CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: COMMUNITY & ECONOMIC DEVELOPMENT COMMITTEE

FROM: Paul Krutko

SUBJECT: Green Vision: Clean Tech Strategy

DATE: June 16, 2008

Approved [signature]

Date 6-12-08

COUNCIL DISTRICT: City-Wide

RECOMMENDATION

Acceptance of the progress report on San Jose's Clean Tech Strategy.

BACKGROUND

Cities around the world are adopting bold environmental goals and emission reduction targets in an effort to combat climate change; however, few entities to date have directly linked these efforts to economic development strategies. Many communities are still operating in the older paradigm of perceived trade-offs between environmental stewardship and economic growth. Further, few municipalities are putting policies in place to support the growth of the clean technology innovations that are critical to achieving long-term sustainability targets—San Jose is one of the few exceptions.

San Jose and Silicon Valley is rapidly emerging as a world center for the clean technology innovations that are necessary to face the growing climate crisis and meet unprecedented global energy needs. Local companies are creating innovative products that will harness the power of renewable energy sources, manage nature resources more efficiently, and reduce the environmental impacts of human activity. Through these efforts, the region is demonstrating that sustainability and economic opportunity are inextricably linked and transforming the vision of a clean economy into reality with the innovation, demonstration, and adoption of solutions that are critical to reducing greenhouse gas emissions worldwide.

To provide a road map for San Jose's journey towards a more sustainable future, the San Jose City Council unanimously adopted the "Green Vision" in October 2007 with the goals of spurring economic growth, enhancing the vibrancy of the community, reducing operating expenses, and displaying environmental leadership. Achieving the broad vision and specifically reaching each of the ten goals will require unprecedented innovation. New technologies will be required to help the community reduce energy consumption, utilize renewable power, convert

waste to energy, and adopt smart streetlights. As markets for new clean technology products develop, San Jose residents of all ability levels will have unparalleled opportunities to benefit from the multi-trillion dollar energy market as communities and companies around the world re-engineer the way they live, work, and play.

To transform San Jose's aspiration to emerge as a "World Center of Clean Technology Innovation" into a reality, the City, in partnership with the San Jose Redevelopment Agency, has developed a Clean Tech Strategy that provides a policy framework for developing the clean economy in the region and advancing key City priorities: job creation, revenue generation, and improvements to quality of life. This memorandum provides an overview of the elements of the strategy and highlights successes in the various initiative areas.

ANALYSIS

Reducing greenhouse gas emissions and conserving natural resources are critical to fighting the climate crisis and creating a sustainable future. The pending crisis also creates market opportunities that will dwarf the economic expansion experienced during the transition to the industrial age or the information age. As expert scientists and government officials around the world develop and adopt policies to reduce their communities' environmental impact, they are also creating markets for new products and incentives for companies that contribute to potential solutions. To date, San Jose is one of few entities around the world that has taken the next step of ensuring that its sustainability program creates opportunities in the local economy, rather than creating market inefficiencies.

While San Jose and Silicon Valley continue to enjoy traditional strategic advantages, such as a highly skilled workforce, world-class universities, entrepreneurial expertise, and access to venture funding, these advantages alone are unlikely to be sufficient to guarantee success. The competition for jobs will only increase as other states and nations attempt to lure innovative local companies with multi-million dollar incentives. The existing strengths of Silicon Valley will attract the attention of prospective companies, but forward-thinking City policies, dedicated resources and effort, aggressive advocacy at the state and federal levels, and a renewed focus on assisting companies at every stage of growth will be necessary to ensure long-term growth of the clean economy in San Jose.

San Jose's "Clean Tech Strategy" is built upon three fundamental tenants:

1. Environmental sustainability is good for the economy and will create more jobs and prosperity than is displaced

2. Clean technology is not simply as an emerging industry sector, but rather a mechanism to transform the entire global economy

3. The worldwide competition for clean technology jobs will be intense and success will require innovative policies and partnerships

The Clean Tech Strategy builds upon the City's Economic Development Strategy and provides a policy framework for achieving the Green Vision's economic goals by creating an environment where green companies can flourish.

