
CALIFORNIA: LOW CARBON LEADER



BUSINESS & JOB GROWTH
OPPORTUNITIES

SUMMARY EXECUTIVE

California is poised to lead in the battle to stop global warming. To do so, the state must continue its multi-decade commitment of promoting efficiency, cleaner technologies, and renewable energy, and pursue a host of new emission reduction measures, including those outlined in the California Climate Action Team Report (CAT report).

What will the impact of these combined measures have on the California economy? To answer this question, The Climate Group reviewed studies documenting benefits California has already recouped from its 20-year investment in energy efficiency, research demonstrating increases in venture capital investment in California's clean technology sector, economic experts' analyses of measures proposed in the CAT report, and market trends that document state-wide growth in renewable energy and other businesses. The results clearly suggest that state action to address climate change will boost state-wide economic growth and position California to lead the worldwide expansion of clean energy and clean technology businesses.

AMONG THE CLIMATE GROUP'S KEY FINDINGS ARE:

As many as 83,000 new jobs can be created by 2020 through implementation of the Climate Action Team report.

Full implementation by 2020 will likely result in positive cost savings to Californians ranging from \$2.5 to \$59 billion.

Venture capital investors put more than \$1.6 billion in the North American clean tech sector in 2005, an increase of 34% over 2004. California companies received one-third of this venture capital.

State supported energy efficiency, clean technology and renewable energy policies currently in place have already:

- stimulated California export sales of energy efficiency, renewable energy, and clean energy technologies
- brought over 33 new clean energy and energy efficiency products to the marketplace
- saved California businesses and consumers over \$56 billion.

KEY FINDINGS

RANGE OF CALIFORNIA JOB GROWTH FROM IMPLEMENTATION OF CLIMATE ACTION TEAM REPORT BY 2020:

20,000 – 83,000

RANGE OF COST SAVINGS FROM IMPLEMENTATION OF CLIMATE ACTION TEAM REPORT BY 2020:

\$2.5 – \$59 BILLION

VENTURE CAPITAL INVESTED IN CALIFORNIA CLEAN TECHNOLOGY IN 2005:

\$523 MILLION

PERCENTAGE THIS REPRESENTS OF NORTH AMERICAN TOTAL:

33%

RANKING OF CLEAN TECH SECTOR AMONG TOTAL NORTH AMERICAN VENTURE CAPITAL:

5TH

CALIFORNIA SHARE OF U.S. WIND, SOLAR THERMAL AND SOLAR PHOTOVOLTAIC PATENTS:

18%, 23% & 15%

SAVINGS FROM CALIFORNIA BUILDING AND APPLIANCE STANDARDS THROUGH 2003:

\$56 BILLION

RANGE OF ADDITIONAL SAVINGS FROM CALIFORNIA BUILDING AND APPLIANCE STANDARDS BY 2013:

\$43 TO \$57 BILLION

WORLDWIDE MARKET OPPORTUNITY FOR BIOFUELS, WIND POWER, SOLAR PHOTOVOLTAIC, AND FUEL CELLS BY 2015:

\$167 BILLION

RANK OF CALIFORNIA TO RESPOND TO OPPORTUNITY AMONG 50 US STATES:

1

AMOUNT PLEDGED BY STATE'S TWO LARGEST PENSION FUNDS FOR INVESTING IN CLEAN TECHNOLOGY COMPANIES:

\$450 MILLION

ESTIMATED NUMBER OF CALIFORNIA JOBS THAT \$500 MILLION INVESTMENT WILL CREATE:

10,000

NUMBER OF CLEAN ENERGY PRODUCTS BROUGHT TO MARKETPLACE BY STATE-FUNDED RESEARCH GRANTS (2000-03):

33

VALUE OF CALIFORNIA EXPORT SALES OF ENERGY EFFICIENCY, RENEWABLE ENERGY AND CLEAN ENERGY TECHNOLOGIES STIMULATED BY STATE ENERGY TECHNOLOGY EXPORT PROGRAM:

\$500 MILLION

MARKET TRENDS

01: MARKET TRENDS

A review of current trends confirms that clean energy and technology markets are expanding worldwide. California businesses are well positioned to lead in responding to this demand. Venture capital investment in clean energy and technologies is also growing and California businesses are a primary beneficiary.

- By 2015, four clean energy markets – biofuels, wind power, solar photovoltaics, and fuel cells – will grow fourfold from their current market of \$40 billion to \$167 billion.¹
- Three solar companies were the highest demand US IPO's in the last quarter of 2005, combined they raised over \$800 million.²
- Clean tech market watchers forecast that ethanol and biodiesel companies could fuel the next wave of clean-energy IPOs.³
- California's share of clean tech patents exceeds overall U.S. patent trends. Californians hold 18.1% of U.S. wind technology patents, 14.2% in solar water heating, 22.9% in solar thermal electricity, and 14.5% of patents in solar photovoltaics.⁴
- Large investors are beginning to view climate change as a fiduciary duty, Goldman Sachs is investing \$1 billion in energy from sources other than oil and gas and supports policies that create long-term value for emissions reductions.
- CalPERS and CalSTRS, California's two largest pension funds, have already allocated \$450 million in investments for clean technology development.

