

WINTERGREEN RESEARCH, INC.

**Molten Salt Solar Energy Thermal Storage and  
Concentrated Solar Power (CSP) Market Shares, Strategies, and  
Forecasts, Worldwide, 2010 to 2016**

**Solar Thermal Storage Systems Provide Energy Efficiency**



*Picture by Susie Eustis*

**MOUNTAINS OF OPPORTUNITY**

***OPPORTUNITY ABOUNDS***

**WinterGreen Research, Inc.  
Lexington, Massachusetts**

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## **CHECK OUT THESE KEY TOPICS**

**Molten Salt  
Thermal Solar Energy Storage  
Concentrated Solar Power (CSP)**

**Parabolic Trough  
Parabolic Dish  
Solar Central Tower**

**Heliostats  
Heliostat Control System  
Commercial Solar Panels**

**Solar Utility  
Smart Grid**

**Solar Concentrated Power Technologies  
Solar Thermal With Molten Salt Energy Storage  
Concentrated Solar Electricity Solutions**

**Solar Energy**

**Solar Steam Generator  
Mirrors To Concentrate Sun's Energy  
Mirrors To Concentrate Solar Energy  
Solar Energy Round-Trip Efficiency**

**Climate Change  
Raise Global Sea Levels**

**Changing Water Supplies**

**Solar-Thermal Power Plant**

**Next-Generation Solar UVAC Receiver**

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## **Molten Salt Solar Energy Thermal Storage and Concentrated Solar Power (CSP) Market Shares and Forecasts, Worldwide, 2010-2016**

LEXINGTON, Massachusetts (June 7, 2010) – WinterGreen Research announces that it has a new study on Molten Salt Solar Energy Thermal Storage and Concentrated Solar Power (CSP): Market Shares and Forecasts, Worldwide, 2010-2016. The 2010 study has 309 pages, 103 tables and figures.

Large solar farms are part of the answer to implementing energy generated from capture of heat from the sun. Utility scale systems are complex implementations of aggregated capture devices. The value of utility scale build out is the sheer size of the projects.

It is easier to implement one large project in a controlled area than to implement multiple medium size project to achieve the same level of power generation.

Molten salt solar energy storage systems implement utility scale solar electricity systems. The large scale provides replacement for coal systems and supplements nuclear systems that are not feasible in many locations. Solar concentrators are able to run conventional steam generators, leveraging existing technology for renewable energy electricity use. Corrosion is an issue. The pipes that carry the molten salt need to be corrosion resistant, otherwise they need to be replaced every year. Heat is another issue. The high heat of the salt may cause chemical decomposition of the solution, creating the need to replace the solution at relatively short intervals.

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There is growing global demand for cost-effective and reliable solar power. Molten salt storage and solar electricity generation by use of steam turbines are poised to achieve significant growth. The economies of scale have not yet kicked in and will do so after 100 projects have been built out. The technology promises to be significant because the projects generate so much electricity.

Solar concentrators are efficient and leverage existing steam generation technology. The technology will succeed far faster and be far more wide spread that the vendor executives are now predicting. With rising prices of oil and the Gulf of Mexico oil well disaster, solar power begins to look good, because it is a sustainable energy source.

Aggregation of electricity generated from solar panels placed on commercial roofs is another aspect of utility scale electricity generation. The commercial roof electricity can be sold from electricity substations to the locality for use in data centers, powering electric vehicles, and general electricity usage.

Solar energy market driving forces relate to the opportunity to harness a cheap, long lasting, powerful energy source. Solar energy can be used to create electricity in huge quantity. Solar panels are mounted in a weatherproof frame, are mounted in areas with direct exposure to the sun to generate electricity from sunlight.

Solar power systems are comprised of solar modules, related power electronics, and other components. Solar panels are used in residential, commercial and industrial applications. Solar compositions of arrays that comprise electric utility grids appear to be the wave of the future.

The demand for solar energy is dependent on a lower prices for solar and higher prices for petroleum. A combination of economies of scale being realized in the manufacturing along with increases in the current prices for petroleum will drive solar energy adoption.

The overall solar market has attained enough critical mass to boost competitive technologies of thin film and monocrystalline, polycrystalline, and multicrystalline silicon based systems.

Concentrated thermal solar molten salt storage units at a level below \$100 million in 2009 are anticipated to reach \$13.6 billion by 2016. Vendors are well positioned to gain significant market share over the next five years as existing products are tuned as second and third generation products to achieve more economies of scale.

