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Solar Thermal Collector Manufacturing Activities 2008

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Preface

The U.S. Energy Information Administration (EIA) reports detailed historical data on solar thermal collector manufacturing activities annually in its report, the *Renewable Energy Annual*. This report, *Solar Thermal Collector Manufacturing Activities*, provides an overview and tables with historical data spanning 1999-2008. These tables will correspond to similar tables to be presented in the *Renewable Energy Annual 2008* and are numbered accordingly.

Data in this report are based upon manufacturing shipment information reported on Form EIA-63A, “Annual Solar Thermal Collector Manufacturers Survey.”

Prior editions of this report may be found on the EIA website at <http://tonto.eia.doe.gov/reports/reportsD.asp?type=Renewable>.

Definitions for terms used in this report can be found in EIA’s Energy Glossary: <http://www.eia.doe.gov/glossary/index.html>.

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Solar Thermal Collector Manufacturing Activities 2008

Overview

The U.S. solar thermal industry experienced a mixed year in 2008. Despite a credit contraction and weakening in the housing market, there was some good news. Notably, a 5-megawatt (MW) Kimberlina Solar Thermal Energy Plant in Bakersfield, California was commissioned in October 2008, and a large-scale solar thermal heating and cooling system was inaugurated at the end of December 2008 in Fletcher, North Carolina. These projects utilized both Federal and State tax credits for solar thermal projects to reduce their capital costs. Many solar companies, however, were unable to get financing while awaiting news of an economic turnaround. This partly contributed to the delays or cancellations of proposed solar thermal projects, as well as companies leaving the industry, or delaying their entry.

Total shipments in 2008 increased nearly 12 percent compared to 2007. Even with this gain, total shipments were well below the 2006 record level by more than 18 percent (Figure 2.1 and Table 2.1). With the economic slowdown, it is difficult to estimate when the solar thermal industry will see significant recovery, even with the incentives included in the Emergency Economic Stabilization Act of 2008.¹ Nonetheless, with this new legislation as an incentive along with other Federal and States funding stimulants, the potential for solar thermal industry growth could eventually be substantial.

Industry Status

In 2008, there were 74 manufacturers and/or importers active in manufacturing, importing, and/or exporting solar thermal collectors, a significant increase from the 60 companies operating in 2007. These companies shipped slightly less than 17 million square feet of solar thermal collectors in 2008, compared with 15.2 million square feet in 2007 (Figure 2.1 and Table 2.1).

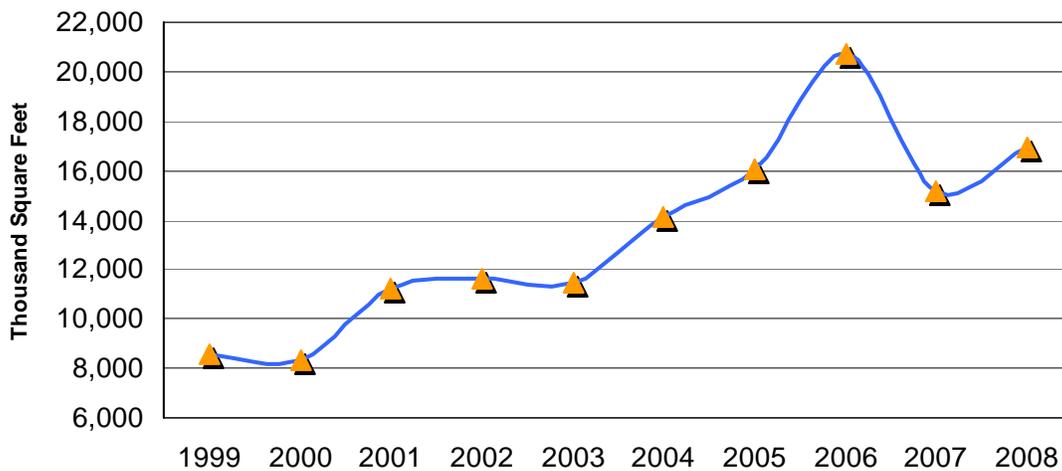
Of the 74 companies reporting solar thermal collector shipments in 2008, 70 companies also reported being involved in one or more of the following solar-related activities (Table 2.19):

- 45 companies were involved in the design of collectors or systems,
- 27 were developing prototype collectors,
- 23 were developing prototype systems,

¹ As part of the Emergency Economic Stabilization Act of 2008, the solar investment tax credit (ITC) was extended for eight years, with the following key provisions: extension of the 30% Federal investment tax credit for both residential and commercial solar installations for eight years through December 31, 2016; elimination of the \$2,000 cap on the investment tax credit for residential solar electric installations placed into service after December 31, 2008; and public utilities are now eligible to claim the solar investment tax credits. Passive solar systems and solar pool-heating systems are not eligible. The Act is available at <http://financialservices.house.gov/eesa.html>.

