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Making the Case for Environmental Sustainability

Introduction

HP's longtime commitment to environmental sustainability is integral to the ongoing success of not only our customers and partners, but our own company and the market at-large. Improved environmental performance helps everyone capitalize on emerging market opportunities, respond to stakeholder and customer expectations, and shape the future of the low-carbon, resource-efficient global economy.



This publication features a case study authored by Gartner analysts that spotlights how HP expanded the use of renewable energy into our operations with the completion of a 1-megawatt solar panel installation at our San Diego facility. With zero up-front costs or maintenance costs for HP, this installation provides 10% of the San Diego facility's energy, and will save \$750,000 over the next 15 years. This project can serve as a best practice for other companies who seek to reduce GHG emissions with no up-front costs and save considerably on energy costs.

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Gartner

From the Gartner Files

Case Study: HP Cuts Costs With On-Site Solar Power Generation

This Case Study examines HP's implementation of a 1.2-megawatt (MW) photovoltaic (PV) solar electric system at the company's San Diego campus and the use of a power purchase agreement (PPA) to finance the project. Corporate enterprises considering on-site solar power generation and vendors throughout the PV value chain will benefit from understanding the decision process, results and lessons learned from HP's solar experience.

Key Findings

- On-site solar power generation has the potential to reduce energy costs and provide a hedge against future electricity rate increases, in addition to supporting a company's environmental values.
- A large capital expenditure is not a requirement for on-site solar power generation. In the U.S., PPAs are widely used to finance corporate solar power projects.
- Incentives at the federal, national, state and local levels will determine the financial performance of any on-site solar power generation project. Identifying all available incentives and managing the application process is a valuable service provided by solar PPA vendors.

Recommendations

- Enterprises considering on-site solar power generation should evaluate it as part of an overall energy strategy that includes measures aimed at reducing energy consumption.
- If on-site solar power generation is feasible, but a capital budget is not available, then a solar PPA may be an effective means to pay for PV-generated power through operating expenses.
- Enterprises planning to implement a PV solar electric system should choose an experienced and knowledgeable system integrator and engage it early in the process.

WHAT YOU NEED TO KNOW

On-site PV solar power generation is growing in popularity among U.S. enterprises as an alternative source of power. Leading PV solar vendors offer installations on a solar PPA basis under which they own the PV system and sell the electricity it produces to the user. The solar PPA approach to PV systems is useful because it shifts the cost of solar energy from a capital expenditure to an operating expense, and it creates an incentive for the PPA provider to maximize the energy production of the PV system. It provides an almost risk-free opportunity for organizations to ensure adequate supplies of "green" electricity during peak daytime usage periods at a guaranteed average price. The host customer must ensure that the installation meets corporate standards for safety and esthetics, and it must have a reasonable expectation that the site of the PV array will not be disturbed by future changes to the property.

HP, one of the world's largest IT companies, chose SunPower, an integrated PV solar manufacturer and system integrator, to implement a PV solar electric system at HP's San Diego campus, with GE Finance taking over operation of the PPA. This partnership limited the risks that HP had to face. GE Finance financed and took ownership of the PV system, and SunPower assessed the site's location and power consumption needs, ensured the project kept within time and budget constraints, and drove ongoing operations. The project required no capital expenditure on the part of HP.

CASE STUDY

Introduction

HP has identified environmental sustainability as a key element of its corporate social responsibility strategy. HP has a multifaceted approach to driving sustainable practices in its business, from product development through supply chain management. To this end, HP has articulated three overarching priorities that guide its environmental efforts:

- Improving the energy efficiency of HP operations and products to help mitigate climate change.

- Managing materials and resources in products, and raising social and environmental standards throughout the supply chain.
- Promoting product reuse and recycling to achieve sustainable IT ecosystems.

The use of on-site renewable energy aligns well with HP's corporate values, but that alone is not enough to justify the project. Any decision on energy procurement must also make business sense and offer financial benefits to the company. HP was able to meet this objective by employing a PPA and by taking advantage of financial incentives available through the California Solar Initiative. The result is a 1.2-MW PV solar electric system at HP's San Diego campus that generates clean, renewable power, saves money and provides a hedge against future electricity rate increases.

