

Profit-Makers and Planet-Savers

Technology and life sciences companies are making money selling green products and services

By Rachel Vigoda

With energy prices at an all-time high and environmental consciousness becoming mainstream, businesses and consumers around the world are seeking smart ways to get greener. Whether their goal is to save money or feel good about reducing their carbon footprint, or both, customers are willing to pay for green solutions.

Opportunities abound for companies to profit by addressing environmental issues through the products and services they sell. Here's a look at some of the ways technology and life sciences companies are making green by selling green.

Selling data center efficiencies that save on hardware, space and power consumption

For many successful companies, helping the environment wasn't the initial objective, but an added benefit of their quest for innovative, efficient solutions. "Green was a byproduct," says Derek Rodner, Vice President, Marketing for PERFMAN. "We provide IT infrastructure management, and part of the outcome of a properly managed data center is green IT."

PERFMAN delivers a comprehensive systems management solution for large enterprises that uses advanced data collection, analysis and modeling to optimize the infrastructure. It's a

single software solution that can be used across all platforms, pinpointing, analyzing and resolving capacity and performance issues, allowing for better visibility of a company's entire IT infrastructure.

And with better visibility comes better solutions, such as server consolidation, explains Rodner. "In the past, servers were deployed to meet the peak demands of a single application and there was a lot of wasted capacity, along with power and cooling expenses," he says. "Server consolidation addresses that problem and PERFMAN enables better capacity planning across both the physical and virtual infrastructure to further reduce the need for additional servers."

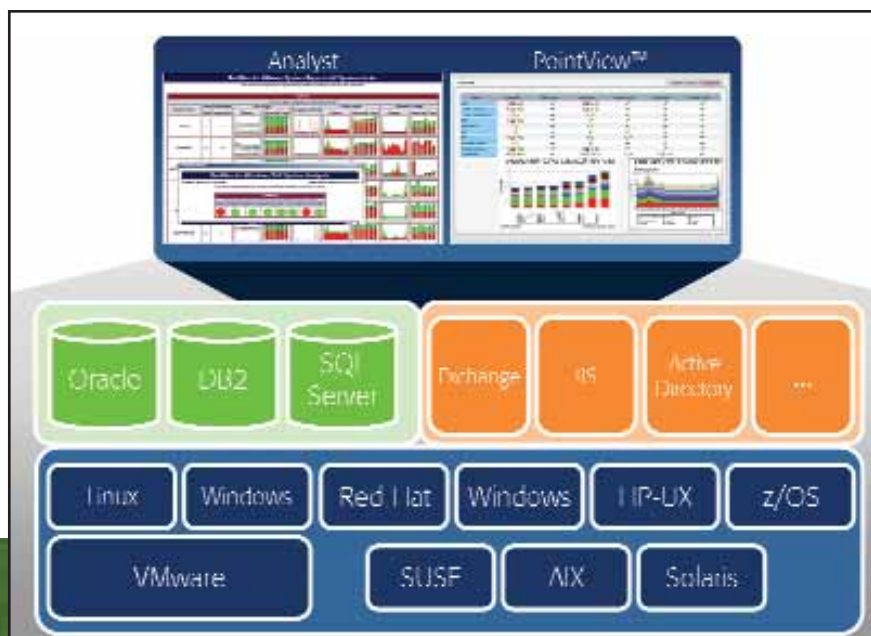
Server consolidation is accomplished by identifying underutilized servers and creating additional virtual servers on the same physical machines. "Virtualization" enables one server to function as many, each of which can run a

separate application or operating system. Fewer physical servers means reduced power consumption and cooling requirements.

Server consolidation is a boon for utility companies as well: they save money when the burden placed on infrastructure is reduced. An August 2007 Environmental Protection Agency study found that data centers in the U.S. consumed about 61 billion kilowatt hours of energy in 2006, which cost \$4.5 billion — equivalent to the electricity consumption of about 5.8 million average U.S. households. The EPA study recommended that utilities provide corporations with incentives to reduce power use in their data centers. So far, utilities in a handful of states have done so.

"It's an improvement to the environment, and a fiscal benefit for the corporation and for the utilities," says John Biglin, CEO of Interphase Systems, Inc., a management and technology consulting organization. "The cor-

PERFMAN's software solution creates better visibility of a company's entire IT infrastructure.



poration sees savings in hardware and operational costs — in terms of electricity and air conditioning needs — and the utilities don't have to expand their infrastructure. You go green, enhance your infrastructure and save money at the same time."

