

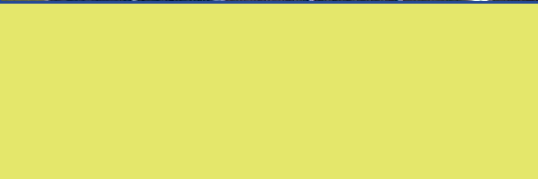


MAYOR JERRY SANDERS

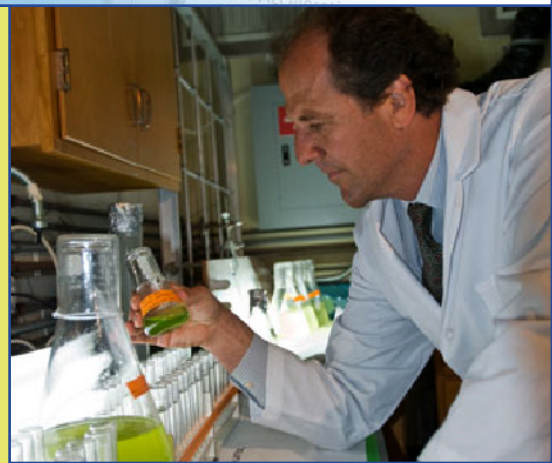


CLEAN TECH LEADERSHIP STRATEGY ECONOMIC GROWTH SERVICES

OFFICE OF THE MAYOR



CLEAN TECH INITIATIVE
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Executive Summary

California's clean technology industry has grown in both number of companies and number of jobs since 2006, when Mayor Jerry Sanders launched his Cleantech Initiative to catalyze industry growth in the San Diego region. Experts expect that the passage of Assembly Bill 32, the state's ambitious plan to reduce greenhouse-gas emissions to 1990 levels by 2020, will accelerate the industry's growth by creating a market for innovations to help corporations comply with the mandate.

With a wealth of research institutes and an entrepreneurial economy, San Diego is uniquely positioned to develop and support a high-growth, innovation-driven industry such as clean technology. Since 2006, more than 100 new cleantech companies have launched in San Diego, many of them affiliated with the city's world-class universities and biotechnology industry. With early support and commitment to nurturing this sector, San Diego stands to become a hub for the development and commercialization of cleantech products and technology.

The City of San Diego will reap substantial economic and quality-of-life benefits from the growing demand for cleantech products and technologies if it succeeds in creating a business environment conducive to the growth of this new sector.

While San Diego continues to enjoy traditional strategic advantages such as a highly skilled workforce, world-class universities, entrepreneurial expertise and proximity to the international border with Mexico, these advantages alone are not sufficient to guarantee success.

The competition for jobs will only increase as other states and nations attempt to lure innovative local companies. The existing strengths of San Diego will attract the attention of prospective companies, but innovative City policies, dedicated resources, aggressive advocacy at the state and federal level, and a renewed focus on assisting companies at every stage of growth will be necessary to ensure the long-term growth of the cleantech industry in San Diego.

The Mayor's cleantech strategy has three key desired outcomes: creating jobs, generating additional revenue for the City through new economic activity, and improving environmental quality. More specifically, these benefits include:

1. Creation of new "green-collar" job opportunities for local residents
2. Better services for citizens through generation of new revenues for the City
3. Environmental benefits, including reduction of greenhouse gas emissions
4. Increased demand for research and development at our local universities
5. Creation of new business and research opportunities for our local biotechnology and telecommunications sectors
6. Creation of opportunities for entrepreneurship

This report provides an overview of the elements of a proposed strategy and highlights various policy recommendations and targeted incentives.