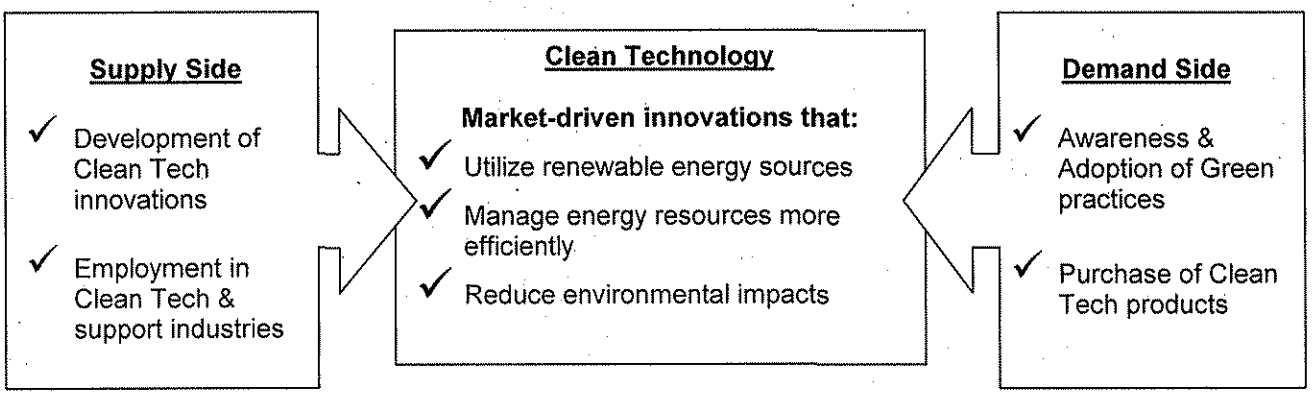
The Strategy focuses upon three goals that align directly with key City priorities:

1. Create 25,000 Clean Technology jobs, focusing upon well-paying jobs that cannot be outsourced

2. Position San Jose / Silicon Valley as "World Center of Clean Technology Innovation," a place where entrepreneurs from around the world come together to solve the greatest challenges facing our planet

3. Demonstrate to the world that the transition to a clean economy can spur economic growth, reduce operating expenses, and improve quality of life (inextricable linkage: green = jobs)

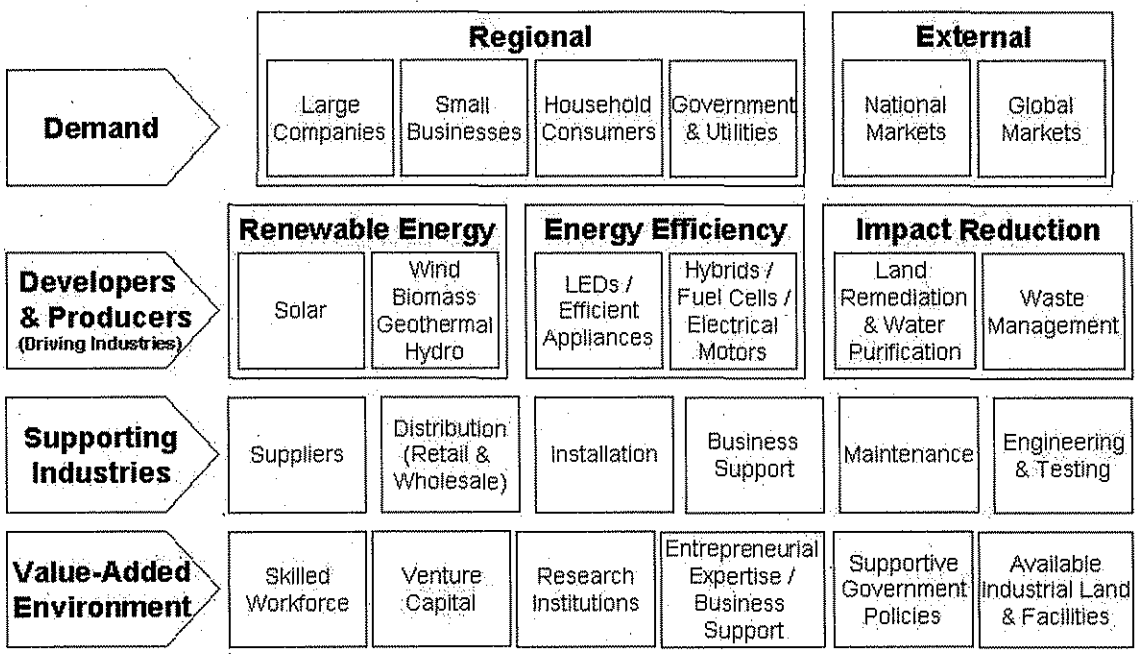
The foundational approach to achieving these three goals is to adopt a more holistic view of levers that the City can use to spur economic growth. That is, City government can influence both supply and demand factors to spur economic activity.