When a data center is consolidated through virtualization, a number of servers are no longer needed. To avoid having them wind up in a landfill or a storage facility that requires heating and cooling, Interphase also works with customers to recycle the hardware.

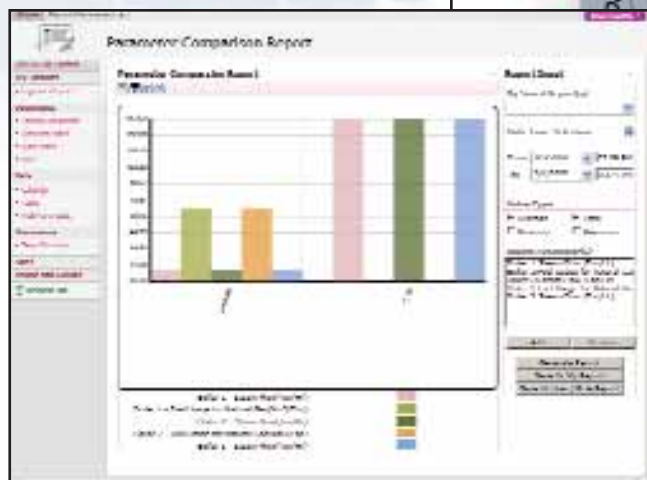
Technology services firm Liquid Networks, Inc., is achieving data center efficiencies in a different way. The company sells, integrates and manages ShoreTel Enterprise Unified Communications systems, a communications solution that saves energy and space. "We have a large client in New York who was using four cabinets — four 42U racks — in a data center, in just one location," says Stephen Benson, Managing Partner. "We replaced their system with ours, and converged down to one-half of a 42U rack. They gained approximately 75% cost efficiency on power, plus an 8-to-1 savings of space."

Because ShoreTel VoIP provides seamless communication, a side benefit is that it has enabled Liquid Networks itself to let call center employees work from home one or two days a week, cutting down on the number of cars on the road.

Datosphere, Nayatek's next generation data index, storage, management, retrieval grid platform, is also creating data center efficiencies. The first phase for Datasphere will be the ingestion and management of email.

Email is no longer just for business correspondence; it is used to store intellectual property, such as contracts, marketing plans, research and product roadmaps. Add to that the compliance legislation and legal discovery rules that require immediate retrieval of relevant email, and an efficient archiving system to organize and save emails becomes essential.

Datosphere cuts down on the number of servers needed for management of archived data, says Marc Olson, Principal and CEO of Nayatek. "Other technologies came out of the



Avanceon's iBoiler system is designed to help improve energy productivity.



Nayatek provides the next generation grid platform to index, store, manage, dashboard and retrieve data, while reducing the number of servers needed.

1990s, when the amount of email and the volume of electronic data was less. Today, we have an explosion of data putting a strain on the power grid, and new infrastructure is needed," Olson says. "Datosphere is a modern and highly optimized solution that provides organizations with a more efficient approach that requires fewer servers and, importantly, less energy."

According to Olson, Datasphere addresses a worldwide need: "Industry analysts indicate that only 14% of organizations globally have an email archiving solution, so it's clearly a market that's taking off."

Selling energy monitoring and management systems that save clients money and reduce emissions

Boilers don't usually fall into the budding-innovation category. But the manufacturing industry, which relies on boilers, is one of the world's largest consumers of energy, and there's a lot of room for improvement in how that energy is used.

"With tens of thousands of manufacturing facilities in the U.S. and worldwide, the amount of fuel burned is truly significant," says Martin Michael, Vice President of Avanceon, a manufacturing services and solution provider. "We have one customer who was spending \$1.5 million a month in oil for boilers."

Michael notes that "America often lags behind the rest of the world in terms of taking energy management and emission issues seriously." Avanceon is "introducing products and helping customers become more aware," he says. One such product is iBoiler, a system that manages the entire steam-generation process to improve energy productivity by reducing both the amount of energy consumed and the amount lost. Manufacturers save on energy costs while getting greener. "For some customers it's more important to save money, and for some it's more important to reduce emissions. The bottom line is that with iBoiler they get the value of both," says Michael.

