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Solar Thermal Collector Manufacturing Activities 2007

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Energy Information Administration
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Contacts

This report was prepared by the staff of the Survey Operations Team, Coal, Nuclear, and Renewables Division, Office of Coal, Nuclear, Electric and Alternate Fuels. Questions about the preparation and content of this report may be directed to Fred Mayes, Senior Technical Advisor at e-mail fred.mayes@eia.doe.gov, (202) 586-1508 or Peter Wong, at e-mail peter.wong@eia.doe.gov, (202) 586-7574.

Preface

The 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 1998-2007, as well as the revised methodology used to collect information from all manufacturers of renewable energy equipment for 2007, so that the methodology across EIA is uniform. Changes included adding "Average Thermal Performance Rating of Collector," and collecting "Domestic Shipments by Sector, End Use, and Customer Type" instead of "Total Shipments by Sector, End Use, and Customer Type." All tables will correspond to similar tables to be presented in *Renewable Energy Annual 2007* and are numbered accordingly.

Data in this report is 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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Overview

After 3 years of rapid growth, solar thermal collector shipments reported to EIA declined substantially in 2007 (Figure 2.1). Growth during 2003-2006 was largely due to the rise in energy prices, concerns about global warming and dependence on foreign sources for oil, and the Tax Relief and Health Care Act of 2006, H.R. 6111. This Act extended the solar investment tax credit for one additional year through December 31, 2008.[1] Simultaneously however, many foreign solar companies have been eyeing U.S. solar thermal market investment opportunities. They believe that the U.S. solar thermal market is poised to take off, especially utility-scale solar thermal power and domestic solar water heating. As a result, these companies began seriously competing for the U.S. solar thermal market in 2007. This is likely a factor in the slowdown in the U.S. solar thermal collector market experienced in 2007, and it is not yet clear whether this is the beginning of a general decline or merely a brief interruption in a long-term upward trend.

Industry Status

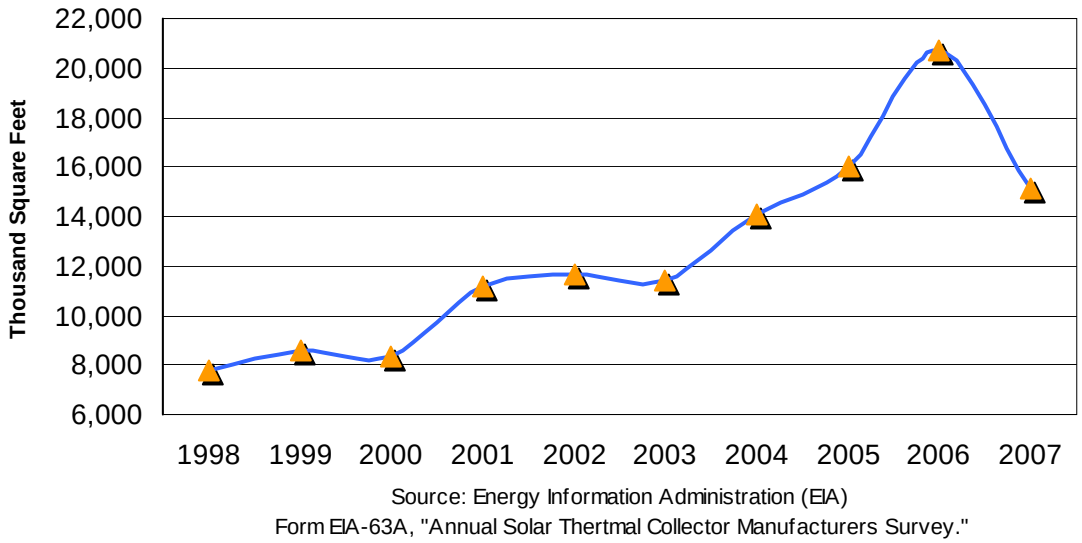
In 2007, there were 60 manufacturers and/or importers active in manufacturing, importing, and/or exporting solar thermal collectors, a significant increase from the 44 companies operating in 2006. These companies shipped 15.2 million square feet of solar thermal collectors in 2007, compared with 20.7 million square feet in 2006 (Figure 2.1 and Table 2.1).