Much of the Green Vision lays out demand-side initiatives to change consumer behavior and expand San Jose's leadership as a place where government, residents, and the private sector work together to integrate cutting-edge technologies and adopt sustainable practices that will preserve our natural environment, enhance the vibrancy of our community, and grow our economy. To bolster the supply-side, the City must strive to provide services and adopt policies that add values for companies at every stage of their commercialization process and lay a foundation for industry growth by modernizing local, state, and federal policies and regulations.

In developing the Clean Tech Strategy, staff first evaluated the existing Silicon Valley ecosystem and its interplay with established and emerging local clean technology companies to better understand existing strengths and the evolving needs of these companies. The cluster analysis below shows how many of the unique competitive advantages of Silicon Valley will support the growth of the CleanTech industry, just as they have catalyzed waves of innovation in the semiconductor industry, computer hardware and software, internet innovation, biotechnology, nanotechnology, and informatics.

Clean Technology Cluster Analysis



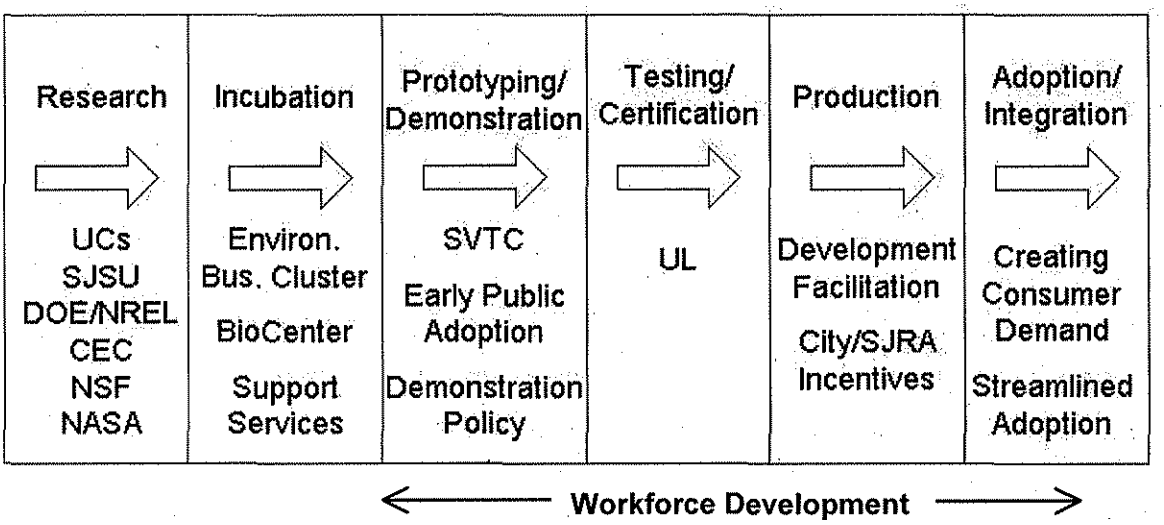
The preliminary cluster analysis highlights various strengths of the region, which has helped inform which types of clean technology innovation are most likely to flourish in San Jose and focus staff efforts on high-impact target areas. High land and labor costs make some clean technology products and processes impractical, however other technologies that require the region's expertise in bioscience, informatics, and nanotechnology are a perfect fit for growth in this market. As such, the City has identified three key areas of focus:

1. Renewable Energy: solar, fuel cell
2. Green Building: energy efficiency, control systems, LED lighting, materials
3. Transportation: alternative fuels, mass-transit, smart infrastructure

While the cluster analysis rapidly showed that most of the elements were in place to spur the growth of clean technology companies in these three areas, it also suggests that the City and Redevelopment Agency have the potential to play a larger role in facilitating the relationships necessary to commercialize products and expand the areas where San Jose could add value to local companies. Compared to many other technologies, the clean technology commercialization cycle is more capital intensive, requires longer incubation periods, and typically produces lower returns on investment that innovations in semiconductors or internet start ups. These differences necessitate a more aggressive approach to development and greater strategic investment in companies as they develop.