- 58 were involved in wholesale distribution,
- 29 were involved in retail distribution, and
- 21 were offering installation of their collectors.

Figure 2.1 Total Solar Thermal Collector Shipments, 1999-2008



Source: U.S. Energy Information Administration (EIA)
Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

In the coming year, six companies are planning to introduce new low-temperature collectors, 20 companies are planning to launch new medium-temperature collectors, and 8 companies expect to commence new high-temperature collectors (Table 2.16). The latter statistic is particularly significant, as it indicates efforts are underway to develop collectors for large-scale solar thermal energy systems such as the proposed solar thermal power plants in the U.S. southwest region.

In 2008, employment in solar-thermal-related activities totaled 1,083 person-years, a substantial 58-percent increase from the 2007 level (Table 2.18). The average employment per company was 14.6 person-years, compared with 11.4 person-years in 2007.

Forty-nine companies had 90 percent or more of their total company-wide sales revenue in solar-related products, 9 companies had 50 to 89 percent, 7 companies had 10 to 49 percent, and 9 companies had less than 10 percent (Table 2.20).

In 2008, the solar thermal industry remained highly concentrated, with the 5 largest companies accounting for 83 percent of total shipments. However, this concentration was the lowest in the past 20 years (Table 2.17). The decrease is likely due to the new start-up companies that have entered the market over the last three years.

Solar thermal collectors are divided into the categories of low-, medium-, and high-temperature collectors:

- Low-temperature collectors provide low-grade heat (less than 110 degrees Fahrenheit), through either metallic or nonmetallic absorbers and are used in such applications as swimming pool heating and low-grade water and space heating.
- Medium-temperature collectors provide medium-grade heat (greater than 110 degrees Fahrenheit, usually 140 to 180 degrees Fahrenheit), either through glazed flat-plate collectors using air or liquid as the heat transfer instrument or concentrator collectors that concentrate the heat of incident insolation to greater than “one sun,”² and are mainly used for domestic hot water heating. Evacuated-tube collectors are also included in this category.
- High-temperature collectors are parabolic dish or trough collectors designed to operate at a temperature of 180 degrees Fahrenheit or higher and are primarily used by utilities and independent power producers to generate electricity for the grid.

The solar thermal collector performance rating is an analytically-derived set of numbers representing the characteristic all-day energy output of the solar thermal collector under standard rating conditions, measured in Btu per square foot per day (Btu/ft² day). In 2008, the average solar thermal performance rating for low-temperature collectors (metallic and nonmetallic) was 1,196 Btu/ft² day, medium-temperature (air) was 864 Btu/ft² day, medium-temperature (ICS/thermosiphon) was 894 Btu/ft² day, medium-temperature (flat-plate) was 988 Btu/ft² day, medium-temperature (evacuated-tube) was 958 Btu/ft² day, medium-temperature (concentrator) was 1,173 Btu/ft² day, and high-temperature (parabolic dish/trough) was 828 Btu/ft² day (Table 2.14).

Solar Thermal Collector Shipments

Annual shipments of solar thermal collectors totaled nearly 17 million square feet in 2008, almost 12 percent above the 2007 shipments of 15.2 million square feet, but 18 percent lower than the 20.7 million square feet shipped in 2006 (Table 2.1).