DVL Automation's Web-based Energy Management System also offers dual value: comfort and energy efficiency. Building Automation Systems monitor temperature, humidity and CO2 levels, as well as energy utilization throughout a facility, automatically balancing energy optimization with comfort expectations. DVL Automation designs and installs these systems, then monitors and adjusts them by comparing operational data over weeks or years to achieve optimal efficiency. One client's LEED-Gold project in Scottsdale, Ariz., achieved 40% energy savings when compared to buildings built only seven years ago, according to DVL Automation

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10 ways any company can get greener

1 Assemble a "green team"

Beyond.com, a network of online niche career communities, created a green team to develop and promote environmentally friendly initiatives throughout the company. One result: a group of employees managed to reduce their carbon footprint by 4.21 tons over three months.

2 Use recycled paper for copying and printing

Life sciences company PuriCore printed its 80-page annual report on recycled paper, saving 27 trees, 55.24 pounds of water-borne waste and 2,175 pounds of greenhouse gases.

3 Conserve water

Waterless urinals will save up to 45,000 gallons of water a year in the new green building opened by software solutions provider SAP on June 16. Landscaping around the building also is designed to conserve water by reducing evaporation and runoff.

4 Consolidate facilities

On weekends at Penn State Great Valley, activities take place in one building whenever possible, reducing the amount of energy used for heating or cooling other buildings.

5 Embrace online media for communications

To reduce paper use, Beholder Productions, a visual communications company, relies on web sites, e-newsletters and e-brochures, combined with new media applications such as podcasts, blogs and online video applications.

6 Keep a green kitchen

Beyond.com stocks the office kitchen with re-usable dishes and utensils rather than disposable ones, and encourages employees to bring their own mugs to decrease paper cup waste.

7 Virtualize data centers

Technology solutions provider Arraya Solutions advises virtualizing data storage and servers to reduce power and cooling requirements.

8 Encourage carpooling and public transit

Bentley Systems, a software solutions provider, created an internal SharePoint web site to host resources for employee carpooling networks and local public transportation links.

9 Host virtual meetings

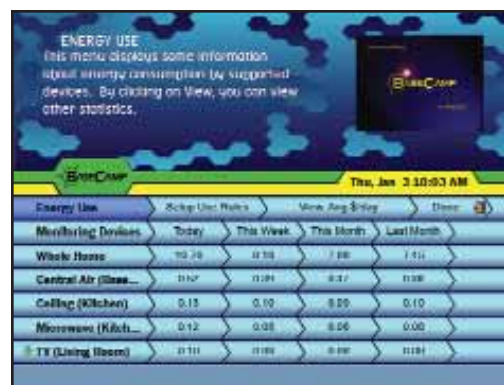
SAP saves time, money and greenhouse gases by using TelePresence instead of flying employees to weekly team meetings. If for every five virtual weekly meetings one flight is not taken, it results in 300 fewer working hours spent traveling and saves \$70,000 in travel expenses and 200,000 pounds of carbon emissions every year.

10 Seek innovative ways to keep the environment clean

When Canadian geese became a noise and health issue at Penn State Great Valley, the campus opted to get a dog to chase the geese, instead of spraying chemical repellents.



The Sterilox Food Safety System, developed by PuriCore, is used in grocery stores across the country to sanitize fresh produce by mimicking the human body's own natural antimicrobial.



BuLogics' easy to use control interface allows the user to set up and manage energy usage in a home or business for greener living.



Unysis's renovated facility in Eagan, Minn., sets a benchmark for green data center design.

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President Matt Dugan. The company is now working on a LEED-Platinum project in the Newtown Square, Pa., area for a client's new headquarters.

Going green with innovative energy management makes sense in the home, too. BuLogics, Inc., developed its BaseCamp software to do more than just deliver automatic settings and remote access to a home. BaseCamp uses the Z-Wave wireless standard to act as a central wireless communications hub for all Z-Wave enabled products in a home or commercial building.

With BaseCamp, homeowners can control and monitor lighting, appliances, thermostats, security and entertainment systems from anywhere in the world, as well as collect and aggregate electrical usage data to track power consumption. Homeowners can view real-time energy usage on their television, laptop or mobile devices to track usage trends to pinpoint where they are wasting energy on unused lights or appliances.

Benefits include energy conservation as well as increased safety and security. Mirka Walczak, CEO of BuLogics, says, "Our primary goal is to make it easy and affordable for people to monitor and reduce energy in both the residential and commercial markets."