This expanded approach, or "integrated model" of facilitation, calls for supporting companies at every stage of the commercialization process and creating seamless transitions as they grow. This model, developed in collaboration with the Redevelopment Agency and the Environmental Business Cluster, attempts to tie together the traditional strengths of Silicon Valley and improve upon areas of opportunity.

Integrated Model for Clean Tech Development



San Jose and the Redevelopment Agency have traditionally excelled at incubation and facilitating development, yet the integrated model expands the traditional role into areas not typically embarked upon by municipal governments. As companies transition between development stages, they are often making other key decisions, such as location and rate of expansion. Developing long-term relationships with companies and meeting their needs at all stages will enhance the existing retention and attraction efforts. Underpinning San Jose's Clean Tech Strategy is the need to prepare the local workforce to seize the coming opportunities and ensure that companies can find the talent they need to succeed.

In addition to the components of the integrated model, San Jose is also aggressively promoting changes in consumer behavior and pursuing partnerships and legislative policies changes that are necessary to ensure long-term economic growth. The next section will briefly describe the City and Redevelopment Agency efforts in each element of the Clean Tech Strategy and highlight recent successes.

Components of Strategy / Recent Successes

Research Collaboration: Many of the top scientists and engineers in the Bay Area are conducting the foundational research necessary for clean technology breakthroughs. Traditionally, City involvement with these top scientists has been limited to interactions with the incubator programs. A key element of the Green Vision's long-term success is ensuring that local innovation turns into local economic opportunity. To expand the relationships with area universities and colleges, San Jose's successful application to host SolarTech included newly formed partnerships with NASA-Ames Research Park, UC-Santa Cruz's Bio | Info | Nano Research & Development Institute (BIN-RDI), UC-Merced, San Jose State University, Carnegie Mellon University-West, Foothill-De Anza College Community College District, San Jose City College-Evergreen Community College District, and Santa Clara University. Each of these entities offers different strengths that will advance the goal of transforming San Jose/Silicon Valley into a center of clean technology innovation and employment. In addition, the City's

designations as a U.S. Department of Energy Solar America Showcase and Solar City have created valuable partnerships with some of the nation's leading experts in renewable energy at Sandia National Laboratories and elsewhere. These relationships connect San Jose with cutting-edge research and create opportunities to attract the most innovative companies in the nation.

Incubate Innovation: Venture capital investment in clean technology has exploded over the past two years. In 2007, Silicon Valley companies received more than $1.1 billion of investment, which represented 62% of all clean technology investment in California and 21% of the total investment across the nation. As local companies receive substantial financial support from public and private financiers, San Jose's ability to foster early stage growth is critical to ensuring that companies locate in the region. Fortunately, San Jose has a long history of incubating the types of substantial innovations and new products that are necessary to achieve the Green Vision. The San Jose Environmental Business Cluster (EBC) is recognized as the best clean technology incubator in the nation and provides support for start-up companies, including entrepreneurial expertise, access to financial and legal services, and administrative support, as they commercialize the technologies of tomorrow. The national reputation of the EBC provides opportunities to attract and retain top entrepreneurs from around the country. Staff is constantly evaluating ways to improve the attraction and retention efforts in partnership with the EBC's leadership team.

The interconnected applications of advanced life science research at the San Jose BioCenter are also leading to innovative clean technology products and multiple participants are currently working on commercializing technologies with environmental benefits. To spur innovation in clean transportation, the Redevelopment Agency has invested in establishing an Electronic Transportation Development Center (ETDC), which focuses on integrating Silicon Valley technologies into mass-transit vehicles and is establishing the key private partnerships to ensure the initiative's success.

In addition, San Jose has also formed a strategic partnership with the California Clean Tech Open, an organization dedicated to creating economic growth and environmental sustainability by supporting the growth of clean technology companies across California. Several winners of the Clean Tech Open have come out of San Jose's EBC. The organization was recruited to bring their world-class commercialization competition to San Jose, which hosted the successful launch of the 2008 competition at City Hall in April. Participating in this premier event connects San Jose with many of the leading clean technology entrepreneurs in the nation, creating substantial recruitment opportunities. Staff is working closely with the organization's leadership to provide innovation workshops and develop the awards ceremony scheduled for the fall.