In 2008, low-temperature collector shipments totaled 14 million square feet, which is 0.7 million square feet more than the shipments in 2007 (Figure 2.2 and Table 2.3). Approximately 92 percent of low-temperature collectors are used in the residential sector, with nearly all going for pool heating (Table 2.13). While the U.S. solar collector market has modestly rebounded in 2008, the solar thermal pool heating market was flat. In part,

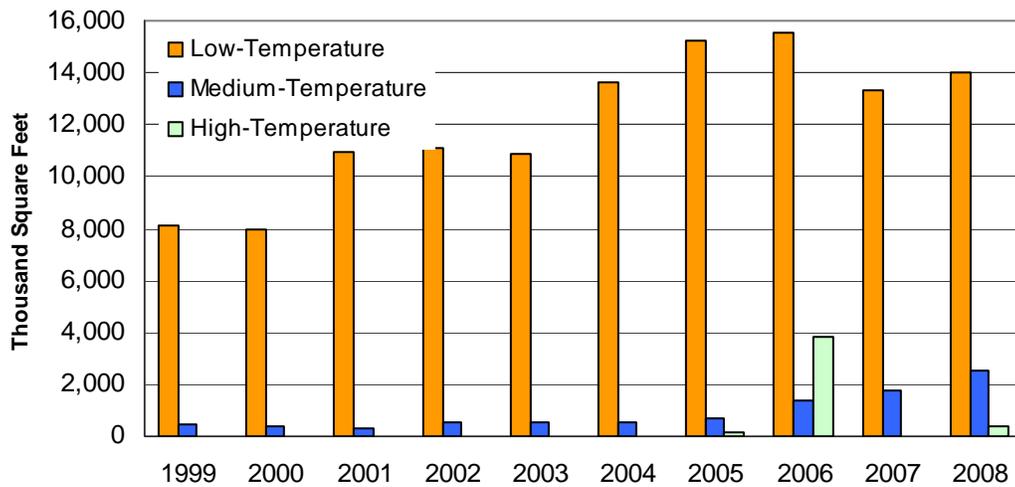
² One sun: Natural solar insolation falling on an object without concentration or diffusion of the solar rays.

this is likely due to the persistent declines in U.S. home sales and prices, and the economic downturn.

Shipments of medium-temperature collectors totaled 2.6 million square feet in 2008, 42 percent more than the shipments of 1.8 million square feet in 2007 (Figure 2.2 and Table 2.3). Approximately 81 percent of medium-temperature collectors are used for hot water heating (Table 2.13). The increase in medium-temperature collectors is believed to be mainly due to Federal tax credits and state incentives. By taking advantage of Federal tax credits and state incentives, a consumer purchasing a typical residential solar water heater costing between \$2,000 and \$3,000 can reduce associated capital costs by 30 percent or more.

High-temperature collectors shipped primarily for utility-scale concentrating solar power (CSP), totaled 388 thousand square feet, and represented more than 2 percent of total shipments in 2008. The outlook for substantial growth in high-temperature collectors is favorable. With increasing pressure to adhere to their stated renewable energy portfolio targets, U.S. utilities are looking to CSP as a way to generate renewable power on a large-scale. The California Energy Commission (CEC) is currently reviewing a number of CSP proposals that have been publicly announced or for which official declarations of intent have been made. And CEC is expecting more in the near future.

Figure 2.2 Solar Thermal Collector Shipments by Type, 1999-2008



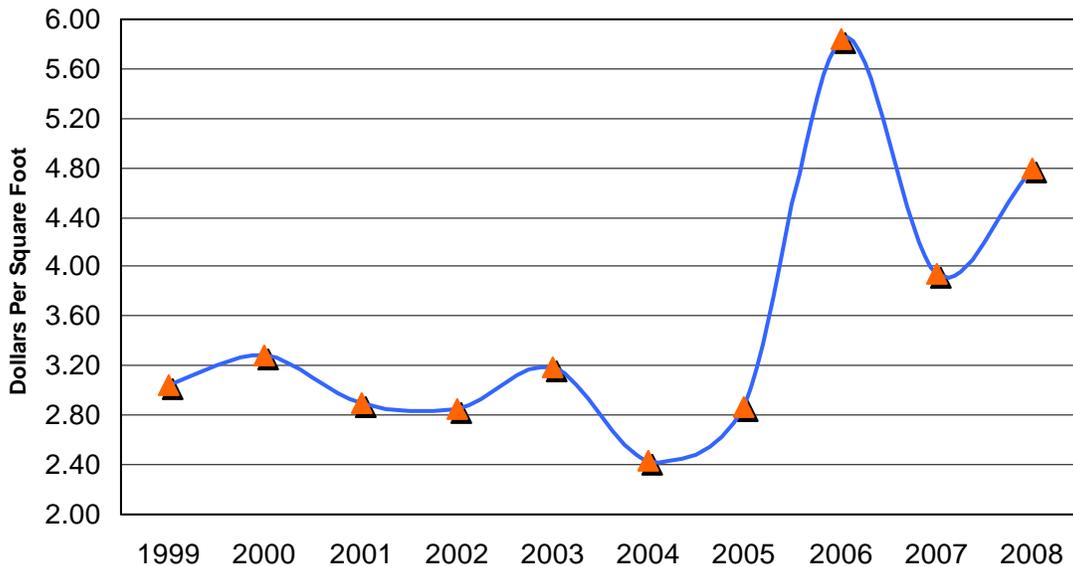
Source: U.S. Energy Information Administration (EIA)
Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Total Revenue and Average Price

