

# Concentrating Solar Power (CSP)

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## Abstracts

Concentrating Solar Power (CSP) slipped from an all-time high in production of 885 GWh in 2008 to 862 GWh in 2009. New capacity becoming operational in 2010 pushed production to 1121 GWh and an estimated 1475 GWh in 2011. The wholesale value from this technology, also known as Solar Thermal power, generated \$68 USD million in 2008, \$102 million in 2009, to \$362 million in 2010. 2011 sales should top a half billion dollars at an estimated \$545 million.

The cost of the installed base of CSP at the end of 2011 is estimated at \$9.5 billion. Of that roughly 93% of the installed base value is in parabolic trough technology. By 2015, that percentage is forecast to drop to 70% as power tower, also called central receiving station technology, becomes more common. The other two CSP technologies, linear Fresnel reflector and the Stirling engine/dish design are decidedly lacking although there are a few small projects going forward.

The seemingly smooth upward curve of CSP productions hides some facts that will impinge future growth. At least 2,250 MW of planned CSP capacity was suddenly switched to PV due to the lower installation costs of PV, among other reasons. Also hidden by the high Spanish feed-in tariff is the somewhat low capacity of the plants in Spain due to less than ideal solar resources. Due to the global debt crisis, Spain had considered cutting its artificially high feed-in tariff, but to preserve investor confidence, has chosen to delay bringing some plants online and limiting the output of others.

Thermal energy storage (TES) became a big topic in 2011 with demonstrations of 24 hour generation at a plant in Spain less than four months after startup. Seven to eight hours' storage appears to be the norm for parabolic trough plants at a cost of roughly an additional 10-11 % of the plant cost but can yield capacity factors over 50%, a key to profitability. Power towers operating at higher temperatures can achieve 10- 15 hours storage at a slightly less cost penalty.

New development and construction activities will intensify in 2012 in Australia, India, and China. China has licensed technology from eSolar and plans to build 2 GW of combined CSP/biomass plants in the next decade. India too has created a 20 GW by 2020 solar wish list. Australia continues to study the technology and is building a world study center of power tower technology.

As 2011 ends, the global capacity of utility-scale CSP will be right at 2 GW with approximately another 2500 to 3500 MW to be operational in 2012, depending on several factors. While some forecasters believe the US concentrating solar power capacity alone will reach 6 GW by 2015, SBI Energy analysis points to factors that suggest an installation rate that while consistent with the opportunities CSP represents, is more indicative of the current global economic and political realities. These factors include the events known as the Islamic Spring, the overall lingering economic doldrums, and current photovoltaic pricing wars as well as utility concerns regarding implementation of renewables on a large scale. While these concerns are not permanent, they will retard implementation of CSP for a few years.

CSP Energy tends to be CSP installation has been directly linked to government interest in the technology. CSP Global Markets provides insight into the current and future utility scale electrical generation CSP markets at both the plant and component level, with particular attention to the solar field elements which represent over 50% of the plant's cost. For every major component, global market size is provided and forecast through 2020 based on the SBI *Energy's* evaluation of the factors affecting the market growth as a whole.