***Prototyping / Demonstration*:** Commercializing clean technology innovations requires greater investment and support than many other types of technology. While a website can demonstrate a proof of concept in a cubicle, a solar thermal innovation may require several acres of land to demonstrate viability. Through the development of the Clean Tech Strategy, this critical gap in the commercialization process was identified as an important attraction and retention opportunity for the City. On June 3rd, the City Council unanimously adopted a Demonstration Program Policy to allow the City to provide land or access to facilities to test next-generation technologies that have not been fully commercialized. Many of these technologies have the potential benefit to the City's operations and advance the Green Vision. This innovative policy will allow the

City to help cutting-edge companies conduct the research and development for the world, beginning in San Jose. Initial projects are likely to include testing a range of solar products, energy efficiency and monitoring technologies, and the numerous innovations necessary for the Green Mobility Showcase.

In addition to the demonstration opportunities provided by the City, the Redevelopment Agency and Office of Economic Development have worked closely with companies that provide services that are integral to product development. One challenge for clean technology companies trying to move from one functioning prototype to a pilot manufacturing line is the high capital costs of equipment and process development expertise to expand production. For this reason, San Jose aggressively sought to ensure that SVTC create their proposed Photovoltaic Development Center in Silicon Valley. As an established leader in Development Foundry Services, SVTC is focusing on the demand for renewable energy generation and recognizing the relationship between semiconductor processing and photovoltaic processing, SVTC is creating the Silicon Valley Photovoltaic Development Center. This new center will provide photovoltaic development services that create value for both existing and start-up solar companies, providing them with real time-to-market advantages and reduced costs for their development efforts. SVTC will create strong synergy for the existing solar companies present in Edenvale and supports the efforts to grow San Jose's solar industry cluster.

***Testing / Certification*:** One key challenge for growing the national solar market is getting tested products to market. The primary location for testing solar panels is on the Arizona State University campus. Due to overwhelming demand, the testing process can take more than a year at the ASU facility, which substantially delays time to market. To remedy this delay in the commercialization process, San Jose partnered with the Silicon Valley Leadership Group, SolarTech and Pacific Gas & Electric, to attract Underwriters Laboratory to attract the largest private solar testing facility in North America to North San Jose. The facility, scheduled to open in July 2008, will test and certify a wide range of solar innovations, including photovoltaic, thin film, thermal concentrator, and concentrated photovoltaic technology, in an effort to get products to market more efficiently.

Staff is beginning the conversation with other clean technology companies to determine if similar delays exist in the commercialization cycles of other technologies.

Workforce Development: San Jose's greatest asset in competing for jobs is the region's access to a talented workforce and experienced entrepreneurs. Through the San Jose's Workforce Investment Board work2future, San Jose is providing job-training opportunities for residents to ensure that clean tech companies can find the talent they need to succeed at all stages of development. Clean technology jobs will present a diverse range of employment opportunities in research and development, business support, manufacturing and assembly, distribution, installation, and maintenance. Unlike previous waves of innovation, many of these jobs will provide solid middle-class wages in occupations that are unlikely to be outsourced. For example, a single solar panel creates jobs in research and development, production, distribution, installation, monitoring, and maintenance, creating a wide-range of job opportunities for individuals with different skill sets and educational backgrounds.

San Jose is a national leader in creating workforce development programs that will ensure that local residents have the skills they need to seize emerging Clean Tech employment opportunities. Local community colleges are partnering with local workforce investment boards and industry leaders to develop curricula and train workers for employment with solar companies. Recently, San Jose's work2future program partnered with a local solar thin-film company to become the first Workforce Investment Board in California to receive State Employment Training Panel funds to train individuals to work in Clean Tech jobs.

As part of the workforce strategy, San Jose will focus initially on providing employees for companies that are already located in San Jose and early-stage companies with substantial growth potential. Companies that do not begin in Silicon Valley are unlikely to locate manufacturing operations to the region, because of high production costs; however, access to talent and proximity to customers, increase the potential for the creation of production jobs in San Jose by companies that begin to grow locally. San Jose anticipates early workforce growth in research and development will lead to a broader spectrum of jobs in the long-term.

Facilitating Development/Production: Over the past five years, San Jose has succeeded in attracting and retaining world-class companies with innovative programs and policies, such as the Special Tenant Improvement Program, the Industrial Tool Installation Program and the Emerging Technology Fund, Extraordinary Economic Opportunity Fund, Catalyst Fund, Enterprise Zone Credits, site selection assistance, and workforce development support. Strong collaboration between the Office of Economic Development and the Redevelopment Agency has already helped more than a dozen clean technology companies grow or relocate in San Jose.