San Diego's Cleantech Cluster

As of mid-2009, there are 325 cleantech companies in San Diego County, 100 of them located within the City of San Diego. The sector is dominated by companies developing clean technologies in the following categories:

- Renewable Energy Generation & Energy Efficiency
 - Energy Production: solar, biomass
 - Energy Storage: next generation of rechargeable battery technologies, ultracapacitors and thermal energy storage
 - Energy Efficiency Technology/Materials and Energy Management Solutions: energy-management software, advanced construction materials, bio-mimetic and smart metering infrastructure
- Clean Transportation
 - Biofuels and Low-Emission & Zero Emission Vehicles: biodiesel fuel production, algae biofuel, hybrid-electric technology and fuel efficiency engine design & manufacturing
- Water and Wastewater
 - water recycling technologies, ultra-filtrations systems, and water conservation technologies
- Recycling and Waste Management: material recycling, recycling equipment, and waste remediation and waste conversion

San Diego's cleantech cluster is distinctly different from the biotechnology and wireless telecommunication sectors. While those sectors tend to be geographically concentrated in the Torrey Pine Mesa and Sorrento valley area in close proximity to University of California, San Diego, the local cleantech industry is scattered throughout the region, dictated by proximity to natural resources, specific land-use requirements and access to affordable land.

The region also is seeing the convergence of technologies from biotech and wireless/telecommunication with cleantech innovations in areas such alternative fuel, smart wireless sensors technologies and biomimetic solutions.

A number of San Diego's cleantech companies have roots in other technological disciplines. Prominent among them is Sapphire Energy, which was formed by veterans of the biotechnology industry who built a molecular platform that converts sunlight and carbon dioxide into renewable, carbon-neutral alternatives to conventional fossil fuels. The company's fuel products are chemically identical to molecules in crude oil, making company products compatible with the current energy infrastructure — cars, refineries, and pipelines.



On-Ramp Wireless is an example of a local firm born out of the region's established wireless telecommunications industry. On-Ramp has developed a low-power wireless communications system with an extensive range and capacity that enables customers to implement wireless network architectures covering thousands of devices with minimal infrastructure. This technology will allow utilities to remotely monitor pipelines and remote facilities for leaks, damage and other problems.

Economic and Sustainable Development Goals

Cleantech is an emerging industry that will become a vibrant economic sector in the region. To help position the city to become a dominant cleantech hub, we have established a long-term economic and sustainable development goals for the region to realize over the next 20 years. This roadmap will guide the City toward a more sustainable future and help determine a set of short-term policies with measurable outcomes.



20-year goals:

1. Create 10,000 new cleantech jobs in the San Diego region
2. Generate 260 MW of renewable energy citywide (public and private properties)
3. Build/retrofit 50 million square feet of green buildings
4. Reach 10 percent net-zero-energy homes within the City
5. Divert 80 percent of trash from the landfill to recycling or conversion into energy
6. Ensure that 100 percent of public fleet vehicles run on alternative fuels and/or are zero-emission vehicles
7. Reduce water consumption within the City by 30 percent
8. Diversify the water-supply portfolio for the City of San Diego from two main sources to three or more (e.g. desalination, recycled water)
9. Support the development of vocational and educational programs to train a green-collar workforce for jobs in the cleantech industry
10. Plant 10,000 drought-resistant trees throughout the City to help abate GHG and reduce heat island effect.

To stimulate the growth of a new industry, local government has the ability to influence both supply and demand for cleantech products and ultimately spur economic development activity and job creation.

Supply and Demand for the Cleantechnology Market (Figure 1.0)

Policy Recommendations

With long-term economic and sustainable development goals in place, the City has identified a number of shorter-term policies to meet over the next five years. These policies will be reviewed, evaluated and updated annually to ensure constant progress and take into account new opportunities and challenges.

I. Policy Initiatives

A. Establish a Green Economy and Sustainable Development Working Group

Given the wide range of issues associated with fostering a cleantech sector and the linkage with environmental sustainability, the mayor has established a working group with broad representation from the private sector, academic and research institutions, the military and environmental/community groups.