## Contents

### CHAPTER 1 EXECUTIVE SUMMARY

### CHAPTER 2 BACKGROUND TO CSP MARKETS

Scope and Methodology of Report

Market Definition and History

General CSP Process Description for electricity generation

Figure 2-1 CSP process schematic

Market Categories

Parabolic troughs

Figure 2-2 Parabolic trough design

Figure 2-3 Parabolic trough mirror/receiver detail

Power Towers

Figure 2-4 Power tower design

Figure 2-5 Power tower mirror/receiver detail

Dish/Engine Systems

Figure 2-6 Dish/Engine design

Figure 2-7 Dish/engine concentration system detail

Linear Fresnel Reflectors

Figure 2-8 Fresnel lens optics

Figure 2-9 Linear Fresnel reflector detail

Thermal Storage

Figure 2-10 Thermal storage schematic detail

Hybrid Plants

Figure 2-11 Hybrid Plant Schematic

Figure 2-12 Hybrid plant power source by hour of the day

Concentrating Solar for Heat Generation

Industrial uses of solar heat

Figure 2-13 CSP -Solar Heat schematic

Figure 2-14 CSP -Global Industrial use

Residential uses of solar heat

Figure 2-15 CSP -US Residential installations

Comparison of Market Categories

Table 2-1 Features of CSP Categories

Table 2-2 Power Generation efficiency by CSP category

CSP Market Factors

Climatic Factors

Table 2-3 Climatic factors vs. Solar Energy Process

Figure 2-16 Geographic distribution of climatic factors

Power Distribution Factors

Table 2-4 Comparison of HVAC vs. HVDC

Table 2-5 Power generation factors vs. distance to market

Figure 2-17 Contribution to power grid by CSP category

Cooling Process Factors

Table 2-6 Cooling Options

Figure 2-18 Water cooling schematic

Figure 2-19 Dry cooling schematic

The Renewable Power Industry

Value of Electricity from Renewable Sources

Public policies affect on Renewable Power Generation

Policies to Promote Renewable Energy Sources

Production Tax Credits

Renewable Portfolio Standards

Renewable Power Direct Marketing

Renewable Feed-in-Tariff

Fossil Fuel Emissions Caps

Table 2-7 Pros and Cons of public policy use to promote renewable energy generation