The total revenue of solar thermal collector shipments was \$81.3 million in 2008, an increase of 36 percent from \$59.8 million in 2007 (Table 2.12). Revenue of low-temperature collector shipments was \$26.5 million, a less than 1-percent increase compared with the revenue of \$26.3 million in 2007. The revenue from medium- and high-temperature collector shipments was \$54.7 million, a 63-percent increase compared to \$33.5 million in 2007.

The average price for low-temperature collectors was \$1.89 per square foot in 2008, a 4-percent decrease from \$1.97 in 2007. The average price for medium- and high-temperature collectors increased more than 1 percent from \$18.33 in 2007 to \$18.57 per square foot in 2008. However, the overall average price for total shipments increased more than 21 percent, from \$3.95 per square foot in 2007 to \$4.80 per square foot in 2008 (Figure 2.3 and Table 2.12). The cause of the fluctuation was heavily influenced by custom-made collectors. These collectors are designed for limited, specialized applications, and their average prices are much higher than the conventional collectors.

Figure 2.3 Solar Thermal Collector Average Price, 1999-2008



Source: U.S. Energy Information Administration (EIA)
Form EIA-63A, "Solar Thermal Collector Manufacturers Survey."

Domestic Shipments

Domestic shipments of solar thermal collectors increased less than 7 percent from a year ago to 14.7 million square feet during 2008. Compared to the 2006 record level, the 2008 level was nearly 25 percent lower (Table 2.2). On the whole, domestic shipments of solar thermal collectors modestly rebounded to the 2005 level.

The residential sector is the largest domestic market in the United States for solar thermal collectors. Solar thermal collectors shipped to the residential sector in 2008 totaled 13 million square feet, approximately 88 percent of total domestic shipments (Table 2.13). This market sector primarily involves the use of low-temperature solar collectors for pool heating and medium-temperature solar collectors for water heating. The second largest domestic market for solar thermal collectors in 2008 was the commercial sector, which accounted for nearly 9 percent of total domestic shipments.

The largest end use for solar thermal collectors shipped in 2008 was for swimming pool heating. Pool heating accounted for 81 percent of the total domestic shipments. The second largest end use in 2008 was for domestic hot water heating, which accounted for more than 13 percent of the total domestic shipments (Table 2.13).

Nearly 59 percent of the total domestic shipments in 2008 were sent to the wholesale market, 27 percent to retail distribution, 3 percent to exporters, 6 percent to installers, and about 5 percent directly to end users (Table 2.11).

Complete Systems

Of the 74 active companies, 46 companies accounted for shipments of 63,961 complete solar thermal systems. These systems accounted for slightly more than 4 million square feet, or 24 percent of total solar thermal collectors shipped in 2008. The revenue from these solar thermal system shipments was reported as \$47.5 million (Table 2.15).

Origin of Shipments

Imports of solar thermal collectors totaled 5.5 million square feet in 2008 (Table 2.7). Almost 88 percent of all imports were low-temperature collectors (4.8 million square feet). These imports originated in ten foreign countries, and about 89 percent or 4.9 million square feet of the solar thermal collectors were imported from Israel (Table 2.8).

In 2008, 64 percent (10.9 million square feet) of all solar thermal collectors were manufactured in five states/territories: California, New Jersey, Florida, Nevada, and Puerto Rico, with 54 percent (9.1 million square feet) of the total shipped from California and New Jersey (Table 2.4).

Destination of Shipments

Export shipments totaled 2.2 million square feet in 2008. More than 2.1 million square feet, or 94 percent of total exports, were low-temperature solar thermal collectors (Table 2.9). The export market accounted for 13 percent of total shipments and was dominated by sales to Canada (36 percent), Mexico (20 percent), and Brazil (15 percent) (Table 2.10).