The 60 companies reporting solar thermal collector shipments in 2007 also reported being involved in one or more of the following solar-related activities:

- 37 companies were involved in the design of collectors or systems,
- 23 were developing prototype collectors,
- 22 were developing prototype systems,
- 49 were involved in wholesale distribution,
- 24 were involved in retail distribution, and
- 16 were offering installation of their collectors (Table 2.19).

[1] The Energy Policy Act of 2005 established tax credits to homes and businesses that install solar thermal systems (The tax credit does not apply to solar water heating for swimming pools or hot tubs). Initially scheduled to expire on December 31, 2007, they were extended through December 31, 2008, by Section 206 of the Tax Relief and Health Care Act of 2006 (H.R. 6111)

Figure 2.1 Total Solar Thermal Collector Shipments, 1998-2007



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

Of the 60 companies active in 2007, nine are planning to introduce new low-temperature collectors, 17 are planning new medium-temperature collectors, and 10 expect to introduce new high-temperature collectors in 2008 (Table 2.16). This latter statistic is particularly significant, as it indicates efforts are underway to develop collectors for utility-scale power.

In 2007, employment in solar-thermal-related activities decreased by 383 person-years to 686 person-years, a 36 percent drop from the 2006 employment level. The decrease was largely attributable to the completion of the Nevada Solar One project, the first concentrated solar power facility built in the United States in more than 15 years (Table 2.18).

Thirty-six companies had 90 percent or more of their total company-wide sales revenue in solar collectors, 9 companies had 50 to 89 percent, 8 companies had 10 to 49 percent, and 7 companies had less than 10 percent (Table 2.20).

In 2007, the solar thermal industry remained highly concentrated, with the 5 largest companies accounting for 86 percent of total shipments. However, this concentration was the lowest since 1998 (Table 2.17). The drop is likely due to new firms developing new products for utility scale power plants.

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-to-high 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," and are mainly used for domestic hot water heating.[2] 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 measures in Btu per square foot per day (Btu/ft^2 day). In 2007, the average solar thermal performance rating for low-temperature collectors (metallic and nonmetallic) was 1,248 Btu/ft^2 day, medium-temperature (air) was 918 Btu/ft^2 day, medium-temperature (thermosiphon) was 926 Btu/ft^2 day, medium-temperature (flat-plate) was 979 Btu/ft^2 day, medium-temperature (evacuated-tube) was 851 Btu/ft^2 day, medium-temperature (concentrator) was 2,150 Btu/ft^2 day, and high-temperature (parabolic dish/trough) was 1,000 Btu/ft^2 day (Table 2.14).

Solar Thermal Collector Shipments

Annual shipments of solar thermal collectors totaled 15.2 million square feet in 2007, more than a 27-percent decrease from the 2006 shipments of 20.7 million square feet, and lower than the 16.0 million square feet shipped in 2005 (Table 2.1).

In 2007, low-temperature collector shipments totaled 13.3 million square feet, which is 2.2 million square feet less than low-temperature collector shipments in 2006 (Figure 2.2 and Table 2.3). Approximately 99 percent of low-temperature collectors are used for residential solar thermal pool heating (Table 2.13). Several solar thermal pool heating manufacturers described the 2007 solar swimming pool heating market as flat, slow, or even declining due to the poor economy. While the effect of the economy and the housing slowdown on the low-temperature market is not yet clear, the future of residential solar thermal pool heating sales is a matter of concern for manufacturers.

Shipments of medium-temperature collectors totaled slightly less than 1.8 million square feet in 2007, a 34-percent increase from the 2006 shipments of 1.3 million square feet in 2006 (Figure 2.2 and Table 2.3). Approximately 80 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 the Federal tax credits and state