Table 2-8 International public policies

Research investments in Renewable Energy

Table 2-9 US government investment in Renewable Energy through 2010

Table 2-10 Global public investment in Renewable Energy through 2010

Research Efforts in Solar Power

Table 2-11 US government investment in Solar Power through 2010

Table 2-12 US government investment in Solar Power currently allocated

Table 2-13 Global public investment in Solar Power through 2010

Table 2-14 Global public investment in Solar Power currently allocated

Figure 2-20 Public Investments vs. Solar power delivered through 2010

Figure 2-21 Public Investments vs. Solar power projected 2011- 2020

Research Efforts in CSP

Table 2-15 US government investment in CSP Technologies through 2010

Table 2-16 US government investment in CSP Technologies currently allocated

Table 2-17 Global public investment in CSP Technologies through 2010

Table 2-18 Global public investment in CSP Technologies currently allocated

Figure 2-22 Public Investments vs. CSP power delivered through 2010

Figure 2-23 Public Investments vs. CSP power projected 2011- 2020

Renewable Energy Market Size and Growth

Basis of Forecasts

PV

Figure 2-24 US PV Market 2007 - 2011, Nameplate MW Installed

Figure 2-25 US PV Market 2007 - 2011, Power Output, MW

Figure 2-26 US ROI on PV Investments 2007 - 2011

Figure 2-27 US PV Market 2012 - 2016, Nameplate MW Planned

Figure 2-28 Global PV Market 2007 - 2011, Nameplate MW Installed

Figure 2-29 Global PV Market 2007 - 2011, Power Output, MW

Figure 2-30 Global PV Market 2012-2016, Nameplate MW Planned

Geothermal power

Figure 2-31 US Geothermal power Market 2007 - 2011, Nameplate MW Installed

Figure 2-32 US Geothermal power Market 2007 - 2011, Power Output, MW

Figure 2-33 US ROI on Geothermal power Investments 2007 - 2011

Figure 2-34 US Geothermal power Market 2012 - 2016, Nameplate MW Planned

Figure 2-35 Global Geothermal power Market 2007 - 2011, Nameplate MW Installed

Figure 2-36 Global Geothermal power Market 2007 - 2011, Power Output, MW

Figure 2-37 Global Geothermal power Market 2012 - 2016, Nameplate MW Planned

Biopower

Figure 2-38 US Biopower Market 2007 - 2011, Nameplate MW Installed

Figure 2-39 US Biopower Market 2007 - 2011, Power Output, MW

Figure 2-40 US ROI on Biopower Investments 2007 - 2011

Figure 2-41 US Biopower Market 2012 - 2016, Nameplate MW Planned

Figure 2-42 Global Biopower Market 2007 - 2011, Nameplate MW Installed

Figure 2-43 Global Biopower Market 2007 - 2011, Power Output, MW

Figure 2-44 Global Biopower Market 2012, 2016, Nameplate MW Planned

#### Photovoltaics

Figure 2-45 US PV Market 2007 - 2011, Nameplate MW Installed

Figure 2-46 US PV Market 2007 - 2011, Power Output, MW

Figure 2-47 US ROI on PV Investments 2007 - 2011

Figure 2-48 US PV Market 2012 - 2016, Nameplate MW Planned

Figure 2-49 Global PV Market 2007 - 2011, Nameplate MW Installed

Figure 2-50 Global PV Market 2007 - 2011, Power Output, MW

Figure 2-51 Global PV Market 2012 - 2016, Nameplate MW Planned

#### Concentrating Solar Power

Figure 2-52 US CSP Market 2007 - 2011, Nameplate MW Installed

Figure 2-53 US CSP Market 2007 - 2011, Power Output

Figure 2-54 US CSP Market 2007 - 2011, Cost per Unit Installed

Figure 2-55 US CSP Market 2012, 2016, Nameplate MW Planned

Figure 2-56 US CSP Market 2012, 2016, Cost per Unit Planned

Figure 2-57 Global CSP Market 2007 - 2011, Nameplate MW Installed



Figure 2-58 Global CSP Market 2007 - 2011, Power Output, MW

Figure 2-59 Global CSP Market 2007 - 2011, Cost per Unit Installed

Figure 2-60 Global CSP Market 2012 - 2016, Nameplate MW Planned

Figure 2-61 Global CSP Market 2012, 2016, Cost per Unit Planned

Concentrating Solar Process Heat

Figure 2-62 US CSP Market 2007 - 2011, Installations and Capacity

Figure 2-63 US CSP Market 2007 - 2011, Power Savings

Figure 2-64 US CSP Market 2007 - 2011, Cost per Unit Installed

Figure 2-65 US CSP Market 2012, 2016, Nameplate MW Planned

Figure 2-66 US CSP Market 2012, 2016, Cost per Unit Planned

Figure 2-67 Global CSP Market 2007 - 2011, Planned installations and capacity

Figure 2-68 Global CSP Market 2007 - 2011, Planned Power Savings

Figure 2-69 Global CSP Market 2007 - 2011, Cost per Unit Installed

Figure 2-70 Global CSP Market 2012 - 2016, Nameplate MW Planned

Figure 2-71 Global CSP Market 2012, 2016, Cost per Unit Planned

## **CHAPTER 3 REGIONAL AND NATIONAL MARKETS**

CSP Global Market Initiative (CSP- GMI)

Table 3-1 Goals of the CSP-GMI

Figure 3-1 CSP-GMI Regions

Middle East --North Africa (MENA)

MENA Regional issues

Desertec Industrial Initiative

Dii GmbH

Table 3-2 Desertec Supporting Organizations

Figure 3-2 Desertec claims regarding CSP potential

Figure 3-3 Desertec vision of MENA power generation and distribution

Figure 3-4 MENA Regions suitable for CSP vs. implementation issues

Figure 3-5 MENA Regions suitable for CSP vs. market demand

Southwest United States-Mexico (USMEX)

USMEX Regional issues

Figure 3-6 USMEX Regions suitable for CSP vs. implementation issues

USMEX Regional markets

Figure 3-7 USMEX Regions suitable for CSP vs. market demand

Southern Europe (SoEur)