In 2008, 14.7 million square feet of domestic solar thermal shipments went to all 50 States, and the District of Columbia, the Virgin Islands, Guam, and Puerto Rico (Table 2.6). Nearly two-thirds were shipped to the top five destinations (states): Florida, California, Arizona, Hawaii, and Oregon. California and Florida received 53 percent of total shipments (Table 2.4 and Table 2.6). Simultaneously, there was a dramatic fluctuation of shipments in several States. This was partly influenced by the combination of the downturn in credit availability, individual State policies, and utility rebate incentive programs.

Table 2.1 Annual Shipments of Solar Thermal Collectors, 1999 - 2008

Year	Number of Companies	Collector Shipments (Thousand Square Feet)		
		Total ¹	Imports	Exports
		1999	29	8,583
2000	26	8,354	2,201	496
2001	26	11,189	3,502	840
2002	27	11,663	3,068	659
2003	26	11,444	2,986	518
2004	24	14,114	3,723	813
2005	25	16,041	4,546	1,361
2006	44	20,744	4,244	1,211
2007	60	15,153	3,891	1,376
2008	74	16,963	5,517	2,247

¹Includes shipments of solar thermal collectors to the government, including some military, but excluding space applications.

Note: Total shipments as reported by respondents include all domestic and export shipments and may include imported collectors that subsequently were shipped to domestic or foreign customers.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.2 Annual Solar Thermal Collector Domestic Shipments, 1999 - 2008

(Thousand Square Feet)

Year	Solar Thermal Collectors¹
1999	8,046
2000	7,857
2001	10,349
2002	11,004
2003	10,926
2004	13,301
2005	14,680
2006	19,532
2007	13,777
2008	14,716
U.S. Total	124,190

¹Total shipments minus export shipments.

Notes: Totals may not equal sum of components due to independent rounding.

Total shipments include those made in or shipped to U.S. Territories.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.3 Annual Shipments of Solar Thermal Collectors by Type, 1999 - 2008

(Thousand Square Feet)

Year	Low-Temperature		Medium-Temperature		High-Temperature	Other
	Total Shipments ¹	Average per Manufacturer	Total Shipments	Average per Manufacturer	Total Shipments ²	Total Shipments ²
1999	8,152	627	427	21	4	-
2000	7,948	723	400	25	5	-
2001	10,919	1,092	268	16	2	-
2002	11,126	856	535	31	2	-
2003	10,877	906	560	33	7	-
2004	13,608	1,512	506	30	-	-
2005	15,224	1,522	702	41	115	-
2006	15,546	1,413	1,346	38	3,852	-
2007	13,323	1,025	1,797	35	33	-
2008	14,015	1,274	2,560	41	388	-

¹Includes shipments of solar thermal collectors to the government, including some military, but excluding space applications.

²For high-temperature and other collectors, average annual shipments per manufacturer are not disclosed.

- = No data reported.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.4 Shipments of Solar Thermal Collectors Ranked by Origin and Destination, 2008

Origin/Destination	2008 Shipments	
	Thousand Square Feet	Percent of U.S.Total
Origin		
Top Five States	10,933	64
California	4,933	29
New Jersey	4,211	25
Florida	1,271	7
Nevada	289	2
Puerto Rico	230	1
Other Domestic	512	3
Imported	5,517	33
U.S. Total	16,963	100
Destination		
Top Five States	11,093	65
Florida	5,175	31
California	3,746	22
Arizona	939	6
Hawaii	780	5
Oregon	452	3
Other Domestic	3,623	21
Exported	2,247	13
U.S. Total	16,963	100

Notes: Totals may not equal sum of components due to independent rounding.

U.S. total includes territories.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.5 Shipments of Solar Thermal Collectors Ranked by Origin and Destination, 2007

Origin/Destination	2007 Shipments	
	Thousand Square Feet	Percent of U.S.Total
Origin		
Top Five States	10,902	72
California	5,114	34
New Jersey	4,313	28
Florida	1,125	7
Pennsylvania	225	1
Connecticut	125	1
Other Domestic	360	2
Imported	3,891	26
U.S. Total	15,153	100
Destination		
Top Five States	9,991	66
California	4,179	28
Florida	3,933	26
Arizona	768	5
Oregon	625	4
Illinois	486	3
Other Domestic	3,786	25
Exported	1,376	9
U.S. Total	15,153	100

Notes: Totals may not equal sum of components due to independent rounding.