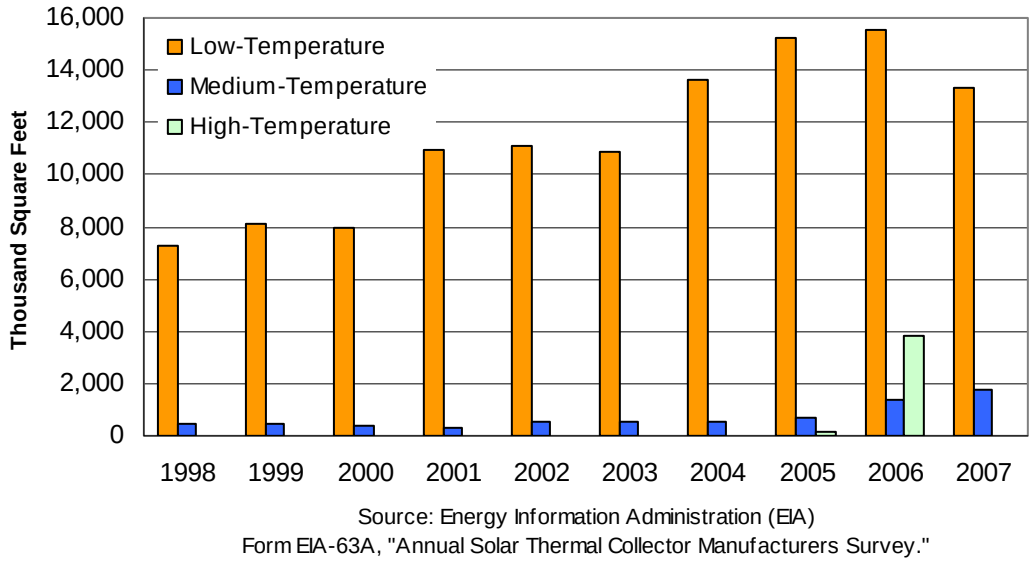
[2] One sun: Natural solar insolation falling on an object without concentration or diffusion of the solar rays

incentives. A typical residential solar water heater costs between $2,000 and $3,000. Taking advantage of the Federal tax credits and state incentives can reduce solar hot water heater capital costs by at least 30 percent.

In 2007, there was an enormous decline in high-temperature collectors shipments to 33 thousand square feet (Figure 2.2 and Table 2.3), highlighted by a substantial decline in parabolic dish/troughs used by electric utilities and independent power producers to generate electricity for the grid. Overall, shipments have declined by more than 99 percent compared with the 2006 level. The decrease was entirely caused by the completion of the Nevada Solar One project.

In contrast to the market during 2007 when no solar thermal power plants were started, a handful of commitments to build concentrating solar power (CSP) plants were announced during 2007.[3] The wave of announced plans to build new large solar power facilities throughout the United States seems to indicate that relatively large-scale systems could become more common. As of July 2008, the Federal Bureau of Land Management has processed 125 applications for future potential solar development on public lands and will continue to accept applications.[4]

Figure 2.2 Solar Thermal Collector Shipments by Type, 1998-2007



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

[3] See page 23 to 26 EIA Renewable Energy Trends in Consumption and Electricity (Issue in Focus: Central Station Solar Thermal Electricity) for an overview of the completed and proposed CSP projects released July, 2008

[4] In response to public interest in solar energy development, the Bureau of Land Management has announced plans to continue accepting applications for future potential solar development on public lands.

