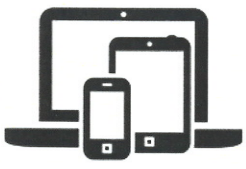
Can the Internet Help Save the Environment? Yes.

"Investment in broadband infrastructure is a fundamental part of sustainable social and economic growth, and is essential to building a greener and more equitable California."

John Gioia, Contra Costa County Supervisor
President of California State Association of Counties
Member of California Air Resources Board

Broadband and the Environment: Technology Strategies for a Greener California

We've all heard of the ways we can help save the planet, such as conserving energy in our homes and driving fewer miles in our cars. Such common environmentally-conscious strategies become a lot easier when technology supports our efforts. It turns out that high-speed Internet—also known as broadband—can do exactly that.



Today, workplaces, government offices, farms, schools, hospitals, and households use broadband to cut costs and carbon emissions. Internet tools and electronic communications allow Californians to use computers and smart devices to work from home, manage irrigation in the fields, apply for a driver's license, get a check-up with a healthcare specialist, and monitor thermostats while away from home. When we use less fuel, water, and electricity, we emit less air pollution into the atmosphere.

These modern-day approaches to managing daily life all depend on having fast, reliable, and affordable Internet service everywhere—from the kitchen table to the tomato field. E-Government, Telehealth, Teleworking, Precision Agriculture, Smart Building, and Smart Grid are key opportunities in which Californians are making progress to conserve resources and promote cleaner, healthier lifestyles.

Affordable, accessible broadband is critical for California to meet its greenhouse gas (GHG) emissions goals, which will reduce impacts on the environment and improve the quality of life for all.
The data proves it. Let's all promote broadband for a greener California!

August 2014

"In Northern California alone, the most efficient 481 buildings saved approximately $148 million in annual utility bills and reduced CO_2 equivalent to 50,800 homes."

U.S. Environmental Protection Agency
April 2014

E-Government

Skip the Trip, Go Online

E-Government services allow Californians to obtain services online, saving time, money, and travel-related pollution. The California Department of Motor Vehicles (DMV) encourages customers to "Save Time, Go Online", and the program has been met with great success. In 2013, nearly one quarter of all California vehicle registrations—over 8 million—were completed electronically.[1] Drivers were able to trim the number of trips to the DMV while keeping fuel costs in their wallets.

Governments at all levels can drive efficiency while improving customer service.[2] The federal government is encouraging the shift to electronic communications, for example, by promoting online tax filings and direct deposit payments. Those activities alone last year saved the federal government $64 million in paper costs.[3]

Telehealth

Bring Quality Healthcare Closer to You

Telehealth brings the healthcare provider and patient together online, ensuring quality and timely care, saving travel headaches, and encouraging better monitoring of health status. Each online health appointment saves 95 percent of GHG emissions that would result from a typical drive to a doctor's office.[4]

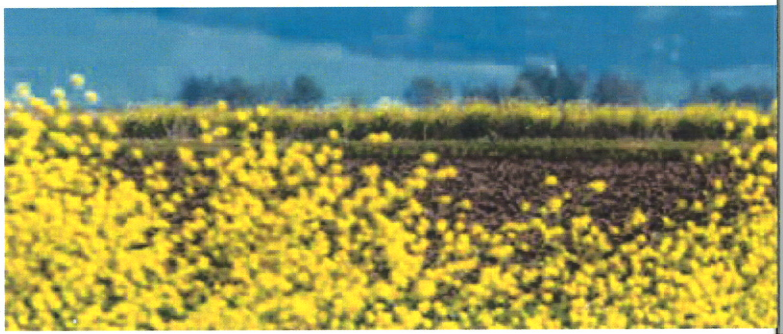
Based on the findings at a California hospital serving a large rural area, the California Telehealth Network estimates that the value of each follow-up consultation conducted online saves $300 by eliminating transportation costs and counting wages that would be lost due to time off. In a single year, those savings added up to 288,000 fewer miles driven at a single hospital. Imagine the combined impact of online consultations across all 345 hospitals in the state.

Teleworking

Cut Traffic and Carbon Emissions

Teleworking utilizes alternative worksites and video conferencing while generating cost savings, boosting employee satisfaction, and reducing GHG emissions. Companies that encourage their employees to telework see results both in economic value and in positive impacts on the environment. If an employee works from home one day per week, reducing car travel by 7 percent and air travel by 10 percent, the carbon reduction impact could be as much as 65 megatons of CO_2 with a corresponding national economic value of $25 billion by 2020.[5]

Experts at UC Davis and UC Irvine reviewed available research and discovered similar findings. For home-based workers, they found that work-related miles driven were reduced by 90 percent. For telecommuters working at a central site away from the main office, mileage reductions ranged between 62 and 77 percent.[6]



Precision Agriculture

Save Water and Increase Productivity

Precision Agriculture preserves one of California's most precious resources: water. Water delivery accounts for 20 percent of the state's total energy consumption, and the agricultural sector is a major user.[7,8] Precision Agriculture uses real-time information to help farmers more efficiently irrigate and monitor their crops. Wireless broadband-enabled systems supply satellite observations and data about the plants, soil, atmosphere, and irrigation systems to help farmers manage their fields and livestock.

The results are encouraging: farmers have seen increases in productivity ranging from 20 to 70 percent, and a decrease in water use ranging from 20 to 30 percent[8] (depending on how many water-use efficiencies have been previously implemented on a given farm). More efficient agricultural practices save money and reduce water and delivery-related energy consumption.

