



## Advent Solar Corporate Backgrounder

Advent Solar ([www.adventsolar.com](http://www.adventsolar.com)) is a leading innovator of next generation silicon-based solar photovoltaic (PV) technologies. The Company has pioneered an advanced cell to system level architecture that delivers superior electrical energy output at lower costs. Products based on the Company's patented approach have been validated for high volume production. Advent Solar is focused on delivering Intellectual Property (IP) and services to enable higher valued solar cell and module products, providing significant advantages over conventional technologies.

Conventional PV architectures are rapidly approaching a point of diminishing return in achieving efficiency improvements, especially at a system level. For over three decades, the learning curve of solar PV has achieved cost improvements of approximately 19 percent per watt with each doubling of industry production output. However, this steady improvement has become increasingly difficult to maintain.

Traditional module manufacturing approaches have emphasized solar cell efficiency and wafer thickness as the primary drivers to improving cost per watt. The cell efficiency gains, however, have been negated at the system level by cumbersome manufacturing processes and further thickness reductions are becoming increasingly difficult. As a result, conventional PV manufacturing models are quickly approaching an architectural gridlock, unable to keep up with stringent market demands for higher energy output, quality and reliability.

Advent Solar is committed to moving beyond the constraints inherent in the conventional methods. Based in Albuquerque, New Mexico, U.S.A., Advent Solar was founded in 2002 to deliver the industry's best-valued silicon PV cells and modules. The Company's founder pioneered a revolutionary cell architecture, called Emitter-Wrap Through (or EWT), at Sandia National Laboratories. EWT is an innovative approach to cell design that eliminates grid obstructions and produces a more powerful cell. Advent Solar has an exclusive license to commercialize this technology.

In 2008, Advent Solar leveraged its heritage with EWT to introduce the solar industry's first cell-to-module solar architecture – Advent Solar<sup>®</sup> Ventura<sup>™</sup> Technology – which provides a blueprint for next generation solar solutions. Ventura Solar Technology is a platform-level architecture that combines EWT back-contact cells with semiconductor device manufacturing methods to create a highly-scalable platform for module manufacturing. Solar cells and modules developed with Ventura Solar Technology deliver high-energy output by optimizing silicon light capture, and dramatically improving cell and module-level connectivity to minimize resistive losses. The architecture provides higher cell-to-module efficiency, while using thinner silicon wafers to reduce costs.

The Ventura architecture incorporates a patented approach – Monolithic Module Assembly (MMA) – a highly efficient process for module manufacturing. The MMA process is based on proven, high volume, high precision semiconductor-style manufacturing techniques. Using robotic “pick and place” methods, each cell is perfectly arranged onto a monolithic integrated-circuit backsheet. By reducing the complexity of manufacturing processes, MMA results in highly repeatable, consistent module output with maximum yields. The Ventura architecture accommodates multiple silicon types, including multi-crystalline, mono-crystalline and Upgraded Metallurgical Silicon (UMG).

This advanced manufacturing approach enables the creation of Ventura Solar Technology based products that are *Beautiful by Design<sup>™</sup>*. With building integrated photovoltaic (BIPV) market needs in mind, they feature perfectly aligned, clean, blue silicon squares that customers are proud to showcase.

Advent Solar's executive leadership team has more than 250 years of combined experience in the solar and semiconductor industries, and it is dedicated to accelerating solar technology towards grid parity. For more information, please visit [www.adventsolar.com](http://www.adventsolar.com).

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