Selling IT outsourcing at data centers that set the global standard for energy efficiency

Unisys, an information technology services and solutions company, is greening the infra-

structure at its outsourcing centers worldwide. First to be overhauled was a center in Eagan, Minn., that provides IT outsourcing services to clients and supports Unisys corporate operations.

Sustainability measures designed to dramatically lower the facility's carbon footprint and enhance the local environment included recycling more than 150,000 pounds of building materials during renovation; building a 30-inch raised floor to increase air flow around servers and enhance cooling efficiency on the floor; installing a Glycool air conditioning system that improves cooling efficiency by 44% over the levels normally found in data centers; and implementing virtualization technology in the data center. Virtualization alone reduced carbon emissions by 67% compared to single-application servers.

"We are committed to making our Eagan facility a benchmark for green data center design within the IT community," says Don Liedtke, Vice President, Global IT Outsourcing Operations at Unisys. "We intend to make ongoing changes to continually increase the energy efficiency of the building and make it a standard for all Unisys data centers, as well as those throughout the industry."

Selling paper-free marketing and communications services utilizing new media and saving trees

All companies need to get the word out about their technologies and services, and Beholder Productions, Inc., a visual communications company, has embraced a green way to do it. Beholder's Go Green Marketing initia-

tive is almost 100% paper-free, relying on the Web, new media and motion graphics applications to communicate messages. According to Emilia Andrews, COO of Beholder, clients see a quicker return on investment because "sales cycles are shorter. Clients' prospects are informed quicker and have the ability to interact with their web sites, e-brochures, podcasts, blogs and online videos," Andrews says.

Beholder also produces "webinars," which allow training sessions and meetings to be held completely online, reducing fuel costs and carbon emissions from travel. The company's online project management system, BP3, facilitates paper-free communication with clients and enables Beholder to serve national and international clients with less travel.

Selling a non-toxic technology that replaces hazardous chemicals in multiple applications

For Greg Bosch, CEO of life sciences company PuriCore, developing and selling green products is something to get excited about. "People feel good about our green technology. Our employees and customers are excited," he says.

PuriCore combines simple table salt, water and electricity into a liquid antimicrobial solution that's used for everything from sanitizing fresh produce in supermarkets, to cleaning chronic and acute wounds and burns, to disinfecting endoscopes and other delicate medical instruments.

The product mimics the antimicrobial produced naturally by the human body. It's just as effective as bleach, but completely safe for the environment. It has been green-lighted by the FDA and the Environmental Protection Agency, and is approved for use on organic food.

"The alternative in many of the applications in which PuriCore's solutions are used would be hazardous chemicals, which can be effective in killing microbes, but at the same time can be hazardous to the environment and potentially harmful to users, requiring personal protection such as gloves, eye protection, or maybe a mask or respirator," says Bosch. "The promise of PuriCore is so enormous, in so many different areas. We're looking into everything we can apply it to."

Paper-free communications is the green idea behind Beholder Productions.



Where the presidential candidates stand on green issues

Barack Obama

Excerpted from www.barackobama.com

Obama's Cap and trade: Obama supports implementation of a market-based cap-and-trade system to reduce carbon emissions by the amount scientists say is necessary: 80 percent below 1990 levels by 2050. Obama's cap-and-trade system will require all pollution credits to be auctioned. A 100% auction ensures that all polluters pay for every ton of emissions they release, rather than giving these emission rights away to coal and oil companies. Some of the revenue generated by auctioning allowances will be used to support the development of clean energy, to invest in energy efficiency improvements, and to address transition costs, including helping American workers affected by this economic transition.

Invest \$150 billion over 10 years in clean energy: Obama will invest \$150 billion over 10 years to advance the next generation of biofuels and fuel infrastructure, accelerate the commercialization of plug-in hybrids, promote development of commercial-

scale renewable energy, invest in low-emissions coal plants and begin the transition to a new digital electricity grid. A principal focus of this fund will be devoted to ensuring that technologies that are developed in the U.S. are rapidly commercialized in the U.S. and deployed around the globe.

Double energy research and development funding: Obama will double science and research funding for clean energy projects, including those that make use of our biomass, solar and wind resources.

Invest in a skilled clean technologies workforce: Obama will use proceeds from the cap-and-trade auction program to invest in job training and transition programs to help workers and industries adapt to clean technology development and production. Obama will also create an energy-focused Green Jobs Corps to connect disconnected and disadvantaged youth with job skills for a high-growth industry.