Diverse companies such as Nanosolar, Solopower, Stion, Bay Biodiesel, BioFuel Box, Sympagis, Underwriters Laboratory, SVTC, Borgata Recycling, Green Waste, and Fat Spaniel, representing a wide-range of technologies, are leading the way towards the creation of 25,000 clean technology jobs. The City is also with working with several additional companies such as SunPower, Phillips Lumileds, Echelon, and Dinyari, to ensure that they continue to grow in San Jose. Through these efforts, the City estimates that more than 2,000 clean technology jobs are currently located in San Jose. In addition, staff is in ongoing conversations with dozens of companies from around the nation and multiple companies abroad to attract them to San Jose.

Consumer Adoption: The environmental conscientiousness of California residents along with San Jose's Green Vision goals create demand for many new products and innovative clean technology solutions. While many of these technology have broad application for governments, residents and businesses, the City must lead by example by demonstrating clean technology products, such as solar on City facilities, for other potential consumers and encourage private sector adoption products and sustainable practices. Innovative approaches like the Mayor's Solar Challenge can help drive consumer demand, while engaging the local companies to provide cost-effective solutions for residents. Simultaneously, the City must strive to modernize policies to eliminate bureaucratic obstacles to consumer adoption of various products.

Legislative Advocacy: The State of California has been a national leader in the adoption of bold environmental goals and regulations. California's "Global Warming Solutions Act of 1996" (Assembly Bill 32), the Renewable Portfolio Standard, and the California Solar Initiative have each create substantial demand for clean technology products and services; however, to date, no

policies have been adopted to ensure that the products and jobs required to satisfy these demand-side policies are created in California. In March, the San Jose City Council adopted the "2008-2009 Clean Tech Legislative Agenda," which provides a series of guiding principles and specific policy recommendations for the federal, state, and local levels that are necessary to create an environment where clean technology companies can flourish and off-set the traditional disadvantages of producing products in California. Success will require both the advocacy of proposed legislation that advances these goals as well as the development of new legislation for federal and state for consideration.

To advance key clean technology legislative goals, San Jose has formed strategic partnerships with the Silicon Valley Leadership Group, TechNet, and the Solar Energy Industry Association to identify key areas for collaboration and joint advocacy. To date, much of this effort has focused on the Federal Renewable Energy Tax Credits, specifically the Production and Investment Tax Credits, that are vital to the solar, wind, and fuel cell industries. Staff anticipates working closely with these advocacy organizations and additional industry partners in FY 2008-2009 to develop potential State legislation to compliment AB32, which focuses specifically upon creating local economic opportunity as California reduces greenhouse gas emissions by 80% of 1990 levels by 2050. At the local level, staff is working closely with industry leaders to remove barriers and streamline the adoption of solar energy, wind power, and green building practices.

Partnerships/Regional Collaboration: San Jose is aggressively developing partnerships with organizations to catalyze the growth of the clean tech industry in San Jose. San Jose has already engaged in partnerships with industry leaders, venture capitalists, and several key organizations, such as Joint Venture Silicon Valley, Silicon Valley Leadership Group, SolarTech, San Jose State University, Valley Transit Authority, PG&E, and Silicon Valley Power.

The potential for partnerships to support the clean technology goals of the City is well demonstrated by the recent involvement with SolarTech, an industry collaborative including leading solar companies (producers, integrators, monitoring companies), power utilities, and local governments. San Jose was recently selected as home to SolarTech, a collaborative effort led by Silicon Valley Leadership Group that is looking to create a "Silicon Valley Solar Center of Excellence." Similar to the successful SEMATECH model, which facilitated growth of the semiconductor industry, SolarTech is seeking to catalyze the growth of the solar industry in Silicon Valley and reduce the cost of solar for consumers by developing standards for performance, installations, utility interconnections and rebate processes, building permits, education/workforce training, and financing. SolarTech will initially co-locate with San Jose's work2future Workforce Investment Board at 1290 Parkmoor Avenue.

EVALUATION AND FOLLOW-UP

Staff will provide updates about many of the initiatives and projects discussed within this memorandum as appropriate to the Community & Economic Development Committee or Transportation & Environment Committee. In addition, staff will provide a comprehensive progress report on the Green Vision to the full Council in early 2008.

COORDINATION

Preparation of the memorandum was coordinated with the San Jose Redevelopment Agency and the Environmental Services Department.

PAUL KRUTKO
Chief Development Officer

For questions please contact Collin O'Mara at 408-535-8169.