

## First Plastic Electronics Factory Heralds New Applications

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Plastic Logic's factory in Dresden will produce commercial quantities of plastic electronics for flexible displays. This technology is likely to open up new markets for low-power signage and wearable, flexible electronics.

## NEWS ANALYSIS

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### Event

On 3 January 2007, Plastic Logic, which is based in Cambridge in the U.K., announced it has raised \$100 million in venture capital for the first factory to manufacture plastic electronics on a commercial scale. Located in Dresden, Germany, the factory will start production of flexible electronic paper (e-paper) display modules for portable devices in 2008.

### Analysis

Polymer electronics have been talked about for years, but have suffered from several problems, including poor transistor gain, susceptibility to contamination (particularly moisture) and low circuit densities.

Plastic Logic says it has solved most of these issues for specific applications, and can build reliable parts on inexpensive material. Its target market of e-paper displays lends itself to bulk printing processes. The module design uses a display area of polymer transistors driven by silicon integrated circuits. Gartner believes Plastic Logic's e-paper initiative will likely succeed and that it has the resources to further develop its organic transistor technology.

Unlike other display technologies, polymer e-paper displays can be bendable and flexible. They can also be fabricated on curved (but rigid) surfaces such as car dashboards, and require almost no power to maintain an image. Signage is already an attractive market for this technology.

As polymer electronics advance, devices could be embedded in clothing, soft toys and other products, where they could be used for radio frequency identification (RFID) tags. Flexible circuits used as price tags and security devices could be invisibly woven into clothing, providing benefits for retailers. The circuits could also store washing instructions that would be sensed by washing machines. Polymer electronics could also be used to display moving images on T-shirts, with consumers downloading images from digital cameras. Collectively, these applications represent a significant market opportunity.

Plastic electronics can be produced in large sheets but are relatively slow in operation. They won't replace silicon chips, which have a lower cost per transistor and offer dense, sophisticated and fast logic capabilities. Plastic circuits will thus be used in new and emerging applications like those mentioned above. We believe plastic transistors will initially succeed where their large-area capability is combined with the dense, fast logic of silicon.

Other companies also working on polymer technology include IBM, Philips, Xerox, Hitachi, Samsung and AU Optronics.

### RECOMMENDATIONS

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Investors and electronic systems companies should seriously evaluate polymer devices. This technology is likely to find wide application — particularly in consumer products — as costs fall with increasing volume.

## RECOMMENDED READING

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- "Hype Cycle for Semiconductors, 2006" — Plastic transistor technology, rising toward the Peak of Inflated Expectations, has the potential to be very important. **By Jim Tully and others**
- "Dataquest Insight: Mixed Prospects for LCD Replacement Technologies" — We describe how six alternative display technologies work, assess their strengths and predict the threat each is likely to pose to liquid crystal displays (LCDs). **By Paul ODonovan**

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