

## HP Labs – sample environmental projects

[HP Labs](#), the company's central research arm, engages in high-impact research to build a sustainable IT ecosystem and develop technologies that will reduce environmental impact beyond the IT sector. Embracing the "cradle-to-cradle" concept, HP Labs takes into account the entire life cycle of a product or service, ensuring it consumes the least amount of energy and materials possible. Examples of current projects underway at HP Labs include:

### **Flexible Displays**

[Information Surfaces Lab](#), HP Labs Palo Alto

Flexible displays are paper-like computer displays made almost entirely of plastic. HP Lab Director [Carl Taussig](#) and his team have created a unique roll-to-roll process that enables displays to become easily portable and consume less power and materials than today's computer displays. Popular applications for the technology could include electronic paper and signage. Notably, HP's roll-to-roll process could enable mass market for high-resolution flexible displays. Mass production of such displays allow the production of notebook computers, smart phones and other electronic devices at much lower costs since the display is one of the more costly components.

### **Memristors**

[Information and Quantum Systems Lab](#), HP Labs Palo Alto

Under the direction of HP Senior Fellow and Lab Director [Stan Williams](#), HP Labs researchers solved a decades-old mystery by proving the existence of a fourth basic element (named the memristor) in integrated circuits that could make it possible to develop far more energy-efficient computing systems with memories that retain information even after the power is off, so there is no wait for the system to boot up after turning the computer on. It may even be possible to create systems with some of the pattern-matching abilities of the human brain.

### **Photonic Interconnect**

[Information and Quantum Systems Lab](#), HP Labs Palo Alto

Copper connections among blades, boards and chips are part of the large problems of rising costs and energy consumption facing computer manufacturers: copper is not energy-efficient, is increasingly scarce and expensive – not to mention that mining it can create environmental problems. HP Senior Fellow and Lab Director [Stan Williams](#) and his team are working to replace these connections with photons of light can improve performance, solve bandwidth problems and also operate at much lower power than conventional electrical switches. Photonic interconnect also will advance connections to keep up with processors' expanding processing abilities as predicted by Moore's Law.

## City 2.0

[Sustainable IT Ecosystem Lab](#), HP Labs Palo Alto

Dubbed “City 2.0,” HP’s Sustainable IT Ecosystem Laboratory is exploring how information technology will enable the next generation of cities. HP Fellow and Lab Director [Chandrakant Patel](#) envisions seamlessly integrating an information technology ecosystem within a city infrastructure to address challenges related to issues like climate change, depletion of natural resources, and scarcity of water. Equipped with pervasive sensing and knowledge discovery, next-generation cities will utilize IT services to provision resources like power and water on demand from a system of flexible and configurable resource microgrids.

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