The Challenge

HP faced several core challenges when assessing PV systems.

Busy management: A PV project represents a substantial construction task. HP's management had many priorities competing for its time and for resource allocation. A noncritical project, such as a PV system, while interesting, was not at the top of this priority list.

Lack of familiarity: The main challenge at the start centered on the lack of familiarity of HP's facilities and corporate social responsibility teams with PV solar projects. They did not know what would be required from HP to support a PV project or if it would meet their objectives.

Budget: The other main challenge at the start centered on securing money for the project. Any PV systems had to provide electricity for the campus at a cost that aligned with HP's existing electricity contracts. In addition, since HP was unfamiliar with the technology and was not in the electricity business, there was no management support for capital expenditures.

PV product selection: There are a multitude of PV technologies available, and deciding which is best suited to a corporate campus' needs may stymie adoption. In addition, the incentives from the government and the utilities can be opaque for first-time adopters, increasing the resistance to adoption due to a lack of clarity on how to obtain the incentives.

Maintenance: This is a hidden challenge for most PV systems. System life is measured on a 15- to 25-year basis, so optimal performance is essential for the core return on investment required to justify a project. Performance can be degraded by as much as 10% to 20% by simple problems, such as a tree casting shade onto a PV string or a damaged inverter.

Maturity of solar energy industry: PV solar energy is a predictable, relatively clean and long-term efficient source of electric power. As advances in technology continue, improved price/performance will drive down costs, and manufacturing improvements will reduce the amount of energy consumed in the production of PV panels. Even at today's electricity rates, especially in high-cost areas like San Diego, existing technology can provide immediate economic benefits once government subsidies are factored in.

Approach

At HP, the concept of including solar PV as an additional source of renewable energy was championed not by facilities, but by an internal marketing executive who recognized the environmental and corporate image benefits of such an initiative. Not only did this project provide measurable economic benefits by way of reduced energy costs, but it also bolstered HP's established image as a progressive, environmentally aware corporation taking an active and visible role in improving the environmental sustainability of its facilities. This initiative was clearly in concert with HP's engineering/technology culture.

With a strong internal champion and some clearly identified benefits for HP, the idea of on-site solar power generation was gaining support. At this point, still very early in the process, management was engaged and initial discussions with the facilities department were started. Initiating this dialogue at an early stage enabled HP to establish the business case and ensure organizational alignment before committing resources to scoping the project and administering the RFP process.

In addition, HP contacted PowerLight, a PV system integrator/installer that has since been acquired by SunPower, to provide advice concerning the basic approach to implementing a PV solar electric system and scoping of the project. By bringing in an experienced expert in an advisory capacity at this stage, HP was able to develop a conceptual

design and assess the feasibility of the project prior to sending out RFPs to vendors. Ultimately, SunPower was chosen as the vendor for the project on the strength of its nonpenetrating rooftop mounting system – which minimizes the chance of roof leaks – experience, financial strength and presales support.

Financing, always a concern, especially in today's economy, was addressed by HP using a PPA. The PPA contract allows organizations to acquire the PV solar power without the large capital investment. This is done via a long-term purchase agreement for electricity from the PPA supplier and a set rate that is lower than peak kilowatt-hour (kWh) rates, but allows the supplier to garner sufficient revenue to meet its financing requirements.

Results

HP deployed a 1.2-MW PV solar power generation system at its San Diego campus. The system is expected to produce about 1.9 million kWh of electricity a year.

The project is a clear success from HP's perspective. HP negotiated an electricity rate slightly lower than its current average electricity rate. Overall, its PPA contract should save the company about \$750,000 as well as reducing carbon dioxide emissions by about 16 million pounds (7,300 metric tons) over the 15-year term of the PPA. As it worked with SunPower, HP was able to obtain an early incentive rate from the State of California that made the project much more economical.

HP also limited its risk. The PPA contract it signed limits its responsibility for the PV system. The system owner, GE Finance, is responsible for the PV system. Given its financial interest in ensuring the system operates optimally, GE Finance monitors the system in real time. This led the firm to contact HP when one of the inverters malfunctioned, and arranged maintenance within 24 hours. This malfunction was transparent to HP, since its net-metering system automatically pulled more electricity from the transmission grid. Instead of paying for this electricity to its IPP partner, it paid it to its electricity broker.

