2.2   | 13.9                               | \$ 0.38   | \$ 23                        | -\$ 328                        | \$ 351                                   | 1.35                     | \$ 11,816                             |  |
| ID Boise   | N43.6°   | 51.9               | 9                  | 0.288   | 4                      | 2.6   | 11.5                               | \$ 0.11   | \$ 263                       | \$ 107                         | \$ 156                                   | 3.04                     | \$ 4,987                              |  |
| IL Chicago   | N42°     | 50.2               | 8                  | 0.257   | 5                      | 2.4   | 12.3                               | \$ 0.12   | \$ 419                       | \$ 161                         | \$ 258                                   | 1.84                     | \$ 8,542                              |  |
| KA Wichita   | N37.7°   | 56.8               | 7                  | 0.296   | 3                      | 2.3   | 13                                 | \$ 0.13   | \$ 310                       | \$ 138                         | \$ 172                                   | 2.76                     | \$ 5,519                              |  |
| MA Boston  | N41.7°   | 50.6               | 10                 | 0.237   | 4                      | 2.7   | 11.1                               | \$ 0.16   | \$ 542                       | \$ 194                         | \$ 348                                   | 1.36                     | \$ 11,708                             |  |
| MN Minneapolis   | N44.9°   | 46.5               | 9                  | 0.254   | 5                      | 2.9   | 13.2                               | \$ 0.13   | \$ 557                       | \$ 212                         | \$ 345                                   | 1.38                     | \$ 11,568                             |  |
| MO St. Louis   | N38.7°   | 55.9               | 7                  | 0.263   | 3                      | 1.8   | 10.1                               | \$ 0.12   | \$ 285                       | \$ 152                         | \$ 133                                   | 3.57                     | \$ 4,187                              |  |
| MT Butte   | N46.0°   | 40                 | 12                 | 0.249   | 5                      | 3.7   | 12.5                               | \$ 0.11   | \$ 585                       | \$ 217                         | \$ 368                                   | 1.29                     | \$ 12,392                             |  |
| NM Albuquerque   | N35°     | 57.2               | 7                  | 0.362   | 4                      | 3   | 16.6                               | \$ 0.14   | \$ 257                       | \$ 47                          | \$ 210                                   | 2.26                     | \$ 6,892                              |  |
| NV Los Vegas   | N36.1°   | 68.6               | 5                  | 0.368   | 4                      | 4.1   | 17.6                               | \$ 0.13   | \$ 180                       | -\$ 78                         | \$ 258                                   | 1.84                     | \$ 8,548                              |  |
| NY New York  | N40.8°   | 54                 | 8                  | 0.257   | 3                      | 2.3   | 11.6                               | \$ 0.20   | \$ 571                       | \$ 200                         | \$ 371                                   | 1.28                     | \$ 12,490                             |  |
| OR Portland  | N45.6°   | 54                 | 10                 | 0.229   | 3                      | 2.9   | 11.8                               | \$ 0.11   | \$ 310                       | \$ 77                          | \$ 233                                   | 2.04                     | \$ 7,670                              |  |
| TX Dallas  | N36.0°   | 55.3               | 7                  | 0.322   | 1                      | 2.8   | 15.2                               | \$ 0.12   | \$ 339                       | \$ 81                          | \$ 258                                   | 1.84                     | \$ 8,534                              |  |
| VT Burlington  | N44.5°   | 46.3               | 9                  | 0.243   | 5                      | 2.7   | 12.2                               | \$ 0.18   | \$ 753                       | \$ 296                         | \$ 457                                   | 1.04                     | \$ 15,482                             |  |
| WA Seattle   | N47.5°   | 52.1               | 10                 | 0.217   | 4                      | 2.8   | 11.4                               | \$ 0.09   | \$ 274                       | \$ 83                          | \$ 191                                   | 2.49                     | \$ 6,194                              |  |
| WI Madison   | N43.1°   | 47.3               | 9                  | 0.255   | 5                      | 2.9   | 13                                 | \$ 0.15   | \$ 629                       | \$ 225                         | \$ 404                                   | 1.18                     | \$ 13,633                             |  |
| AB Edmonton  | N53.3°   | 35.9 (2.16°C)      | 12                 | 0.232   | 5                      | 3.5   | 13.2                               | \$ 0.15   | \$ 886                       | \$ 358                         | \$ 528                                   | 0.90                     | \$ 17,981                             |  |
| BC Vancouver   | N49.0°   | 49.4 (9.66°C)      | 12                 | 0.202   | 5                      | 2.6   | 9.6                                | \$ 0.11   | \$ 385                       | \$ 133                         | \$ 252                                   | 1.88                     | \$ 8,336                              |  |
| ONT Toronto  | N43.7°   | 45 ( 7.22°C)       | 10                 | 0.233   | 5                      | 2.5   | 11.2                               | \$ 0.17   | \$ 756                       | \$ 314                         | \$ 442                                   | 1.07                     | \$ 14,944                             |  |

Technology and products covered under patents USA 8,863,741, Sept 22, 2014, Canada 2,736,792 Jan 22, 2013 and world patents pending.

Contact us to learn more about our revolutionary infrared technology.

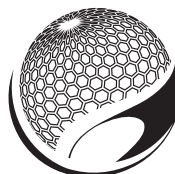
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