The working group, which is composed of members from the local community, works with the Mayor to help guide the City's cleantech strategy. The working group provides input and advice to the city on the following initiatives:

- Determining long-term economic and sustainable development goals and policies
- Developing a green workforce strategy that supports the local cleantech industry
- Developing a plan to facilitate the commercialization and adoption of new clean technologies
- Increasing the flow of capital investment in the region
- Developing a cleantech branding and marketing strategy
- Collaborative opportunities in the cleantech arena

B. Ensure a Favorable Regulatory Climate for Cleantech Startups

The City is exploring ways to facilitate permitting and approval processes for cleantech projects and facilities, including:

- Conduct a citywide survey of light and heavy industrial zones to explore the viability of establishing an "overlay zone" for cleantech companies to help streamline local permitting requirements.
- Conduct a full assessment of existing City-owned parcels to determine if any are potentially suitable for cleantech companies.
- Examine various "lease-to-purchase" incentive models for City-owned assets that may benefit cleantech startups.
- Support cleantech-focused business plan competitions in partnership with local business schools and the organizations that assist cleantech businesses in the region.
- Strengthen the City's role in pursuing new strategic opportunities that will help grow a local cleantech cluster, such as the proposed California Institute for Climate Solutions and large U.S. government research/development awards that support the local development of cleantech innovations.

C. Advocate for the continuation of California's existing incentive programs

The Mayor will advocate for the continuation and expansion of existing government incentives that benefit the cleantech industry, including:

- tax credits for cleantech research and development activities
- manufacturing tax exemption for cleantech products
- expansion of Enterprise Zones, which offer tax benefits to companies located in economically depressed areas

The Mayor also will advocate for the creation of cleantech-targeted incentives that currently do not exist in California, such as special tax credits or reduction of sales tax for certain clean technologies (i.e., biodiesel).

II. Collaborations, Partnerships and Programs

To accelerate the adoption of solar power and energy efficiency technologies in San Diego, the City is in the process of implementing a financing program to reduce the upfront cost for the solar and energy efficiency retrofits for commercial and residential buildings:

The San Diego Clean Generation program

This program allows the city to create a financing district and offer low-interest, 20-year loans for solar panels, energy efficiency upgrades and water-efficiency measures for San Diego residents. The loan obligation will transfer with home ownership, removing a major barrier to installation of solar-energy systems. The financing program will cover all upfront costs after applicable tax credits and rebates, and will be available to all City residential and small commercial property owners.

The San Diego Clean Enterprise Program

The program provides interest-free financing for up to 10 years to fund energy-efficiency improvements for small businesses in the city of San Diego. Businesses can borrow up to \$50,000 to fund energy-efficiency improvements such as lighting retrofits, HVAC upgrades, water pumps and food-service equipment replacement. SDG&E will provide funding for the program, while CleanTECH San Diego will administer the program. The city will work with its departments to identify opportunities to promote the program to businesses that stand to benefit from the program.



Solar America Cities

San Diego was one of 25 U.S. cities selected by the U.S. Department of Energy for the Solar America Cities partnership, which provides some funding and support for programs to encourage adoption of solar energy by residents and businesses.

Current Solar America Cities project activities include:

- Updating and expanding geographic information system (GIS) analysis of solar installations and potential future sites
- Conducting performance analysis of approximately 12 MW of existing photovoltaic (PV) solar-electric systems
- Developing three case studies to explain the process for designing, planning, installing, and monitoring solar energy systems and provide energy and financial analyses
- Establishing four focus groups of key stakeholders to clarify the viability of installing solar energy systems
- Producing outreach materials to stimulate a robust project pipeline in San Diego.
- Developing a citywide solar implementation plan
- Studying the impact of solar energy installations on property resale and value

CleanTech Innovation Challenge

The Cleantech Innovation Challenge is a partnership between the City of San Diego, UC San Diego's William J. von Liebig Center for Entrepreneurism and San Diego State University (SDSU). In addition the City will work with its partners (UCSD, SDSU, SIO and USD). The program is designed to accelerate the commercialization of clean technologies out of university labs in order to promote the growth of the local clean tech industry.

Cleantech Business Incubator

Cleantech commercialization is capital intensive, requiring long incubation periods with typically lower returns on investment than innovation in biotech or telecommunication. Thus, anything that lowers the cost of business to allow early-stage cleantech companies to develop and grow technology will catalyze cluster development. The City is exploring potential collaborative partnerships with government entities and private corporations in setting aside lease space for startup companies, with possible sources of funding for this project may come from the American Recovery and Reinvestment Act grants. The City also will continue to work key stakeholders in the region, such as CleanTECH San Diego, CONNECT, universities and community-based organization on the potential establishment of Cleantech incubator infrastructure in the region.