A potentially bigger benefit for HP may be the improved relationship with its employees and the San Diego community. The employees were very interested in the project and tracked its installation

closely. In addition, as HP worked with SunPower, the two firms were able to offer HP employees a discounted rate for home PV solar systems that a significant percentage of employees adopted. The benefits to the community include the communication regarding the solar system, as well as an enriched dialogue with stakeholders, such as the mayor and congressional representatives.

Critical Success Factors

Power purchase agreement: It is fair to say that, without a PPA, this project probably would not have happened. At the time, the PPA was a relatively new financial innovation for enterprises implementing on-site solar power generation, and it turned out to be a key enabler for the project. By using a PPA, HP could keep the PV system off its balance sheet and pay for the solar power as an operating expense, thus avoiding a large capital expenditure. Such an investment would have been difficult to justify otherwise, because it does not directly impact HP's core business.

Alignment with corporate values: HP has a strong commitment to sustainability, and on-site solar power generation is consistent with HP's goal to reduce its environmental impact. The solar electric system is a visible demonstration of HP's commitment to these principles, for its own employees as well as visitors to the site. While the project had to stand on its own merits in terms of its positive financial impact, this value alignment was critical to gaining management support for the project.

Attractive state and local incentives: HP benefited from a generous rebate under the California Solar Initiative, as well as local incentives. Under the California program, the performance-based incentive (PBI) declines in steps based on the volume of solar power generating-capacity confirmed within each utility service territory. Based on the project timing, due in part to SunPower's ability to meet tight deadlines, HP was able to qualify for a PBI of 34 cents per kWh, which was a key factor that determined the financial viability of the resulting PPA.

Site availability: Site selection is extremely important for a PV solar electric system. An ideal site has a good solar resource, a favorable interconnection policy, an attractive combination of incentives and prevailing electricity rates, and

enough space to accommodate a system of the desired capacity. Equally important, the company must have a reasonable expectation that it will maintain control of the property for the 15-year term of a PPA, or the 25-year lifetime of a PV system if it is purchased, and that no major changes will be made that could affect the system.

Lessons Learned

Develop champions at all levels. HP's PV project was initiated by an idealistic employee who identified a core requirement for the company. As the project became more substantial, managers in the facilities, energy strategy and corporate social responsibility areas became interested and supported the project.

Build relationships with your prospective partner. The collaboration between HP and SunPower was made more effective through the trust engendered over the preliminary sales process and in navigating the regulatory hurdles. In addition, since SunPower chose to subcontract work to HP's partners, it was able to leverage personnel who were expert in HP's process.

Keep an open dialogue. In the midst of one meeting, HP requested that one roof be treated differently than the others – to ensure the firm could expand as required. This dialogue prevented the potential for expensive future rework.

Build in contingency. After the project was awarded, SunPower realized one of the buildings and its roofs was different, requiring a different approach to the PV installation.

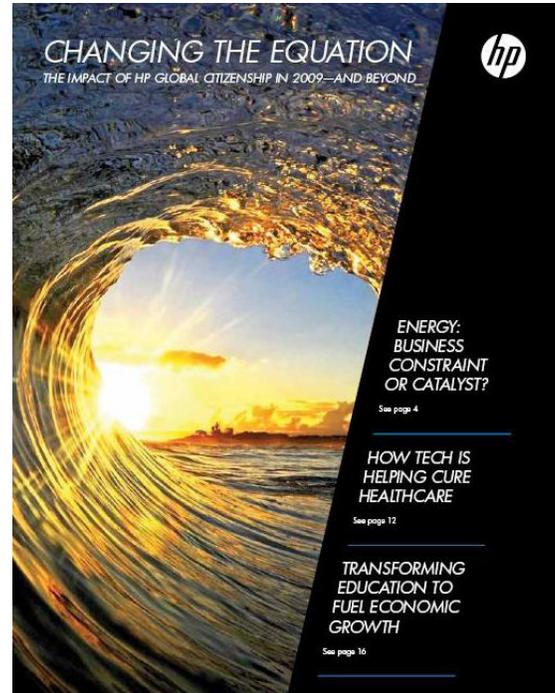
Don't rule out going it alone. Although solar PPA contracts have many benefits for corporations, if your organization has the capital, then it may be better to buy a PV system and obtain all tax and utility incentives yourself. However, you would need to balance this against the large capital outlay for a PV system, and the risk that the system will continue to perform at optimal levels throughout its lifetime, which implies an ongoing operational and maintenance requirement.