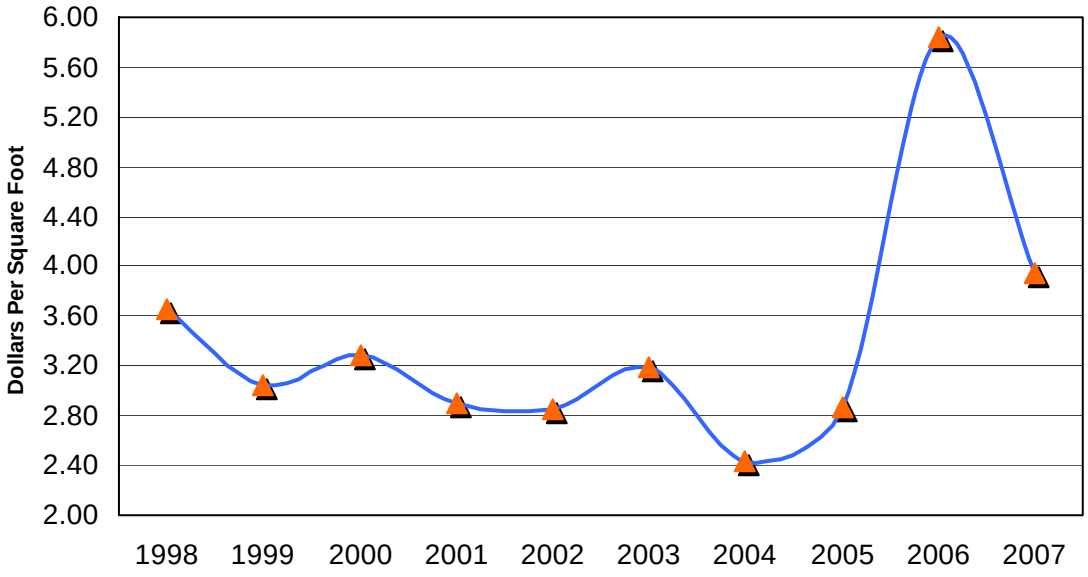
Total Revenue and Average Price

Sluggish shipments adversely affected revenue. The total revenue of solar thermal collector shipments was $ 59.8 million in 2007 (Table 2.12). This was an almost 51 percent decrease, compared with the revenue of total shipments in 2006, caused by the sharp drop in high-temperature collector shipments.

Revenue of low-temperature collector shipments was $26.3 million, a decrease of 13 percent, compared with the revenue in 2006. This was the lowest revenue received for low-temperature solar thermal collectors since 2003. The revenue from medium- and high-temperature collector shipments was $33.5 million, a 63-percent decrease compared to $90.8 million in 2006.

The average price for low-temperature collectors was $1.97 per square foot in 2007, virtually unchanged from $1.95 in 2006. The average price for medium- and high-temperature collectors increased from $17.47 to $18.33 per square foot. However, the overall average price for total shipments decreased more than 32 percent, from $5.84 per square foot in 2006 to $3.95 per square foot in 2007 (Figure 2.3 and Table 2.12). The cause of the fluctuation was heavily influenced by custom-made collectors, which are high-temperature 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, 1998-2007



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

Domestic Shipments

Corresponding to the decrease in total shipments, domestic shipments of solar thermal collectors plunged more than 29 percent to 13.8 million square year during 2007 (Table 2.2). On the whole, total and domestic shipments of solar thermal collectors fell back to the 2004 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 2007 totaled 12.8 million square feet, approximately 93 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 2007 was the commercial sector, which accounted for 7 percent of total domestic shipments.

The largest end use for solar thermal collectors shipped in 2007 was for swimming pool heating. Pool heating accounted for 88 percent of the total domestic shipments. The second-largest end use in 2007 was for domestic hot water heating, which accounted for 10 percent of the total domestic shipments (Table 2.13).

More than half (56 percent) of the total domestic shipments in 2007 were sent to the wholesale market, 33 percent to retail distribution, 3 percent to exporters, 6 percent to installers, and about 2 percent directly to end-users (Table 2.11).

Complete Systems

Of the 60 active companies, 34 companies accounted for shipments of 59,914 complete solar thermal systems. These systems accounted for 3.8 million square feet, or 25 percent of total solar thermal collectors shipped in 2007. The revenue value from these solar thermal system shipments was reported as $30 million (Table 2.15).

Origin of Shipments

Imports of solar thermal collectors totaled 3.9 million square feet in 2007 (Table 2.7). Almost 90 percent of all imports were low-temperature collectors (3.5 million square feet). These imports originated in seven foreign countries, and about 3.7 million square feet of the solar thermal collectors were imported from Israel (Table 2.7 and Table 2.8).

In 2007, 72 percent (10.9 million square feet) of all solar thermal collectors were manufactured in five states: California, New Jersey, Florida, Pennsylvania, and Connecticut, with 62 percent (9.4 million square feet) of the total shipped from California and New Jersey (Table 2.4 and Table 2.6).

Destination of Shipments

Export shipments totaled 1.4 million square feet in 2007. More than 1.3 million square feet, or 97 percent of total exports, were low-temperature solar thermal collectors (Table 2.9). The export market accounted for 9 percent of total shipments and was dominated by sales to Canada (37 percent of exports), Mexico (20 percent), and Brazil (18 percent) (Table 2.10).