SoEur Regional issues

Figure 3-8 SoEur Regions suitable for CSP vs. implementation issues

SoEur Regional markets

Figure 3-9 SoEur Regions suitable for CSP vs. market demand

National Markets

## Algeria

Algerian development activities to date

Table 3-3 Algerian development efforts through 2011

Algerian installed and planned capacities

Table 3-4 Algerian installed and planned capacities through 2011

Algerian-specific issues

Algerian CSP market forecast 2012 - 2016

Figure 3-10 Algerian CSP market forecast 2012 - 2016

## Australia

Australian development activities to date

Table 3-5 Australian development efforts through 2011

Australian installed and planned capacities

Table 3-6 Australian installed and planned capacities through 2011

Australian-specific issues

Australian CSP market forecast 2012 - 2016

Figure 3-11 Australian CSP market forecast 2012 - 2016

## Brazil

Brazilian development activities to date

Table 3-7 Brazilian development efforts through 2011

Brazilian installed and planned capacities

Table 3-8 Brazilian installed and planned capacities through 2011

Brazilian-specific issues

Brazilian CSP market forecast 2012 - 2016

Figure 3-12 Brazilian CSP market forecast 2012 - 2016

Figure 3-13 Chilean CSP market forecast 2012 - 2016

China

Chinese development activities to date

Table 3-9 Chinese development efforts through 2011

Chinese installed and planned capacities

Table 3-10 Chinese installed and planned capacities through 2011

Chinese-specific issues

Chinese CSP market forecast 2012 - 2016

Figure 3-14 Chinese CSP market forecast 2012 - 2016

Egypt

Egyptian development activities to date

Table 3-11 Egyptian development efforts through 2011

Egyptian installed and planned capacities

Table 3-12 Egyptian installed and planned capacities through 2011

Egyptian-specific issues

Egyptian CSP market forecast 2012 - 2016

Figure 3-15 Egyptian CSP market forecast 2012 - 2016

Greece

Grecian development activities to date

Table 3-13 Grecian development efforts through 2011

Grecian installed and planned capacities

Table 3-14 Grecian installed and planned capacities through 2011

Grecian-specific issues

Grecian CSP market forecast 2012 - 2016

Figure 3-16 Grecian CSP market forecast 2012 - 2016

India

Indian development activities to date

Table 3-15 Indian development efforts through 2011

Indian installed and planned capacities

Table 3-16 Indian installed and planned capacities through 2011

Indian-specific issues

Indian CSP market forecast 2012 - 2016

Figure 3-17 Indian CSP market forecast 2012 - 2016

Iran

Iranian development activities to date

Table 3-17 Iranian development efforts through 2011

Iranian installed and planned capacities

Table 3-18 Iranian installed and planned capacities through 2011

Iranian-specific issues

Iranian CSP market forecast 2012 - 2016

Figure 3-18 Iranian CSP market forecast 2012 - 2016

Israel

Israeli development activities to date

Table 3-19 Israeli development efforts through 2011

Israeli installed and planned capacities

Table 3-20 Israeli installed and planned capacities through 2011

Israeli-specific issues

Israeli CSP market forecast 2012 - 2016

Figure 3-19 Israeli CSP market forecast 2012 - 2016

Italy

Italian development activities to date

Table 3-21 Italian development efforts through 2011

Italian installed and planned capacities

Table 3-22 Italian installed and planned capacities through 2011

Italian-specific issues

Italian CSP market forecast 2012 - 2016

Figure 3-20 Italian CSP market forecast 2012 - 2016

Jordan

Jordanian development activities to date

Table 3-23 Jordanian development efforts through 2011

Jordanian installed and planned capacities

Table 3-24 Jordanian installed and planned capacities through 2011

Jordanian-specific issues

Jordanian CSP market forecast 2012 - 2016

Figure 3-21 Jordanian CSP market forecast 2012 - 2016

Mexico

Mexican development activities to date

Table 3-25 Mexican development efforts through 2011

Mexican installed and planned capacities

Table 3-26 Mexican installed and planned capacities through 2011

Mexican-specific issues

Mexican CSP market forecast 2012 - 2016

Figure 3-22 Mexican CSP market forecast 2012 - 2016

Morocco

Moroccan development activities to date

Table 3-27 Moroccan development efforts through 2011

Moroccan installed and planned capacities