Zoological Society Biomimicry Partnership

San Diego natural assets and local industries allow the City to position itself to become the hub for biomimicry. The City of San Diego and San Diego Zoological Society have created a partnership to develop a strategy to make San Diego the “Hub for Biomimicry Research & Development.

Green Workforce Training Program

The City of San Diego is the premier sponsor of SDSU’s new Online Green Industry Certificate Programs in Green Building Construction and in Renewable Energy and Green Energy Management. The City will continue to explore additional partnerships with organization such as: San Diego Workforce Partnership, Community Colleges, community-based organizations and regional cleantech companies. The primary goal of the partnerships is to establish a comprehensive framework for the development a green workforce training/educational infrastructure in San Diego. The partnership will help the region nurture and growth its local green workforce market, which is vital to attracting and retaining cleantech companies in the region and providing new sources of employment for the region.

A. KEY PARTNERS

CleanTECH San Diego



CleanTECH San Diego was created in 2007 as a nonprofit organization to accelerate San Diego as a world leader in the cleantech economy. Mayor Sanders and other city leaders played an active role in the creation of the group. Since its inception, CleanTECH San Diego has endeavored to stimulate innovation and advance the adoption of clean technologies and sustainable industry practices for the economic, environmental and social benefit of the greater San Diego region.

The group accomplishes this through a series of programs including education and outreach, policy advocacy and leadership opportunities. Many of these programs are partnerships with the City of San Diego, local research universities, and local cleantech businesses. CleanTECH San Diego’s membership includes business and financial leaders, academic and research institutes, and government and non-profit organizations.

San Diego Regional EDC



For more than 40 years, EDC has provided leadership by implementing strategies that set the San Diego region apart as a thriving center of technology and entrepreneurship, built upon informal networks, a knowledge-based economy, a culture of innovation and an unparalleled lifestyle. EDC’s business-development program aggressively targets inbound investment and provides significant resources to retain and assist local companies expand. The nonprofit’s business-development program also focuses on growing emerging and converging industries –sustainability, security, maritime and health care. Cleantech is a core area of EDC’s business development activity.

CONNECT

In 1985, with support from local business leaders, UCSD organized a program to educate the San Diego community on entrepreneurship and starting new technology-based companies. This initiative led to the establishment of

CONNECT as a regional nonprofit organization with member support from the research community, the private sector and government. CONNECT's purpose was to educate the San Diego region on how to commercialize local research-based discoveries. Today, CONNECT operates at the nexus of the regional innovation economy, connecting research institutions, angel, venture and institutional capital providers, R&D and business development arms of corporations, leading professional services providers and trade organizations together to accelerate the commercialization of innovation.

BIOCOM

BIOCOM is the largest regional life science association in the world, representing more than 550 member companies in Southern California.

The association focuses on initiatives that positively influence the region's life science community in the development and delivery of innovative products that improve health and quality of life. This includes initiatives in capital formation, public policy, workforce development, group purchasing and member services such as networking events. All of BIOCOM's efforts are aimed at positioning the Southern California life sciences community to achieve success in the development of products that improve global health and quality of life.

CommNexus

CommNexus San Diego, formerly the San Diego Telecom Council, is a nonprofit network of communications industry companies, defense industry companies, service providers, professional trade organizations, and local government. By introducing both national

and international markets to the emerging technologies in our region, CommNexus positions San Diego as a world center for innovation in communications technology. Their core programs and online services, which include over 50 networking and technical events per year and funding and business-development assistance to more than 100 companies annually, have formed a broad communications community in the San Diego region.

EvoNexus

EvoNexus is an incubator for early-stage high-tech companies in the San Diego area. The brainchild of San Diego high tech industry group, CommNexus, EvoNexus provides mentoring,

education, facilities, utilities and other services for start-up companies before they have achieved sustainability through revenues or private funding. Unlike many other incubators, EvoNexus participant companies will be under no financial or IP-licensing related obligations to EvoNexus when they graduate from the incubator. EvoNexus serves not only the companies accepted into the incubator, but also the San Diego high tech community at large. EvoNexus is a California nonprofit public benefit corporation supported through financial and in-kind donations.