In 2007, 13.8 million square feet of domestic solar thermal shipments went to all 50 States within the U.S., together with the District of Columbia, the Virgin Islands, Guam, and Puerto Rico (Table 2.6). Over two-thirds were shipped to the top five destinations (states): California, Florida, Arizona, Oregon, and Illinois. California and Florida received nearly 54 percent of total shipments (Table 2.4 and Table 2.6). Notably, there was a dramatic decrease in shipments to several states in 2007, including Alabama, California, Florida, Nevada, New York, and North Carolina. This mainly was caused by the sharp decrease in demand as reported by a number of companies.

Table 2.1 Annual Shipments of Solar Thermal Collectors, 1998 - 2007

(Thousand Square Feet)

Year	Number of Companies	Collector Shipments		
		Total[1]	Imports	Exports
1998	28	7,756	2,206	360
1999	29	8,583	2,352	537
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

[1]Includes 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: Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.2 Annual Solar Thermal Collector Domestic Shipments, 1998 - 2007

(Thousand Square Feet)

Year	Solar Thermal Collectors[1]
1998	7,396
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
U.S. Total	**116,870**

[1]Total 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: Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.3 Annual Shipments of Solar Thermal Collectors by Type, 1998 - 2007

(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]
1998	7,292	607	443	23	21	-
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	-

[1]Includes shipments of solar thermal collectors to the government, including some military, but excluding space applications.
[2]For high-temperature and other collectors, average annual shipments per manufacturer are not disclosed.
- = No data reported.
Source: 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, 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: 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, 2006

Origin/Destination	2006 Shipments	
	Thousand Square Feet	Percent of U.S.Total
Origin		
Top Five States	16,225	78
New Jersey	5,606	27
California	5,442	26
Nevada	3,845	19
Florida	1,041	5
Tennessee	290	1
Other Domestic	275	1
Imported	4,244	20
U.S. Total	**20,744**	**100**
Destination		
Top Five States	15,054	73
Florida	4,841	23
California	4,610	22
Nevada	4,215	20
Arizona	780	4
New York	607	3
Other Domestic	4,479	22
Exported	1,211	6
U.S. Total	**20,744**	**100**

Notes: Totals may not equal sum of components due to independent rounding.
U.S. total includes territories.
Source: Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.6 Shipments of Solar Thermal Collectors by Destination, 2006 and 2007
(Square Feet)

Destination	2006	2007
Alabama	55,330	7,955
Alaska	75	103
Arizona	780,175	768,366
Arkansas	66,359	33,481
California	4,609,807	4,178,544
Colorado	93,347	79,132
Connecticut	382,215	336,456
Delaware	1,203	43,604
District of Columbia	159	866
Florida	4,841,469	3,933,319
Georgia	50,750	36,285
Guam	-	948
Hawaii	434,650	447,950
Idaho	17,867	10,805
Illinois	521,528	485,952
Indiana	54,074	34,601
Iowa	21,152	11,489
Kansas	19,590	10,755
Kentucky	17,858	10,424
Louisiana	24,226	38,631
Maine	57,774	35,350
Maryland	26,557	26,738
Massachusetts	90,741	113,176
Michigan	260,001	261,395
Minnesota	37,929	37,684
Mississippi	560	6,426
Missouri	20,314	13,183
Montana	762	1,094
Nebraska	17,985	13,013
Nevada	4,215,471	300,666
New Hampshire	25,633	23,918
New Jersey	583,468	448,696
New Mexico	39,207	37,911
New York	606,613	425,428
North Carolina	171,552	52,557
North Dakota	3,394	444
Ohio	45,246	28,835
Oklahoma	13,305	8,248
Oregon	505,860	625,279
Pennsylvania	266,645	253,185
Puerto Rico	109,666	104,292
Rhode Island	16,413	14,179
South Carolina	2,729	15,779
South Dakota	1,504	792
Tennessee	2,921	9,144
Texas	51,559	59,816
Utah	8,460	18,675
Vermont	26,287	26,339
Virgin Islands of the U.S.	2,431	3,848
Virginia	240,857	248,267
Washington	5,491	12,497
West Virginia	14,529	13,027

Table 2.6 Shipments of Solar Thermal Collectors by Destination, 2006 and 2007 (Square Feet) (Continued)

Destination	2006	2007
Wisconsin	67,238	67,509
Wyoming	1,468	120
Shipments to United States/Territories	19,532,404	13,777,176
Exported	1,211,241	1,375,779
Total Shipments	**20,743,645**	**15,152,955**

- = No data reported.