Smart Building

Make Buildings More Energy Efficient

Smart Building strategies make for better working environments and lead to significant energy savings. Energy use in buildings ranks as the second highest source of GHG emissions in California.[9] In Northern California alone, the 481 most-efficient buildings saved approximately $148 million in annual utility costs and reduced GHG emissions equivalent to that produced by 50,800 homes.[10]

Modern construction standards are leading to better efficiency, but energy waste persists in older buildings because of inefficient heating and cooling, lighting, and other power systems.[11] Building management systems (BMS) use technology to control and monitor usage patterns, which can lead to major improvement even in older construction. Utilities and technology companies now are providing online services to track daily energy usage for industry, public facilities, and residences.

Smart Grid and Electric Vehicles

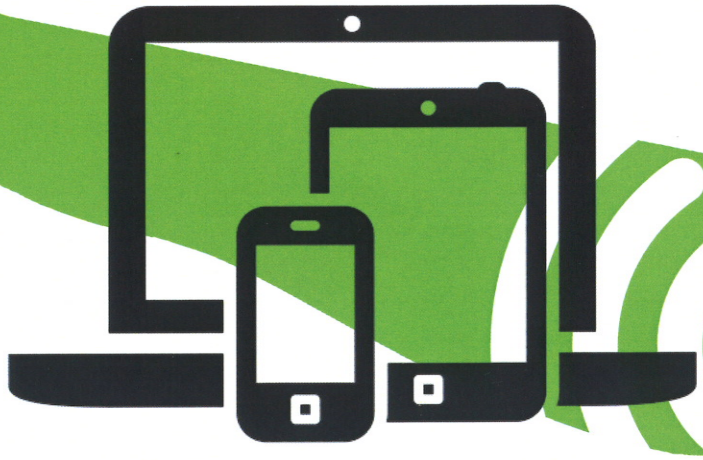
Drive for a Cleaner California

The Smart Grid is an electricity supply network that uses digital communications technology to detect and react to changes in usage. While providing critical information to help Californians conserve at work, at home and on the road, the Smart Grid also allows for easier integration of solar and wind in the power supply.[12]

When the Smart Grid and Electric Vehicles (EVs) operate together seamlessly, large reductions in energy usage and GHG emissions can be achieved. The transportation and power sectors, in fact, have the highest potential for Internet-enabled reductions of GHG pollution— and now account for more than 40 percent of the estimated total reductions in California. EVs are one of the most promising technologies for reducing fuel consumption and air pollution.[12,13]

To reach their highest potential in cutting energy use and resulting emissions, the Smart Grid and EVs must work interdependently. For example, EV owners need online access to obtain real-time information from the Smart Grid to ensure that they plug in when electricity demand—and usually prices—are at their lowest.

Without online monitoring and communications, it is impossible to manage energy demand in 21st century California. The repercussions of poor management are large on the environment as well as the economy. For example, when the electric grid becomes strained, often-dirtier backup generators are fired up to meet peak demand.[13] Carefully coordinated policy, planning, and investment around EV infrastructure and the Smart Grid will go a long way to help Californians realize their largest potential for reducing air pollution and GHG emissions.



Learn More

- **Read** Broadband as a Green Strategy: Understanding How the Internet Can Shrink our Carbon Footprint, 2014. http://valleyvision.org/resources/broadband-as-a-green-strategy-understanding-how-the-internet-can-shrink-our-carbon
- **Read** Broadband as a Green Strategy Policy Brief, 2012. http://valleyvision.org/resources/broadband-as-a-green-strategy-policy-brief-2012
- **Read** Getting Connected for Economic Prosperity and Quality of Life: A Resource Guide for Local and Regional Government Leaders to Promote Broadband Deployment and Adoption. http://www.cetfund.org/resources/information/model-policies-and-ordinances

Act Now

- **Encourage** your jurisdiction to implement the Checklist in the CETF Resource Guide for Local and Regional Government Leaders: Getting Connected for Economic Prosperity and Quality of Life.
- **Champion** policies that support broadband infrastructure investment and include broadband infrastructure in land use and other community plans.
- **Promote** the role that broadband plays in achieving emission reductions when state leaders are developing greenhouse gas reduction policies, goals, and investments.

CETF
CALIFORNIA EMERGING TECHNOLOGY FUND

About the California Emerging Technology Fund

The mission of the California Emerging Technology Fund is to close the Digital Divide in California by promoting high-speed Internet access at home. The goal is to reach 98% of all residences with broadband infrastructure and to achieve 80% home adoption by 2017. This statewide goal can only be accomplished if the following specific hard-to-reach target communities achieve at least a 70% adoption rate: low-income populations, Latino households, rural communities, seniors and people with disabilities. For more information, please visit www.cetfund.org.

VALLEY VISION
Connect. Partner. Impact.

About Valley Vision

The mission of Valley Vision is to provide research, collaboration, and leadership services to make California's Capital Region prosperous and sustainable. Valley Vision functions like a social enterprise, combining the rigor of a for-profit business with the passion of a nonprofit to drive large-scale initiatives to success. The goal is to bring individuals and organizations together to find impactful solutions to issues pertaining to social equity, the environment and economic development. For more information, please visit www.valleyvision.org.

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For more information see summary of the current literature related to pollution-reduction benefits of broadband-enabled applications at http://valleyvision.org/projects/broadband-as-a-green-strategy.

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