Table 3-28 Moroccan installed and planned capacities through 2011

Moroccan-specific issues

Moroccan CSP market forecast 2012 - 2016

Figure 3-23 Moroccan CSP market forecast 2012 - 2016

South Africa

South African development activities to date

Table 3-29 South African development efforts through 2011

South African installed and planned capacities

Table 3-30 South African installed and planned capacities through 2011

South African-specific issues

South African CSP market forecast 2012 - 2016

Figure 3-24 South African CSP market forecast 2012 - 2016

Spain

Spanish development activities to date

Table 3-31 Spanish development efforts through 2011

Spanish installed and planned capacities

Table 3-32 Spanish installed and planned capacities through 2011

Spanish-specific issues

Spanish CSP market forecast 2012 - 2016



Figure 3-25 Spanish CSP market forecast 2012 - 2016

United States

US development activities to date

Table 3-33 US development efforts through 2011

US installed and planned capacities

Table 3-34 US installed and planned capacities through 2011

US-specific issues

US CSP market forecast 2012 - 2016

Figure 3-26 US CSP market forecast 2012 - 2016

African Nation's Activities

Other African national development activities to date

Table 3-35 Other African national development efforts through 2011

Other African nation's installed and planned capacities

Table 3-36 Other African nation's installed and planned capacities through 2011

Other-African national specific issues

Other National Activities

Other national development activities to date

Table 3-37 Other national development efforts through 2011

Other nation's installed and planned capacities

Table 3-38 Other nation's installed and planned capacities through 2011

Other national specific issues

## **CHAPTER 4 CSP COMPONENTS: DESCRIPTION, USE, AND MARKETS**

Basis of Forecasts

Figure 4-1 Components as a percentage of plant costs

Engineering, Construction, and Procurement Companies

Table 4-1 EPC firms for installed and planned CSP facilities

Figure 4-2 Market share by EPC firm

High Tech Components

Mirrors, Frames and Cleaning Systems

Desired properties of CSP mirrors

Mirrors: Glass, plastic film. or polished metal

Table 4-2 Feature comparison between mirror materials

Research in material choice

Table 4-3 Global research in mirror materials

Table 4-4 Research in CSP mirrors

Installed and planned installations of mirrors

Table 4-5 Installed mirrors by material options

Table 4-6 Planned installations of mirrors by material options

Mirrors Producers

Table 4-7 Global mirror manufacturers, installed and planned

Mirror Market and Forecasts

Figure 4-3 US and Global CSP Mirror Market: 2007 - 2011

Figure 4-4 US and Global CSP Mirror Market: 2012 - 2016

Figure 4-5 US and Global CSP Mirror Market: 2016 - 2020

Frame systems

Table 4-8 Global CSP Frames manufacturers, installed and planned

Figure 4-6 US and Global CSP Frames Market: 2007 - 2011

Figure 4-7 US and Global CSP Frames Market: 2012 - 2016

Cleaning Systems

Table 4-9 Cleaning system manufacturers, installed and planned

Figure 4-8 US and Global CSP Cleaning System Market: 2007 - 2011

Figure 4-9 US and Global CSP Cleaning System Market: 2012 - 2016

Receivers and Heat Flow Systems

Receiver, receiver support and interconnections

Desirable properties in receivers

Table 4-10 Feature comparison between Receiver designs

Research in Receiver Design

Table 4-11 Research in receiver design and materials

Installed and planned installations of mirrors

Table 4-12 Installed receivers by design

Table 4-13 Planned installations of receivers by design

Current Receiver Producers

Table 4-14 Manufacturers of receiver components

Receiver Market and Forecasts

Figure 4-10 US and Global CSP Receiver Market: 2007 - 2011

Figure 4-11 US and Global CSP Receiver Market: 2012 - 2016

Collection, piping, valves and traps

Issues unique to CSP

Operating temperature range

Environmental conditions

Length of service

Longevity of service

Accessibility for preventative maintenance and performance issues

Table 4-15 Collection and piping issues unique to CSP

Companies with installed piping systems and experience

Table 4-16 Companies with installed piping systems and experience

Collection as a function of plant parameters

Heat Transfer Fluid (HTF)