Research from Gartner RAS Core Research Note G00173324, James F. Hines, Alfonso Velosa, Jack Heine,
10 December 2009

HP Global Citizenship Report – Just Released

HP is continually pursuing ways to align our business goals with positive impacts on society and the environment worldwide. This just released report, “Changing the Equation, The Impact of HP Global Citizenship in 2009—and Beyond,” spotlights HP’s programs, performance and goals that span a broad range of areas. Inside you’ll find highlights from 2009 along with essays exploring issues reshaping business, society and the environment. These include **ethics and compliance**, **environmental sustainability** and **education** to responsible **supply chain management**, **privacy** and **social innovation**.

As part of our commitment to environmental sustainability, HP works every day to reduce the environmental impacts of our **operations**, as well as those of our suppliers. With the expansion of our enterprise services capabilities, HP can do more than ever to help our customers build sustainable businesses. In effect, we are leveraging the power of our **supply chain** to protect both the environment and **human rights**. For more information on HP’s commitment to environmental sustainability, please see the [HP Global Citizenship Report](#).



“As one of HP’s seven corporate objectives, global citizenship has long been integral to the success of our business. It drives us to meet higher standards of integrity, contribution and accountability as we align our business goals with our impacts on society and the environment.”

— Mark Hurd, HP Chairman of the Board, CEO and President

HP At Work for Customer Sustainability: UPS and Viacom

Highlighted in HP's new **Let's Do Amazing** brand campaign, HP partnered with **UPS** to develop the **HP Handheld sp400 All-in-One** that not only prints directly on the package, saving over one million pounds of paper per year, but also permits packages to be loaded much more quickly onto UPS's trucks.

Also part of the new brand campaign, HP worked with **Viacom** to reconfigure its printing fleets which reduced printing costs, energy costs and is expected to reduce paper use by an estimated 10 million sheets of paper in 2010.



HP Sustainability: Paying off on the Promise

- HP Managed Print Services helped business provider, Logica, reduce its overall printing costs by an estimated 39%, using an estimated 60% less paper and 32% less energy
- HP and EDS co-designed the Wynyard data center, one of the largest in Europe, to reduce energy consumption by 40%, cut emissions and save up to \$15 million annually
- In 2009, HP decreased total energy use by 9% compared with 2008
- Newsweek ranked HP as the greenest company among the 500 largest corporations in America
- HP recovered 118,000 tonnes of electronic products and supplies for recycling in 2009, including 61 million print cartridges
- In 2009, HP set the goal to reduce the energy consumption and associated GHG emissions of all HP products combined by 40 % compared with 2005 levels by the end of 2011
- Innovations in HP's high-volume HP desktop and notebook PC families are on target to save 1 billion kWh of electricity by 2011, relative to 2008

Industry Leading, Holistic Approach: Product Design, Operations, Recycling, Reuse

HP seeks to increase the performance of our products and services across the entire life cycle, and innovate new solutions that create efficiencies and reduce costs.

About HP

HP is a technology company that operates in more than 170 countries around the world. We explore how technology and services can help people and companies address their problems and challenges, and realize their possibilities, aspirations and dreams. We apply new thinking and ideas to create more simple, valuable and trusted experiences with technology, continuously improving the way our customers live and work.



Learn more by reading HP in Brief

For more information about HP and our [sustainability commitment](#), products and services please contact environment@hp.com.

HP and the environment

For decades HP has been an environmental leader, driving company stewardship through its HP Eco Solutions program, which spans product design, reuse and recycling as well as energy and resource efficiency. HP influences industry action by setting high environmental standards in its operations and supply chain, by providing practical solutions to make it easier for customers to reduce their climate impact and through its research on sustainability solutions that support a low-carbon economy. More information is available at www.hp.com/ecosolutions.