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Keywords: Molten Salt, Thermal Solar Energy Storage, Concentrated Solar Power (CSP), Parabolic Trough, Parabolic Dish, Solar Central Tower, Heliostats, Heliostat Control System, Commercial Solar Panels, Solar Utility, Smart Grid, Solar Concentrated Power Technologies, Solar Thermal With Molten Salt Energy Storage, Concentrated Solar Electricity Solutions, Solar Energy, Solar Steam Generator, Mirrors To Concentrate Suns Energy, Mirrors To Concentrate Solar Energy, Solar Energy Round-Trip Efficiency, Climate Change, Raise Global Sea Levels, Changing Water Supplies, Solar-Thermal Power Plant, Next-Generation Solar UVAC Receiver, [www.wintergreenresearch.com](http://www.wintergreenresearch.com), solar panel, solar electricity, solar market shares, solar market forecasts, solar technology, CIGS, Photovoltaic, Solar, thin film, crystalline, Substrate, Solar Modules Cadmium Telluride (CdTe) Semiconductor Material, Flexible Glass Solar Panels, Polysilicon Producers, Solar Inverter, Solar Micro Inverter, <http://wintergreenresearch.com/reports/molten salt.htm>

## **YOU MUST HAVE THIS STUDY**

### **Companies Profiled**

#### **Market Leaders**

#### **MOLTEN SALT SOLAR GENERATED ELECTRICITY STORAGE COMPANY PROFILES**

**Abengoa  
Acciona Solar Power  
Areva / Ausra  
BrightSource Energy  
GE Energy  
Siemens  
United Technologies  
Schott Solar  
Hitachi**

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## Solar Molten Salt Storage Market Participants

### Selected Company Profiles

Asahi Glass

Battelle

Corning

Directed Vapor Technology

DuPont

Applied Materials

SEIA

United Technologies / SolarReserve

United Technologies / Hamilton Sundstrand

## Molten Salt Thermal Storage and Concentrated Solar Power (CSP) Market Shares, Strategies, And Forecasts, Worldwide, 2010 to 2016

### Report Methodology

This is the 444th report in a series of primary market research reports that provide forecasts in solar energy, robots, communications, telecommunications, the Internet, computer, software, telephone equipment, health equipment, and batteries to store energy. Automated process and significant growth potential are a priorities in topic selection. The project leaders take direct responsibility for writing and preparing each report. They have significant experience preparing industry studies. Forecasts are based on primary research and proprietary data bases.

The primary research is conducted by talking to customers, distributors and companies. The survey data is not enough to make accurate assessment of market size, so WinterGreen Research looks at the value of shipments and the average price to achieve market assessments. Our track record in achieving accuracy is unsurpassed in the industry. We are known for being able to develop accurate market shares and projections. This is our specialty.

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The analyst process is concentrated on getting good market numbers. This process involves looking at the markets from several different perspectives, including vendor shipments. The interview process is an essential aspect as well. We do have a lot of granular analysis of the different shipments by vendor in the study and addenda prepared after the study was published if that is appropriate.

Forecasts reflect analysis of the market trends in the segment and related segments. Unit and dollar shipments are analyzed through consideration of dollar volume of each market participant in the segment. Installed base analysis and unit analysis is based on interviews and an information search. Market share analysis includes conversations with key customers of products, industry segment leaders, marketing directors, distributors, leading market participants, opinion leaders, and companies seeking to develop measurable market share.

Over 200 in depth interviews are conducted for each report with a broad range of key participants and industry leaders in the market segment. We establish accurate market forecasts based on economic and market conditions as a base. Use input/output ratios, flow charts, and other economic methods to quantify data. Use in-house analysts who meet stringent quality standards. Interviewing key industry participants, experts and end-users is a central part of the study. Our research includes access to large proprietary databases. Literature search includes analysis of trade publications, government reports, and corporate literature.

Findings and conclusions of this report are based on information gathered from industry sources, including manufacturers, distributors, partners, opinion leaders, and users. Interview data was combined with information gathered through an extensive review of internet and printed sources such as trade publications, trade associations, company literature, and online databases. The projections contained in this report are checked from top down and bottom up analysis to be sure there is congruence from that perspective.

The base year for analysis and projection is 2009. With 2009 and several years prior to that as a baseline, market projections were developed for 2010 through 2016. These projections are based on a combination of a consensus among the opinion leader contacts interviewed combined with understanding of the key market drivers and their impact from a historical and analytical perspective. The analytical methodologies used to generate the market estimates are based on penetration analyses, similar market analyses, and delta calculations to supplement independent and dependent variable analysis. All analyses are displaying selected descriptions of products and services.

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This research includes referencde to an ROI model that is part of a series that provides IT systems financial planners access to information that supports analysis of all the numbers that impact management of a product launch or large and complex data center. The methodology used in the models relates to having a sophisticated analytical technique for understanding the impact of workload on processor consumption and cost.