Desirable properties in HTF

Table 4-17 Feature comparison between HTF systems

Research in heat transfer fluids

Table 4-18 Research in heat transfer fluids

Installed and planned installations of HTF

Table 4-19 Heat transfer fluids in installed CSP plants

Table 4-20 Heat transfer fluids selected for planned CSP plants

HTF Market and Forecast

Figure 4-12 US and Global CSP HTF Market: 2007 - 2011

Figure 4-13 US and Global CSP HTF Market: 2012 - 2016

Established Components

Steam Generation Plant

Table 4-21 Unique CSP Steam Plant Requirements/ Opportunities

Figure 4-14 US and Global CSP Steam Plant Installations

Figure 4-15 US and Global CSP Steam Plant Market Forecast 2012 - 2017

Cooling

Table 4-22 Unique CSP Cooling Requirements/ Opportunities

Figure 4-16 US and Global CSP Cooling Installations

Figure 4-17 US and Global CSP Cooling Market Forecast 2012 - 2017

Thermal Storage by Molten Salts

Table 4-23 Unique CSP Thermal Storage Requirements/ Opportunities

Figure 4-18 US and Global CSP Thermal Storage Installations

Figure 4-19 US and Global CSP Thermal Storage Market Forecast 2012 - 2017

Sun Tracking Systems

Table 4-24 Unique CSP Sun Tracking Requirements/ Opportunities

Figure 4-20 US and Global CSP Sun Tracking Installations

Figure 4-21 US and Global CSP Sun Tracking Market Forecast 2012 - 2017

Materials of Construction

Figure 4-22 Percentage of cost of CSP installations by material of construction

Significant issues concerning materials of construction: availability, cost

Steel

Table 4-25 Steel usage in CSP

Figure 4-23 US and Global steel market forecast in CSP, 2012 -2016

Copper

Table 4-26 Copper usage in CSP

Figure 4-24 US and Global copper market forecast in CSP, 2012 -2016

Brass

Table 4-27 Brass usage in CSP

Figure 4-25 US and Global brass market forecast in CSP, 2012 -2016

Aluminum

Table 4-28 Aluminum usage in CSP

Figure 4-26 US and Global aluminum market forecast in CSP, 2012 -2016

Concrete

Table 4-29 Concrete usage in CSP

Figure 4-27 US and Global concrete market forecast in CSP, 2012 -2016

Molten Salts

Table 4-30 Molten salts usage in CSP

Figure 4-28 US and Global molten salts market forecast in CSP, 2012 -2016

Silica

Table 4-31 Silica usage in CSP

Figure 4-29 US and Global silica market forecast in CSP, 2012 -2016

## **CHAPTER 5 MARKET PROMOTION, DISTRIBUTION, AND TRENDS**

Promotion of CSP Market

General environmental movement

Figure 5-1 Growth in public demand for renewable energy sourcing

Desire for energy independence

Table 5-1 History of energy independence efforts in the US

Fear of lack of access to oil

Table 5-2 Relationship between the “Islamic Spring” uprisings, oil resources, and CSP investments

Fear of nuclear power

Table 5-3 Shifts in perception of nuclear power after 2010 Japanese tsunami

Electrical Distribution by Region

Figure 5-2 Schematic of generic electric grid

North America

US electric grid

Table 5-4 Role of the North American Electric Reliability Corporation (NERC),

Figure 5-3 Major distribution lines of continental US electric grid

Electricity generation in Hawaii and Alaska

Figure 5-4 Major distribution lines of Hawaiian and Alaskan electric grids

Table 5-5 Role of the North American Electric Reliability Corporation (NERC),

Table 5-6 Upgrades to US electric grid to handle full CSP production by 2030

Canadian electric grid

Figure 5-5 Major distribution lines of Canadian electric grid

Mexican and Central American electric grid

Table 5-7 Status of Mexican and Central American electric grids

Figure 5-6 Major distribution lines within Central America

Table 5-8 Upgrades to Central American electric grid to handle full CSP production by 2030