Convert our manufacturing centers into clean technology leaders: Obama will establish a federal investment program to help manufacturing centers modernize and Americans

learn the new skills they need to produce green products.

Clean technologies deployment venture capital fund: Obama will create a Clean Technologies Venture Capital Fund to fill a critical gap in U.S. technology development. Obama will invest \$10 billion per year into this fund for five years. The fund will partner with existing investment funds and our National Laboratories to ensure that promising technologies move beyond the lab and are commercialized in the U.S.

Require 25% of renewable electricity by 2025: Obama will establish a 25 percent federal Renewable Portfolio Standard to require that 25 percent of electricity consumed in the U.S. is derived from clean, sustainable energy sources like solar, wind and geothermal, by 2025.

Set national building efficiency goals: Obama will establish a goal of making all new buildings carbon neutral, or produce zero emissions, by 2030. He'll also establish a national goal of improving new building efficiency by 50% and existing building efficiency by 25% over the next decade to help us meet the 2030 goal.

Establish a grant program for early adopters: Obama will create a competitive grant program to award those states and localities that take the first steps to implement new building codes that prioritize energy efficiency.

Invest in a digital smart grid: Obama will pursue a major investment in our utility grid to enable a tremendous increase in renewable generation and accommodate modern energy requirements, such as reliability, smart metering and distributed storage.

John McCain

Excerpted from www.johnmccain.com

McCain's principles for climate policy:

- Climate policy should be built on scientifically sound, mandatory emission reduction targets and timetables.
- Climate policy should utilize a market-based cap and trade system.
- Climate policy must include mechanisms to minimize costs and work effectively with other markets.
- Climate policy must spur the development and deployment of advanced technology.
- Climate policy must facilitate international efforts to solve the problem.

McCain's cap and trade policy: McCain proposes a cap-and-trade system that would set limits on greenhouse gas emissions while encouraging the development of low-cost compliance options. A climate cap and trade mechanism would set a limit on greenhouse gas emissions and allow entities to buy and sell rights to emit,

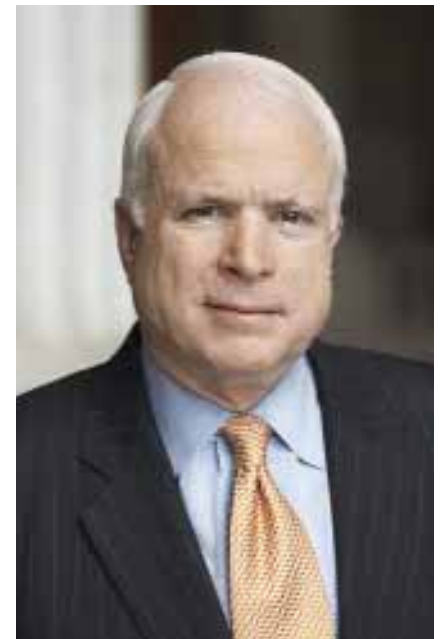
similar to the successful acid rain trading program of the early 1990s. The key feature of this mechanism is that it allows the market to decide and encourage the lowest-cost compliance options.

Greenhouse gas emission targets and timetables:
2012: return emissions to 2005 levels (18% above 1990 levels)
2020: return emissions to 1990 levels (15% below 2005 levels)
2030: 22% below 1990 levels (34% below 2005 levels)
2050: 60% below 1990 levels (66% below 2005 levels)

The cap and trade system would allow for the gradual reduction of emissions: The cap and trade system would encompass electric power, transportation fuels, commercial business and industrial business — sectors responsible for just below 90% of all emissions. Small businesses would be exempt. Initially, participants would be allowed to either make their own greenhouse gas reductions or purchase "offsets" — financial instruments representing a reduction, avoidance, or sequestration of greenhouse gas



For a complete look at Democratic candidate Barack Obama's policies, visit www.barackobama.com.



For a complete look at Republican candidate John McCain's policies, visit www.johnmccain.com.

emissions practiced by other activities, such as agriculture — to cover 100% of their required reductions. Offsets would only be available through a program dedicated to ensure that all offset greenhouse gas emission reductions are real, measured and verifiable. The fraction of greenhouse gas emission reductions permitted via offsets would decline over time.

To support the cap and trade system: McCain will promote the innovation, development and deployment of advanced technologies. McCain will reform federal government research funding and infrastructure to support the cap and trade emissions reduction goals and emphasize the commercialization of low-carbon technologies.

