Executive Summary: Distributed Solar Energy Generation
Market Drivers and Barriers, Technology Trends, and Global Market Forecasts

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Section 1
EXECUTIVE SUMMARY

1.1 Distributed Solar PV Market Overview and Key Trends

In 2012, annual worldwide distributed solar photovoltaic (PV) system installations fell 11% compared to 2011, dropping to an estimated 19.2 GW\(^1\) representing $65.7 billion in revenue. The majority of the reduction can be attributed to the European Union (EU)\(^2\) where uncertainty surrounding feed-in tariff (FIT) reductions and rule changes to key incentive programs in Germany and Italy reduced installations. Distributed solar PV markets in Asia Pacific (led by China) and North America (led by the United States) grew 53% and 42%, respectively (by annual installation capacity). Distributed solar PV accounted for an estimated 69% of all solar PV systems installed in 2012, compared to 71% in 2011.

1.2 Key Trends in Distributed Solar Energy Generation

The global electric power industry is evolving from a financial and engineering model that relies on large centralized power plants owned by utilities to one that is more diverse – both in sources of generation and ownership of the generation assets. The following is a list of emerging trends that will shape the trajectory of the distributed solar energy generation (DSEG) market:

» **Price drops:** Module costs have dropped from roughly $4 per watt (W) in 2006 to, in some cases, below $1 per W in 2012. Lower prices are opening up new markets for distributed PV while also helping the technology reach grid parity more quickly in high-cost retail electricity markets.

» **Leasing programs:** In DSEG markets, innovative financing options are emerging that will make the technology available to more homeowners. Solar leasing companies such as SolarCity and SunRun are offering homeowners the option to have solar PV installed on their rooftops with little to no upfront investment.

» **Governments rein in financial incentives:** Like most energy technologies, DSEG is reliant on incentives from the government in some part of the value chain. As DSEG technologies have become more cost-effective, and amid a backdrop of government budget cuts, many governments are reining in popular FITs in leading markets. Germany, Italy, and China have all retooled their FITs, often placing greater emphasis on onsite generation, to prevent an overheated market. The industry is fully aware that lucrative financial incentives will not be around forever. As a result, many companies see 2017

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\(^1\) Installation data is based on preliminary government and industry association estimates. Official year-end totals are expected in May. Official installation totals for 2012 in Germany and China could each be 1 GW to 2 GW more than stated here.

\(^2\) Switzerland is not part of the European Union, but is included in the EU total for the purposes of this report.
(the year after solar PV investment tax credits expire in the United States) as the year that solar PV will be able to stand on its own without subsidies.

1.2.1 Distributed Solar PV Systems Forecast

During the forecast period (2013-2018) 220 GW of distributed solar PV will be installed worldwide, representing $540.3 billion in revenue. FITs and the commoditization of PV modules are the two factors creating double- and sometimes triple-digit growth in PV markets worldwide. Even if the EU follows in the footsteps of the United States and adds import tariffs on Chinese solar cells and modules, this will have minimal impact on the installation rate for two main reasons: First, Chinese manufacturers are already ramping up production in Taiwan and other countries to skirt the taxes; and second, solar PV modules and balance of system (BOS) costs will continue their rapid price declines, further diluting the impact of any tariffs. Ultimately, it is a great time for consumers and end users to purchase or lease distributed solar PV systems as prices continue to fall in the middle of fierce competition and continued consolidation. Moreover, the Asia Pacific and the Rest of World (Latin America, the Middle East, and Africa) markets are expected to see dramatic growth during the forecast period that will offset slowed growth in European and U.S. markets.

Navigant Research’s forecast is based on the assumption that PV module prices and installation costs will continue to decline, reaching a global average in the range of $1.76 per W to $2.47 per Watt installed anywhere in the world by 2018. At this price, solar PV will largely be at grid parity, without subsidies, in all but the least expensive retail electricity markets.

Chart 1.1 Annual Distributed Solar PV Installed Capacity by Region, World Markets: 2012-2018

(Source: Navigant Research)
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SCOPE OF STUDY

Navigant Research has prepared this report to present participants at all levels of the renewable energy industry, including equipment and hardware vendors, software companies, installation and service providers, and other balance of system component manufacturers, with a study of the market for distributed solar PV technologies. Its major objective is to determine the state of the industry and likely future growth of distributed PV systems. The report also provides a review of the major demand drivers, as well as key industry players within the competitive landscape.

The purpose of this report is not to provide an exhaustive technical assessment of the technologies and industries covered; rather, it aims to offer a strategic examination from an overall tactical business perspective. Navigant Research strives to identify and examine new market segments to aid readers in the development of their business models. All major global regions are included and the forecast period extends through 2018.

SOURCES AND METHODOLOGY

Navigant Research’s industry analysts utilize a variety of research sources in preparing Research Reports. The key component of Navigant Research’s analysis is primary research gained from phone and in-person interviews with industry leaders including executives, engineers, and marketing professionals. Analysts are diligent in ensuring that they speak with representatives from every part of the value chain, including but not limited to technology companies, utilities and other service providers, industry associations, government agencies, and the investment community.

Additional analysis includes secondary research conducted by Navigant Research’s analysts and its staff of research assistants. Where applicable, all secondary research sources are appropriately cited within this report.

These primary and secondary research sources, combined with the analyst’s industry expertise, are synthesized into the qualitative and quantitative analysis presented in Navigant Research’s reports. Great care is taken in making sure that all analysis is well-supported by facts, but where the facts are unknown and assumptions must be made, analysts document their assumptions and are prepared to explain their methodology, both within the body of a report and in direct conversations with clients.

Navigant Research is a market research group whose goal is to present an objective, unbiased view of market opportunities within its coverage areas. Navigant Research is not beholden to any special interests and is thus able to offer clear, actionable advice to help clients succeed in the industry, unfettered by technology hype, political agendas, or emotional factors that are inherent in cleantech markets.
NOTES

CAGR refers to compound average annual growth rate, using the formula:

\[ \text{CAGR} = \left( \frac{\text{End Year Value} + \text{Start Year Value}}{2} \right)^{\frac{1}{\text{steps}}} - 1 \]

CAGRs presented in the tables are for the entire timeframe in the title. Where data for fewer years are given, the CAGR is for the range presented. Where relevant, CAGRs for shorter timeframes may be given as well.

Figures are based on the best estimates available at the time of calculation. Annual revenues, shipments, and sales are based on end-of-year figures unless otherwise noted. All values are expressed in year 2012 U.S. dollars unless otherwise noted. Percentages may not add up to 100 due to rounding.
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