Researchers at the University of South Florida have developed an efficient organic solar cell that is manufactured with a novel spray-deposition method.

Photovoltaic (solar) cells have been used since the 1970s as an alternative to traditional energy sources. Most commercialized photovoltaics are made of inorganic silicon. However, these inorganic photovoltaic cells are produced in complicated processes and at high costs, limiting their use. Silicon-based cells are brittle and opaque, which means they cannot be used on windows where transparency is necessary. Further, installation is an issue since these solar modules are heavy and break easily. In addition, traditional installation locations like rooftops are limited in surface area compared to the window area in normal buildings, and even less in skyscrapers. To solve such drawbacks, photovoltaic cells using organic materials have been actively researched.

USF inventors have developed a method of manufacturing photovoltaic cells without the use of metal, which allows for novel solar cells with enhanced transparency. The production utilizes a thin organic film spray-on method, which is relatively inexpensive and simple. The organic film may be sprayed on to both rigid and flexible materials, allowing for diverse designs of solar cells. This technology eliminates the need for slow, costly manufacturing methods using high-vacuum and high temperature, which are associated with current inorganic thin film solar cells. This production method will provide the solar power industry with a cheaper method to produce versatile solar cells that can be installed on windows.