

Changing the Energy Equation

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Executive Viewpoint

We're witnessing a revolutionary wave of technology innovation that will drive better decision-making and better use of resources across every aspect of human experience.

Industry standard hardware has democratized the massive computing power once trapped in mainframes. Automation and virtualization enable that power to be flexed, scaled and shared. Intelligent software translates the raw data captured into meaningful information. Ultimately, we see a world where everything is delivered as a service — from computing power to business processes to personal interactions. If properly deployed, this intelligent and powerful technology can be brought to bear on society's greatest challenges.

Let's look at one:

The environmental debate has become a flashpoint in the global community. Each interest group has its own agenda. Whether you call it climate change, global warming, sustainability, or environmentalism, this is one of the most important issues of our time. Beyond the rhetoric and numbing arrays of statistics, the heart of the issue is energy. And how to use less of it.

While there are a number of distinct considerations when discussing environmental issues (like resource depletion) they in many ways overlap with energy. By taking into account the energy cost of everything that we do, we can pave the way to a cleaner world and sustainable economic growth. Information technology is the most powerful asset we have to start down that road.

When applying IT to the energy issue, it is important to acknowledge that IT itself is not energy neutral. Two percent of global carbon emissions are generated by IT. As an industry, we have an obligation to continually improve our energy efficiency and carbon footprint, and we are making meaningful progress. But the greater opportunity is using IT to address the other 98 percent. This may drive the 2 percent slightly higher, but it will shrink the overall pie.

Information technology can be applied to energy-intensive and carbon-heavy processes in three ways. We can make them more transparent, more efficient, and lighter.

Transparent: The energy you manage by measuring

In the context of energy, transparency drives behavior. As the world's largest technology company, HP operates the world's largest supply chain. It's a competitive advantage in the marketplace. It also gives us enormous leverage to influence behavior. We're using that influence to encourage better use of energy and resources across our ecosystem.

In 2004, we helped lead the development of the Electronic Industry Code of Conduct, extending our own social and environmental standards to our supply chain partners, regardless of where they operate. In 2008, to further increase transparency, we shared the list of our tier-one suppliers and we also published the aggregated greenhouse gas emissions of our supply chain. By 2012, suppliers representing 75% of materials, components, manufacturing and distribution will be required to report on key indicators. We're harnessing information to increase the responsible use of energy around the world.

In addition, new technologies are helping individual consumers and large enterprises tap into the smart grid — a priority for governments around the world — and better measure, understand and conserve energy use. For example, new software enables accurate insight into water consumption, from the pipeline to the meter to the customer billing system. Detroit Water and Sewerage, the third largest water and sewer utility in the U.S., has implemented HP's Advanced Meter Infrastructure solution to do just that. In the process, they've realized a productivity gain of 15 percent.

Detroit Water and Sewerage is one utilities customer. HP has quite a few. Our systems monitor operations for most of the world's nuclear power plants. Sixty-five percent of the world's transmission control systems run on HP platforms. Many of these customers are modernizing their data centers, wrapping them in business intelligence software, and automating their business processes. Through these partnerships, we will drive intelligence deeper into the utilities infrastructure, making energy use more transparent for both producers and consumers.

Efficient: The energy you use more resourcefully

Technology is also helping us be more efficient with the energy we do use. Always connected devices deliver the right information to the right place at the right time, reducing waste and increasing productivity. Thousands of our devices meet key eco-label standards. We're continually increasing the energy efficiency and recycled materials we use to build and ship them. By 2011, we're on target to save 1 billion KiloWatt-hours of electricity based on our design innovations

In the data center, we're wrapping our hardware with the latest automation and virtualization technologies to drive greater efficiency. In our own next-generation data centers, we save enough energy to power 90,000 homes for a year. That's today. In the future, we see truly sustainable data centers, run on local, renewable resources, like a waterfall or a pig farm. The physical infrastructure — based on a "cradle-to-cradle" view of the total energy cost — will be designed and operated to yield a zero net impact on the environment.

One example of steps we're taking toward that future is an EDS-designed and managed data center in Wynyard, UK. We've applied a systems approach to the entire building and its surrounding environment, from the sensors used to light the rows of servers to the roof that will collect runoff rainwater for landscaping and fire protection. We're even leveraging the cold wind blowing off the North Sea to lower temperatures of the IT equipment. We anticipate energy savings of 40 percent. When complete, the facility will be one of the largest and most efficient in Europe.

We're also helping countless customers transform existing environments, from modernizing data centers to implementing managed print services for greater efficiency. Perhaps an even greater opportunity lies in breakthrough nanotechnology. Networks of billions of nano-scale sensors can be embedded in buildings, agricultural fields, and large-scale structures to automatically provision energy resources. Electricity and heat matched seamlessly to demand. Water and fertilizer optimized to sensitive measurements in the soil. Maintenance performed on the Brooklyn Bridge exactly when needed.

Light: The energy you never use

But ultimately, the goal is making the world lighter, in other words, "dematerialization." Information technology can help replace energy-intensive and carbon-heavy methods — whether that's basic materials, or business processes, or entire business models. Think of how the digital transformation has completely redefined the production and distribution of music. Extend that model more broadly.

By 2012, all of the servers in the world will use as much power as was used by all of Mexico in 2007. Breakthroughs in photonics allow us to use light instead of copper wire to transmit data. Not only can we reduce the use of natural resources, we can dramatically reduce energy consumption while increasing bandwidth.

The cost of one round trip from New York to London for one person is 3,000 pounds of carbon dioxide. Today, HP has an advanced video collaboration service called Halo, it's like being in the same room. The service allows businesses to take advantage of an extremely reliable video collaboration experience, while eliminating the cost of travel and its impact on the environment. We're extending this technology to our Workstation PCs. You won't even need a dedicated conference room, you can have the same experience right from your desk, bringing multiple parties into a rich, video conversation. We'll continue to expand this technology so that you can have intuitive, immersive digital conversations, wherever you are...

In the U.S. in 2007, 2.3 billion magazines that were sent to newsstands were never read. MagCloud is a cloud service that allows anyone to produce professional-quality magazine, on demand. That means no large press runs, no pre-publication costs, no warehouses... no waste. The business model eliminates entire pieces of the supply chain. We're democratizing print publishing in a way that uses less energy and has less impact on the environment.

Looking to the commercial side of printing: up to 30% of traditional book stock is unsold. The same on-demand technologies behind MagCloud can be expanded into the digital commercial print industry. By minimizing overruns, we can dramatically reduce carbon emissions. Print on demand also allows publishers to tailor content and advertising to individuals. We see a very near future where we have best sellers where every single copy is personalized and, at the same time, every book has a home.

What's next?

HP will continue to focus in this area, but a larger effort is required. The goal is nothing less than a transformation in the way we organize and operate our future. Cities redesigned with energy as the organizing principal... Materials measured in terms of their total energy cost... Power, water, waste management and transportation dynamically provisioned by networks of nano-scale sensors...

Sustainable IT services that displace energy-intensive and carbon-heavy processes... A world of applied intelligence that supports nearly every aspect of human experience.

It's 2009. Yet we still manage our basic societal obligations, like energy, as if it were 1959. Innovation is the variable that will change the energy equation. Fortunately, unlike other energy assets, innovation is not in short supply.