U.S. total includes territories.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.6 Shipments of Solar Thermal Collectors by Destination, 2007 and 2008
(Square Feet)**

Destination	2007	2008
Alabama	7,955	8,905
Alaska	103	6,529
Arizona	768,366	939,228
Arkansas	33,481	2,512
California	4,178,544	3,746,327
Colorado	79,132	88,680
Connecticut	336,456	230,978
Delaware	43,604	26,482
District of Columbia	866	80
Florida	3,933,319	5,174,765
Georgia	36,285	64,518
Guam	948	512
Hawaii	447,950	780,394
Idaho	10,805	10,460
Illinois	485,952	397,234
Indiana	34,601	16,099
Iowa	11,489	7,656
Kansas	10,755	8,553
Kentucky	10,424	28,588
Louisiana	38,631	12,189
Maine	35,350	60,451
Maryland	26,738	27,773
Massachusetts	113,176	108,554
Michigan	261,395	48,915
Minnesota	37,684	137,897
Mississippi	6,426	4,759
Missouri	13,183	6,053
Montana	1,094	8,452
Nebraska	13,013	6,772
Nevada	300,666	233,456
New Hampshire	23,918	29,232
New Jersey	448,696	230,584
New Mexico	37,911	54,751
New York	425,428	411,268
North Carolina	52,557	136,015
North Dakota	444	1,242
Ohio	28,835	85,475
Oklahoma	8,248	7,869
Oregon	625,279	452,032
Pennsylvania	253,185	232,063
Puerto Rico	104,292	276,346
Rhode Island	14,179	23,106
South Carolina	15,779	18,913
South Dakota	792	1,282
Tennessee	9,144	7,278
Texas	59,816	90,077
Utah	18,675	17,039
Vermont	26,339	66,685
Virgin Islands of the U.S.	3,848	8,745
Virginia	248,267	213,860
Washington	12,497	26,304
West Virginia	13,027	11,786
Wisconsin	67,509	119,242
Wyoming	120	716
Shipments to United States/Territories	13,777,176	14,715,681
Exported	1,375,779	2,247,116
Total Shipments	15,152,955	16,962,797

**Table 2.6 Shipments of Solar Thermal Collectors by Destination, 2007 and 2008
(Square Feet) (Continued)**

Destination	2007	2008
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Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.7 Import Shipments of Solar Thermal Collectors by Type, 1999 - 2008
(Thousand Square Feet)

Year	Type				Total
	Low-Temperature	Medium-Temperature	High-Temperature	Other	
1999	2,350	2	-	-	2,352
2000	2,188	10	2	-	2,201
2001	3,500	2	-	-	3,502
2002	3,066	2	-	-	3,068
2003	2,984	2	-	-	2,986
2004	3,702	21	-	-	3,723
2005	4,513	33	-	-	4,546
2006	3,979	265	-	-	4,244
2007	3,501	390	-	-	3,891
2008	4,831	687	-	-	5,517

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.8 Distribution of U.S. Solar Thermal Collector Imports by Country, 2007 and 2008
(Square Feet)**

Region/Country	2007	2008	Percent of U.S. Imports 2008
Asia			
China	98,176	318,123	5.77
Israel	3,655,012	4,904,128	88.89
Total	3,753,188	5,222,251	94.65
Australia & Oceania			
Australia	33,000	44,814	0.81
Total	33,000	44,814	0.81
Europe			
Austria	-	5,132	0.09
Federal Republic of Germany	84,339	91,670	1.66
France	-	32,180	0.58
Portugal	-	729	0.01
Turkey	3,444	36,882	0.67
United Kingdom	5,664	33,286	0.60
Total	93,447	199,879	3.62
North America			
Canada	11,190	50,347	0.91
Total	11,190	50,347	0.91
U.S. Total	3,890,825	5,517,291	100.00

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.9 Export Shipments of Solar Thermal Collectors by Type, 1999 - 2008
(Thousand Square Feet)

Year	Type				Total
	Low-Temperature	Medium-Temperature	High-Temperature	Other	
1999	491	45	-	-	537
2000	486	10	s	-	496
2001	827	13	-	-	840
2002	654	3	2	-	659
2003	510	5	2	-	518
2004	809	4	-	-	813
2005	1,349	10	2	-	1,361
2006	1,169	42	-	-	1,211
2007	1,338	33	5	-	1,376
2008	2,115	128	4	-	2,247

