

Blog for Syrma Technology

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The Next Green Breakthrough: Printable Solar Cells

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A major milestone in green technology might be just around the corner. Printable solar cells—as simply and economically produced as printing a newspaper—may potentially turn any surface into a solar generator, bringing the advantages of low-cost renewable energy to any location on Earth—from large cities to remote villages.

This newest innovation revolves around cost-effective mass production of perovskite cells – which harvest light energy via a layer of microscopic crystals—1000 times smaller than the width of a human hair. These perovskite elements can be converted into a liquid form—literally a “solar ink”—which in turn can be printed onto plastic, glass or other lightweight materials in a manner similar as common inkjet printing.

Less Energy Creates More Energy

This represents a game-changing alternative to rigid conventional solar panels—nearly 90 percent of current worldwide production—which use thicker layers of silicon requiring lengthy manufacturing techniques, including purification via 1000 degree Celsius temperatures and large quantities of hazardous chemicals. The energy required to produce a single silicon cell from the factory is already equivalent to roughly 10 percent of that unit’s lifetime electrical output!

Working Out the Final Details

While printable perovskite cells have shown strong promise on the drawing board, a few technological hurdles still need to be cleared before they're officially declared "ready for prime time". One nagging issue has been how to extract energy from the paper-thin cell via an electron selective layer (ESL). The most effective ESLs have typically been made from powdered materials which still require high-temperature processing (up to 500 degrees Celsius), far beyond the tolerance of the thinner base plastics. This may have been solved by [recent studies at the University of Toronto](#), where researchers developed a method of creating the ESL via nanoparticles in a low-temperature liquid solution, with the addition of chlorine atoms to bind the layer to the perovskite electrode. Cells created via this new process reflected comparable performance to convention cells over long-term testing.

Solar Revolution 2.0

Over the near term, lightweight perovskite cells can be installed alongside existing rigid silicon cells, dramatically increasing the output of a rooftop solar array. In the future, experts predict flexible solar cells available on the retail market will extend the battery life of outdoor mobile devices, attached directly to the skin of laptops, tablets and smartphones. Extending to the distant corners of the world, lightweight solar panels will exponentially expand the electrical supply grid—harnessing the most abundant, environmentally-friendly resource known to man.

At Syrma, we recognize the vast potential of printable solar cells, which CEO Sreeram Srinivasan mentioned in [his recent presentation](#) discussing Industry 4.0 at this year's ELCINA CEO Summit in Bangalore. We continue to follow the latest advancements in this technology, and we're poised to partner with our OEM customers to jump to the forefront of this emerging global market.