San Diego Zoo's Institute for Conservation Research



The San Diego Zoo's Institute for Conservation Research is committed to generating, sharing, and applying scientific knowledge vital to the conservation of animals, plants and habitats worldwide. The San Diego Zoo has partnered with the City of San Diego to become the world's first biomimicry hub. They work with corporations to develop sustainable inventions that are inspired by nature and partner with academic institutions to teach biomimicry to students of all ages. Biomimicry is the science of taking inspiration from nature, its systems, processes and elements to solve design problems in a sustainable manner. The San Diego Zoo has one of the largest plant and animal collections in the world, a multidisciplinary set of scientific and behavioral expertise and world-class facilities. The institute seeks to unlock nature's secrets and solve real-world problems with answers that have already been developed in nature.

Foreign Trade Offices and International Chamber of Commerce



In April 2008, in partnership with Swedish American Chamber of Commerce, the City developed Entrepreneurial Days to explore trade opportunities between United States' and Sweden's cleantech industries. The goal of the partnership was to establish links between Swedish companies and our local cleantech sector in effort to simulate business transactions and cooperation between the regions. There are several foreign countries (Canada, UK, Japan, Australia, Germany, France and Switzerland) that have expressed an interest in establishing a similar business-cooperation forum. These partnerships could facilitate awareness of how to enter our market, establish business partnerships with local companies and expand their manufacturing operations to the region.

Glossary of Terms

Alternating Current (AC): Electricity characterized by the back-and-forth flow of current, in the United States at a frequency of 60 hertz.

Direct Current (DC): Electricity characterized by the unidirectional flow of current, as in batteries.

Inverter: Part of a solar electricity system that transforms direct current electricity into alternating-current electricity.

Kilowatt Hour (kWh): A measurement unit for electrical energy use.

Net Metering: An arrangement by which excess solar electricity produced by a customer's facility is supplied to the electrical utility grid, causing the customer's electric meter to spin backwards and generate credit to the customer's electric utility account.

Power Purchase Agreement (PPA): Long-term agreements between an energy provider and a customer to purchase power at pre-determined rates.

Photovoltaic (PV) Cell: The basic component of solar technology that converts solar power into electricity.

Renewable Electricity: Electricity generated without use of fossil fuels.

Solar Array: A grouping of multiple solar panels.

Solar Module: A grouping of photovoltaic cells into the building block for solar panels.

Solar Panel: A grouping of solar modules that become the main element in a solar electricity system. Solar panels are installed on rooftops or other open spaces that get full sunlight.

Biomass: Common name for organic materials used as renewable energy sources such as wood, plant material and waste.

Ultracapacitors: A capacitor that has far greater energy density and power per pound than electrostatic and electrolytic capacitors. Used in myriad electronic circuits as well as hybrid and electric cars. Also called “supercapacitors.”

Thermal Energy Storage: Technology that lowers the amount of electricity needed for comfort conditioning during utility peak-load periods. A building’s thermal energy storage system might, for example, use off-peak power to make ice or to chill water at night, later using the ice or chilled water in a power-saving cooling process during the day.

Biomimetic: Biomimetic refers to man-made processes, substances, devices or systems that imitate nature.

Smart Metering Infrastructure: Meters that provide utility customers real-time information about their energy consumption. Can include data on how much natural gas and electricity they are consuming, how much it is costing them and greenhouse gas emissions impact.

Low-Emission Vehicle: A vehicle that emits relatively low levels of air pollutants as compared to conventionally fueled vehicles.

Zero-Emission Vehicle: A vehicle which itself produces no emissions, such as electric-powered vehicles.

Ultra-filtration: A membrane-filtration technology which removes small colloids and large molecules from water and other liquids. This process falls between reverse osmosis and microfiltration in terms of the size of particles removed.

Waste Conversion: The process of converting waste byproducts into useful steam or steam-generated electricity.