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.10 Distribution of U.S. Solar Thermal Collector Exports by Country, 2007 and 2008
(Square Feet)**

Region/Country	2007	2008	Percent of U.S. Exports 2008
Africa			
Morocco	22,648	4,755	0.21
Nigeria	400	333	0.01
South Africa	42	-	-
Tunisia	139	-	-
Total	23,229	5,088	0.23
Asia			
China	3,000	-	-
Israel	-	5,756	0.26
Japan	2,000	-	-
Saudi Arabia	3,532	51,951	2.31
United Arab Emirates	-	4,412	0.20
Vietnam	-	2,640	0.12
Total	8,532	64,759	2.88
Australia & Oceania			
Australia	89,005	81,980	3.65
New Zealand	14,906	11,915	0.53
Total	103,911	93,895	4.18
Central America			
Antigua and Barbuda	1,188	224	*
Aruba	248	32	*
Bahamas	2,349	648	0.03
Barbados	1,981	-	-
Belize	-	170	*
Bermuda	266	787	0.04
British Virgin Islands	-	8,228	0.37
Cayman Islands	-	3,496	0.16
Costa Rica	9,678	17,394	0.77
Guatemala	12,064	9,625	0.43
Honduras	1,723	3,233	0.14
Jamaica	1,528	5,742	0.26
Mexico	274,326	459,181	20.43
Netherlands Antilles	1,993	1,477	0.07
Panama	-	128	*
Trinidad and Tobago	5,236	10,819	0.48
Total	312,580	521,184	23.19
Europe			
Belgium	-	11,270	0.50
Cyprus	-	240	0.01
Czech Republic	13,200	23,379	1.04
Federal Republic of Germany	288	71,254	3.17
France	38,944	150,509	6.70
Italy	15,509	-	-
Malta	-	1,344	0.06
Portugal	9,400	240	0.01
Romania	176	8,157	0.36
Russia	1,080	900	0.04
Spain	-	73,283	3.26
Sweden	53,334	22,230	0.99
Switzerland	-	6,065	0.27
Ukraine	-	40	*
United Kingdom	19,558	485	0.02
Total	151,489	369,396	16.44
North America			
Canada	512,889	804,969	35.82
Total	512,889	804,969	35.82
South America			

Table 2.10 Distribution of U.S. Solar Thermal Collector Exports by Country, 2007 and 2008 (Square Feet) (Continued)

Region/Country	2007	2008	Percent of U.S. Exports 2008
Argentina	3,115	5,616	0.25
Bolivia	-	19,032	0.85
Brazil	253,038	331,518	14.75
Chile	36	11,249	0.50
Colombia	-	3,596	0.16
Ecuador	3,960	1,478	0.07
Peru	3,000	15,336	0.68
Total	263,149	387,825	17.26
U.S. Total	1,375,779	2,247,116	100.00

* = Less than 0.01 percent.

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.11 Distribution of Domestic Solar Thermal Collector Shipments by Customer Type, 2007 and 2008
(Thousand Square Feet)**

Customer Type	Shipments	
	2007	2008
Wholesale Distributors	7,727	8,680
Retail Distributors	4,493	3,997
Exporters	464	368
Installers	872	948
End Users	221	723
U.S. Total	13,777	14,716

Notes: Totals may not equal sum of components due to independent rounding.

U.S. total includes territories.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.12 Solar Thermal Collector Shipments by Type, Quantity, Revenue, and Average Price, 2007 and 2008

Type	2007			2008		
	Quantity (Thousand Square Feet)	Revenue (Thousand Dollars)	Average Price (Dollars per Square Feet)	Quantity (Thousand Square Feet)	Revenue (Thousand Dollars)	Average Price (Dollars per Square Feet)
Low-Temperature						
Liquid/Air	13,323	26,276	1.97	14,015	26,518	1.89
Medium/High-Temperature	1,829	33,539	18.33	2,948	54,749	18.57
Medium						
Air	15	W	W	28	W	W
Liquid						
ICS/Thermosiphon	231	5,598	24.27	321	6,631	20.66
Flat Plate	1,304	21,915	16.80	1,842	32,043	17.40
Evacuated Tube	243	4,210	17.36	351	9,009	25.69
Concentrator	5	W	W	19	W	W
High-Temperature						
Parabolic Dish/Trough	33	W	W	388	4,640	11.96
Other	-	-	-	-	-	-
U.S. Total	15,153	59,815	3.95	16,963	81,348	4.80

W = Data withheld to avoid disclosure of proprietary company data.