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

Table 2.7 Import Shipments of Solar Thermal Collectors by Type, 1999 - 2007

(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

- = No data reported.

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

Source: 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, 2006 and 2007
(Square Feet)

Region/Country	2006	2007	Percent of U.S. Imports 2007
Asia			
China	41,964	98,176	2.52
Israel	4,122,040	3,655,012	93.94
Total	4,164,004	3,753,188	96.46
Europe			
Germany	31,689	84,339	2.17
Turkey	1,654	3,444	0.09
United Kingdom	9,633	5,664	0.15
Total	42,976	93,447	2.40
North & Central America			
Canada	-	11,190	0.29
Total	-	11,190	0.29
Oceania & Australia			
Australia	36,981	33,000	0.85
Total	36,981	33,000	0.85
U.S. Total	**4,243,961**	**3,890,825**	**100.00**

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.9 Export Shipments of Solar Thermal Collectors by Type, 1999 - 2007

(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

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: 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, 2006 and 2007
(Square Feet)

Region/Country	2006	2007	Percent of U.S. Exports 2007
Africa			
Morocco	-	22,648	1.65
Nigeria	-	400	0.03
South Africa	-	42	*
Tunisia	-	139	0.01
Total	-	23,229	1.69
Asia			
China	-	3,000	0.22
Japan	5,000	2,000	0.15
Malaysia	2,715	-	-
Saudi Arabia	-	3,532	0.26
United Arab Emirates	11,220	-	-
Total	18,935	8,532	0.62
Europe			
Belgium	21,577	-	-
Czech Republic	12,000	13,200	0.96
Denmark	3,000	-	-
France	148,541	38,944	2.83
Germany	75,000	288	0.02
Italy	15,891	15,509	1.13
Portugal	-	9,400	0.68
Romania	-	176	0.01
Russia	-	1,080	0.08
Spain	64,000	-	-
Sweden	24,894	53,334	3.88
United Kingdom	8,090	19,558	1.42
Total	372,993	151,489	11.01
North & Central America			
Antigua and Barbuda	1,900	1,188	0.09
Aruba	217	248	0.02
Bahamas	3,108	2,349	0.17
Barbados	-	1,981	0.14
Bermuda	80	266	0.02
British Virgin Islands	912	-	-
Canada	513,699	512,889	37.28
Cayman Islands	1,136	-	-
Costa Rica	8,416	9,678	0.70
Dominican Republic	1,778	-	-
Guatemala	11,144	12,064	0.88
Honduras	-	1,723	0.13
Jamaica	620	1,528	0.11
Mexico	205,117	274,326	19.94
Netherlands Antilles	170	1,993	0.14
Nicaragua	40	-	-
Panama	64	-	-
St Lucia	140	-	-
Trinidad and Tobago	434	5,236	0.38
Total	748,975	825,469	60.00
Oceania & Australia			
Australia	66,953	89,005	6.47
New Zealand	-	14,906	1.08

Table 2.10 Distribution of U.S. Solar Thermal Collector Exports by Country, 2006 and 2007 (Square Feet) (Continued)

Region/Country	2006	2007	Percent of U.S. Exports 2007
Total	66,953	103,911	7.55
South America			
Argentina	-	3,115	0.23
Bolivia	480	-	-
Brazil	-	253,038	18.39
Chile	1,775	36	*
Ecuador	1,131	3,960	0.29
Peru	-	3,000	0.22
Total	3,386	263,149	19.13
U.S. Total	**1,211,242**	**1,375,779**	**100.00**

* = Less than 0.01 percent.