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Gov. Bill Richardson energizes crowd with his Titans address: **'Energy: A Flashpoint for Change'**

The Chestnut Street entrance to the Drexel University Main Building was abuzz with activity — crowds, TV cameras and print journalists; alternative-energy and fuel-efficient vehicles; and demonstrations of emerging energy technology.

It was early on the morning of May 19, and the crowd assembling for the Eastern Technology Council "Titans of Technology" event included the glitterati of the think tank/public policy wonks; elected and appointed officials; Council members; Drexel students, faculty and staff; and leaders and entrepreneurs from companies in and around the growing alternative energy sector.

All had come to hear New Mexico Governor Bill Richardson deliver the keynote address, "Energy: A Flashpoint for Change."

Preceding the address, a VIP breakfast was held in the magnificent Portrait Gallery to honor Richardson, who was Secretary of Energy and former Ambassador to the UN in the Clinton Administration. Now in his second term as governor, he is widely regarded as a prospect for a substantial role in the next administration, should Barack Obama win the presidency.

Event sponsors included PECO, the state Dept. of Community and Economic Development, Wolf Block, Blank Rome, the Wolf Family, The Tides Foundation, Aqua America, Quaker BioVentures, and David Knoll.

In her introductory remarks, Eastern Technology Council Managing Director Dr. Donna Gentile O'Donnell described Gov. Richardson as "a world class leader, who is part wise man, part wise guy ... the modern version of what Teddy Roosevelt advised leaders to

be, saying: Keep your eyes on the stars and your feet on the ground. Bill Richardson's 'boots on the ground' approach in the war on energy terrorism shows New Mexico taking one hill after another....The rest of us should head for the sound of the guns."

Gov. Richardson, using his book "Leading By Example" as a framework for his keynote, laid out a compelling case and method for moving away from oil dependency, and toward a "green collar workforce which can and will create a new economy of jobs, value and wealth in America and across the globe." He emphasized the critical diplomatic issues and how energy independence directly affects our national security and the very foundation of our economy.

"Bill Richardson is that rare public policy wonk who can deliver bad news with optimism and humor," Dr. Gentile O'Donnell said, summing up his message as: "The bad news is we have a lot of work to do. The good news is that we can do it."

The audience responded with frequent applause, and a very engaged question and answer session. The keynote was followed by a book signing and an extensive panel discussion with regional, national and international experts in all sectors of alternative energy applications, and their supporting industries.

Gov. Richardson concluded his visit at Drexel by meeting with students and faculty who are engaged in developing bench-based technologies. As he rushed off to his next event at the World Affairs Council, he said, "This was a great way to start my day in Philadelphia. The energy was amazing."

Energy, indeed.

Rich Greenawalt, Chairman of Drexel University, Governor Richardson, Dr. Donna Gentile O'Donnell, and Drexel President Constantine Papadakis enjoy a lighter moment at the VIP breakfast before the keynote address.



Eastern Technology Council CEO Dianne Strunk introduces Governor Richardson to Karen Keating Mara, as Dr. Elizabeth Dale of Drexel University looks on in the Drexel University Portrait Gallery.

The Eastern Technology Council's Chairman Rob McCord (far left) and Managing Director Dr. Donna Gentile O'Donnell (second from right) greet Philadelphia City Council members Maria Quinones Sanchez, Curtis Jones, and Jim Kenney.



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Under McCain's plan:

- Emissions permits will eventually be auctioned to support the development of advanced technologies. A portion of the process of these auctions will be used to support a diversified portfolio of research and commercialization challenges, ranging from carbon capture and sequestration, to nuclear power, to battery

development. Funds will also be used to provide financial backing for a Green Innovation Financing and Transfer (GIFT) to facilitate commercialization.

- McCain will streamline the process for deploying new technologies and requiring more accountability from government programs to meet commercialization goals and deadlines.

- McCain will ensure rapid technology introduction, quickly shifting research from the laboratory to the marketplace.
- McCain will employ the inherent incentives provided by a cap and trade system along with government-led competitions as incentives for new technology deployment.
- McCain believes an effective and

sustainable climate policy must also support rapid economic growth. McCain will use a portion of auction proceeds to reduce impacts on low-income American families. The McCain plan will accomplish this in part by incorporating measures to mitigate any economic cost of meeting emission targets.