South America

Table 5-9 Status of South America's electric grid



Figure 5-7 Major distribution lines within South America

Table 5-10 Upgrades to South American electric grid to handle full CSP production by 2030

Europe and Russia

Electrical Distribution within Europe

Table 5-11 Status of European electric grid

Figure 5-8 Major distribution lines within Europe

Table 5-12 Upgrades to European electric grid to handle full CSP production by 2030

Electrical Distribution within Russia

Table 5-13 Status of Russian electric grid

Figure 5-9 Major distribution lines within Russia

Table 5-14 Upgrades to Russian electric grid to handle full CSP production by 2030

Asia, India, and China

Electrical Distribution within Asia

Table 5-15 Status of Asia's electric grids

Figure 5-10 Major distribution lines within Asia

Table 5-16 Upgrades to Asian electric grid to handle full CSP production by 2030

Electrical Distribution within India

Table 5-17 Status of India's electric grids

Figure 5-11 Major distribution lines within India

Table 5-18 Upgrades to Indian electric grid to handle full CSP production by 2030

Electrical Distribution within China

Table 5-19 Status of China's electric grids

Figure 5-12 Major distribution lines within China

Table 5-20 Upgrades to Chinese electric grid to handle full CSP production by 2030

Australia

Electrical Distribution within Australia

Table 5-21 Status of Australia's electric grids

Figure 5-13 Major distribution lines within Australia

Table 5-22 Upgrades to Australian electric grid to handle full CSP production by 2030

Africa

Electrical Distribution within Africa

Table 5-23 Status of Africa's electric grids

Figure 5-14 Major distribution lines within Africa

Table 5-24 Upgrades to African electric grid to handle full CSP production by 2030

CSP Market Trends

Investment Climate

Figure 5-15 Investments over time and world events

Public opinion

Figure 5-16 Public demand for solar energy

Proliferation of demonstration plants

Table 5-25 Recent demonstration plants

Ease of entry compared to other renewable energies

Table 5-26 New construction costs as a function of location and energy source

Continued need for premium pricing

Figure 5-17 Relative declines in power generation by energy type

## **CHAPTER 6 COMPETITIVE PROFILES [SELECTED FROM LIST]**

3M

Abengoa USA/ Abengoa Spain

ACCIONA Solar Power/ACCIONA Energia

Alanod

Albiasa Solar

Ausra

Beacon Solar

Boeing

Bright Source Energy

Carrizo Energy

Cristaleria Espanola

Dow chemical

DuPont

Ener-T Global

Epuron

Eskom

E-solar

EuroTrough

Flabeg

Florida Power and Light

Grupo Enhol

HelioDynamics

Industrial Solar Technology Corp

Inland Energy

Naugatuck Glass

Paneltec Corp

Pilkington

Radco Industries

ReflecTech

Samca

SCHOTT Solar

Sener Group

Siemens

Sinoy Mirror

Sky Fuel

SoquiMich

Solar Millennium AG

Solar Power Group

Solel Solar Systems

Solargenix Energy

Sopogy

Stirling Energy Systems

## **CHAPTER 7 END USERS**

Public End Users

Utility Companies

Table 7-1 US Utilities operating CSP

Public perception of renewable energy

Figure 7-1 Changes in public perception over time

Perception of CSP vs. other renewable energy sources

Trends in public perception

Public willingness to pay premium pricing for renewable energy

Figure 7-2 Distribution of premium price options and acceptance

Industrial End Users

Uses by industry

Table 7-2 CSP Industrial Applications

Motivation factors for industrial users

Table 7-3 Leading motivators for industrial CSP use

Implementation Trends of industrial users

Table 7-4 Implementation Trends of Industrial CSP Applications

Appendices

## **List of Abbreviations**

Selected marketers contact information

Selected Organizations, Research Institutes, and Universities- contact information

Installed and Planned CSP Facilities

Selected CSP Facilities: Profiles and contact information

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