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.
Source: 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, 2006 and 2007
(Thousand Square Feet)

Customer Type	Shipments	
	2006	2007
Wholesale Distribution	-	7,727
Retail Distributers	-	4,493
Exporters	-	464
Installers	-	872
End Users	-	221
U.S. Total	**-**	**13,777**

- = No data reported.
Notes: Totals may not equal sum of components due to independent rounding.
U.S. total includes territories.
Source: 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, 2006 and 2007

Type	2006			2007		
	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 and Air	15,546	30,324	1.95	13,323	26,276	1.97
Medium/High Temperature	5,198	90,792	17.47	1,829	33,539	18.33
Medium						
Air	6	W	W	15	W	W
Liquid						
ICS/Thermosiphon	238	5,793	24.34	231	5,598	24.27
Flat Plate	1,043	16,613	15.93	1,304	21,915	16.80
Evacuated Tube	55	1,422	25.71	243	4,210	17.36
Concentrator	4	W	W	5	W	W
High						
Parabolic Dish and Trough	3,852	W	W	33	W	W
Other	-	-	-	-	-	-
U.S. Total	**20,744**	**121,116**	**5.84**	**15,153**	**59,815**	**3.95**

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: 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, 2006 and 2007

(Thousand Square Feet)

Type	Low-Temperature	Medium-Temperature					High-Temperature	Other	2007 Total	2006 Total
	Liquid/Air	Air	Liquid				Parabolic Dish/Trough			
	Metallic and Nonmetallic		ICS/Thermosiphon	Flat-Plate (Pumped)	Evacuated Tube	Concentrator				
Market Sector										
Residential	11,352	13	217	1,052	166	-	-	-	12,799	-
Commercial	633	2	9	207	76	5	s	-	931	-
Industrial	-	-	-	18	-	-	27	-	46	-
Electric Power	1	-	-	-	-	-	-	-	1	-
Transportation	-	-	-	-	-	-	-	-	-	-
U.S. Total	**11,986**	**15**	**225**	**1,277**	**243**	**5**	**27**	**-**	**13,777**	**-**
End Use										
Pool Heating	11,917	-	-	158	-	-	-	-	12,076	-
Hot Water	4	-	225	951	213	-	s	-	1,393	-
Space Heating	63	15	-	99	12	-	-	-	189	-
Space Cooling	-	-	-	-	13	-	-	-	13	-
Combined Space and Water Heating	-	-	-	68	5	-	-	-	73	-
Process Heating	-	-	-	-	-	-	27	-	27	-
Electricity Generation	1	-	-	-	-	5	-	-	6	-
U.S. Total	**11,986**	**15**	**225**	**1,277**	**243**	**5**	**27**	**-**	**13,777**	**-**

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: 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 2007
(Btu/ft^{2}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		
2007	1,248	918	926	979	851	2,150	1,000	-

- = No data reported.
Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.15 Shipments of Complete Solar Thermal Collector Systems, 2006 and 2007

Shipment Information	2006	2007
Complete Collector Systems		
Shipped	79,903	59,914
Thousand Square Feet	6,587	3,773
Percent of Total Shipments	32	25
Number of Companies	29	34
Revenue of Systems (Thousand Dollars)	31,297	30,019

Source: 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 2008

New Product Type	Number of Companies
Low-Temperature Collectors	9
Medium-Temperature Collectors	17
High-Temperature Collectors	10
Noncollector Components	7

Source: 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, 1998 - 2007

Year	Company Rank	Shipments (Thousand Square Feet)	Percent of Total Shipments
1998	1-5	6,938	89
	6-10	613	8
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

Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

Table 2.18 Employment in the Solar Thermal Collector Industry, 1998 - 2007

Year	Person Years
1998	207
1999	288
2000	284
2001	256
2002	356
2003	287
2004	317
2005	353
2006	1,069
2007	686

Source: 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, 2006 and 2007

Type of Activity	2006	2007
Collector or System Design	37	37
Prototype Collector Development	19	23
Prototype System Development	19	22
Wholesale Distribution	38	49
Retail Distribution	20	24
Installation	19	16
Noncollector System Component Manufacture	19	18

Source: 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, 2006 and 2007

Percent of Total Sales Revenue	Number of Companies	
	2006	2007
90-100	27	36
50-89	7	9
10-49	4	8
Less than 10	6	7
U.S. Total	**44**	**60**

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