WinterGreen Research has looked at the metrics and independent research to develop assumptions that reflect the actual anticipated usage and cost of systems. Comparative analyses reflect the input of these values into models.

The variables and assumptions provided in the market research study and the ROI models are based on extensive experience in providing research to large enterprise organizations and data centers. The ROI models have lists of servers from different manufacturers, Systems z models from IBM, and labor costs by category around the world. This information has been developed from WinterGreen research proprietary data bases constructed as a result of preparing market research studies that address the software, energy, healthcare, telecommunications, and hardware businesses.

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# Molten Salt Thermal Storage and Concentrated Solar Power (CSP) Market Shares and Forecasts, Worldwide, 2010-2016

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**Molten Salt Solar Company Profiles**

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## **ABOUT THE COMPANY**

**WINTERGREEN RESEARCH**, IS ABLE TO IDENTIFYING MARKET TRENDS THROUGH PRIMARY RESEARCH TECHNIQUES. THE EMPHASIS IS ON DEVELOPING ACCURATE NUMBERS THAT INCLUDE UNDERSTANDING DEVELOPMENTS, INTERVIEWING DISTRIBUTORS AND USERS, AND INTERVIEWING OPINION LEADERS. BY READING THE ELECTRONIC EQUIVALENT OF 40 FEET OF PAPER, **WINTERGREEN RESEARCH** SENIOR ANALYSTS CAN LEARN A LOT MORE ABOUT MARKETS, A LOT FASTER THAN CAN BE LEARNED THROUGH SURVEYS AND FOCUS GROUPS THAT ARE INHERENTLY LIMITED BECAUSE THEY ARE NOT ACCURATE. THINKING ABOUT MARKET TRENDS IS A HIGH PRIORITY AT **WINTERGREEN RESEARCH**. AS WITH ALL RESEARCH, THE VALUE PROPOSITION FOR COMPETITIVE ANALYSIS COMES FROM INTELLECTUAL INPUT AND FILTERING OF INFORMATION FOR THE PURPOSE OF ACHIEVING INTEGRATION INSIGHT.

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**ABOUT THE PRINCIPAL AUTHORS**

**ELLEN T. CURTISS**, TECHNICAL DIRECTOR, CO-FOUNDER OF WINTERGREEN RESEARCH, CONDUCTS STRATEGIC AND MARKET ASSESSMENTS IN TECHNOLOGY-BASED INDUSTRIES. PREVIOUSLY SHE WAS A MEMBER OF THE STAFF OF ARTHUR D. LITTLE, INC., FOR 23 YEARS, MOST RECENTLY AS VICE PRESIDENT OF ARTHUR D. LITTLE DECISION RESOURCES, SPECIALIZING IN STRATEGIC PLANNING AND MARKET DEVELOPMENT SERVICES. SHE IS A GRADUATE OF BOSTON UNIVERSITY AND THE PROGRAM FOR MANAGEMENT DEVELOPMENT AT HARVARD GRADUATE SCHOOL OF BUSINESS ADMINISTRATION. SHE IS THE AUTHOR OF RECENT STUDIES ON WORLDWIDE TELECOMMUNICATIONS MARKETS, THE TOP TEN INTERNET EQUIPMENT COMPANIES, THE TOP TEN CONTRACT MANUFACTURING COMPANIES, AND THE TOP TEN TELECOMMUNICATIONS MARKET ANALYSIS AND FORECASTS.

**SUSAN EUSTIS**, PRESIDENT, CO-FOUNDER OF WINTERGREEN RESEARCH, HAS DONE RESEARCH IN COMMUNICATIONS AND COMPUTER MARKETS AND APPLICATIONS. SHE HOLDS SEVERAL PATENTS IN MICROCOMPUTING AND PARALLEL PROCESSING. SHE HAS THE ORIGINAL PATENTS IN ELECTRONIC VOTING MACHINES. SHE HAS NEW PATENT APPLICATIONS IN FORMAT VARYING, MULTIPROCESSING, AND ELECTRONIC VOTING. SHE IS THE AUTHOR OF RECENT STUDIES OF SOA MARKETING STRATEGIES, INTERNET EQUIPMENT, CLOUD COMPUTING, BIOMETRICS, A STUDY OF INTERNET EQUIPMENT, WORLDWIDE TELECOMMUNICATIONS EQUIPMENT, TOP TEN TELECOMMUNICATIONS, DIGITAL LOOP CARRIER, WEB HOSTING, WEB SERVICES, ENERGY MARKETS, ELECTRIC VEHICLES, THIN FILM BATTERIES, BUSINESS PROCESS MANAGEMENT, AND APPLICATION INTEGRATION MARKETS. MS. EUSTIS IS A GRADUATE OF BARNARD COLLEGE.

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