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.13 Domestic Shipments of Solar Thermal Collectors by Market Sector, End Use, and Type, 2007 and 2008

(Thousand Square Feet)

Type	Low-Temperature	Medium-Temperature				High-Temperature	Other	2008 Total	2007 Total
	Liquid/Air	Air	Liquid			Parabolic Dish/Trough			
	Metallic and Nonmetallic		ICS/Thermosiphon	Flat-Plate (Pumped)	Evacuated Tube				
Market Sector									
Residential	10,983	26	303	1,449	239	-	-	13,000	12,799
Commercial	918	2	10	264	88	13	-	1,294	931
Industrial	-	-	-	30	3	-	95	128	46
Electric Power	-	-	-	-	-	6	289	294	1
Transportation	-	-	-	-	-	-	-	-	-
U.S. Total	11,900	28	312	1,743	330	19	383	14,716	13,777
End Use									
Pool Heating	11,880	-	-	91	2	-	-	11,973	12,076
Hot Water	8	3	312	1,426	229	-	-	1,978	1,393
Space Heating	10	24	-	131	21	-	-	186	189
Space Cooling	-	-	-	10	8	-	-	18	13
Combined Space and Water Heating	2	-	-	70	71	-	5	148	73
Process Heating	-	-	-	15	-	7	29	50	27
Electricity Generation	-	-	-	-	-	12	349	361	6
U.S. Total	11,900	28	312	1,743	330	19	383	14,716	13,777

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Table 2.14 Average Thermal Performance Rating of Solar Thermal Collectors by Type Shipped in 2008
(Btu per square foot per day)**

Year	Type							
	Low-Temperature	Medium-Temperature					High-Temperature	Other
	Liquid/Air	Air	Liquid				Parabolic Dish/Trough	
	Metallic and Nonmetallic		ICS/Thermosiphon	Flat-Plate (Pumped)	Evacuated Tube	Concentrator		
2008	1,196		864	894	988	958		

- = No data reported.

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.15 Shipments of Complete Solar Thermal Collector Systems, 2007 and 2008

Shipment Information	2007	2008
Complete Collector Systems		
Shipped	59,914	63,961
Thousand Square Feet	3,773	4,058
Percent of Total Shipments	25	24
Number of Companies	34	46
Revenue of Systems (Thousand Dollars)	30,019	47,523

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.16 Number of Companies Expecting to Introduce New Solar Thermal Collector Products in 2009

New Product Type	Number of Companies
Low-Temperature Collectors	6
Medium-Temperature Collectors	20
High-Temperature Collectors	8
Noncollector Components	16

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.17 Percent of Solar Thermal Collector Shipments by the 10 Largest Companies, 1999 - 2008

Year	Company Rank	Shipments (Thousand Square Feet)	Percent of Total Shipments
1999	1-5	7,813	91
	6-10	563	7
2000	1-5	7,521	90
	6-10	567	7
2001	1-5	10,732	96
	6-10	325	3
2002	1-5	10,755	92
	6-10	670	6
2003	1-5	10,485	92
	6-10	700	6
2004	1-5	13,291	94
	6-10	664	5
2005	1-5	14,801	92
	6-10	934	6
2006	1-5	18,535	89
	6-10	1,484	7
2007	1-5	13,015	86
	6-10	1,202	8
2008	1-5	14,023	83
	6-10	1,453	9

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.18 Employment in the Solar Thermal Collector Industry, 1999 - 2008

Year	Person- Years
1999	288
2000	284
2001	256
2002	356
2003	287
2004	317
2005	353
2006	1,069
2007	686
2008	1,083

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.19 Companies Involved in Solar Thermal Collector Related Activities by Type, 2007 and 2008

Type of Activity	2007	2008
Collector or System Design	37	45
Prototype Collector Development	23	27
Prototype System Development	22	23
Wholesale Distribution	49	58
Retail Distribution	24	29
Installation	16	21
Noncollector System Component Manufacture	18	26

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.20 Solar-Related Sales as a Percentage of Total Company Sales Revenue, 2007 and 2008

Percent of Total Sales Revenue	Number of Companies	
	2007	2008
90-100	36	49
50-89	9	9
10-49	8	7
Less than 10	7	9
U.S. Total	60	74

Source: U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."