ECONOMIC ANALYSIS

02: ECONOMIC ANALYSIS

California has a multi-decade history of incentives and investment in energy efficiency, clean technologies, and renewable energy. As of 2003 consumer and business cost savings from state mandated building and appliance standards had already reached \$56 billion.⁵ Three independent economic analyses conclude that the Climate Action Team's blueprint of existing and proposed measures will result in state-wide job growth and additional cost savings.

- Analysis conducted by the state agencies in the Climate Action Team estimates that full implementation of the report will produce 83,000 jobs by 2020 and add \$4 billion in additional income to Californians.⁶
- Economists from UC Berkeley found that implementation of just eight of the CAT Report policies would increase the Gross State Product by \$59 billion, create 20,000 new jobs, and achieve almost half of the Governor's 2020 emissions reduction target.⁷
- An assessment by the Center for Clean Air Policy concluded that nearly 90% of the 2020 target can be met with consumers gaining cost-savings of \$2.5 billion in reduced gasoline and energy bills.⁸

BUSINESS EXAMPLES

03: BUSINESS EXAMPLES

California businesses are responding to climate change with actions that cut costs, improve competitiveness, and expand market share. Many California businesses have reduced operating costs and achieved significant cost savings from emissions reduction measures directed internally. Other businesses and investors are responding to and reaping the benefits from the growing worldwide demand for cleaner energy and technologies.

- California companies, for example Johnson & Johnson's LifeScan, Gap, and Cisco Systems, have set internal emissions reduction targets and made cost-saving energy efficiency improvements. LifeScan's actions cut emissions over 22% and saved over \$5 million, Gap is saving \$1.6 million a year, and Cisco Systems' savings from emissions reduction are \$5.75 million annually.⁹
- Hewlett-Packard and Intel are designing and manufacturing state of the art energy-efficient computers and other hardware, significantly reducing the electricity demand and resulting emissions from their products.¹⁰
- The largest IPO in the last quarter of 2005 was for Sunnyvale-based SunPower, which by the end of its first trading day had market capitalization exceeding \$1.5 billion.¹¹
- Bill Gate's firm Cascade Investment recently acquired a major stake in California-based Pacific Ethanol, investing \$84 million. The company's share price doubled in the first two months of 2006.¹²
- In February 2006, BP and Edison Mission Group (EMG), announced plans to build a \$1 billion hydrogen-fueled power plant in Carson, California. The plant will produce 500MW of low-carbon generation – serving 325,000 homes – and will create 150 permanent and 1000 temporary construction jobs.

GLOBAL EXPERIENCE

04: EXPERIENCE FROM ABROAD SUBSTANTIATES ECONOMIC BENEFITS

Governments worldwide are implementing regulations to reduce global warming emissions and making investments to stimulate clean technology and renewable energy sectors. With mandates, incentives, and long-term horizons renewable energy policies in particular are sending the right market signals. Experiences outside the US document job growth and business expansion stimulated by government initiated climate protection policies.

- Policies enacted by the German government have spurred the creation of 70,000 new jobs in the renewable energy sector between 2000 and 2005. By 2020, Germany expects investment in renewable energy to increase to \$306 billion per year, an increase of five times the current level and an investment likely to result in the creation of an additional 100,000 jobs.¹³
- In 2005, China approved a target to produce 15% of China's power from clean energy by 2020. This will require a twelve-fold increase in renewable energy capacity by 2020¹⁴ and investments of up to \$184 billion.¹⁵ China's action has already spurred business opportunities for Californian companies. A solar cell designed by California based SunPower is now being manufactured in China.

CONCLUSION

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The Climate Group is a global leadership coalition with a positive message regarding the economic benefits of reducing greenhouse gas emission and the business case to substantiate this message. This review adds to the growing documentation of climate protection as economic opportunity.

California faces an unprecedented window of opportunity to make clean technologies available to the rest of the world and to share its expertise in addressing this urgent global problem.

Market signals such as those proposed in the California Climate Action Team Report can spur innovation. State policies to minimize global warming pollution can unleash California's world-famous innovative spirit and enable the state and its businesses to lead and benefit from the increased worldwide demand for clean energy and clean technology. In sum, California's actions to protect our global climate are good news for business and for California's economy.

The Climate Group joins with others who believe that greenhouse gas emissions can be substantially reduced at a profit rather than a cost.¹⁶

INTRODUCTION: AVERTING GLOBAL WARMING CAN BENEFIT CALIFORNIA'S ECONOMY

Whether actions taken to respond to climate change are economically damaging or economically productive is hotly debated. This report by The Climate Group is a review of economic studies, current market trends, and business examples. The results establish that actions by California businesses and governmental agencies are contributing to the growth of a productive and thriving low carbon economy.

Measures outlined in the Governor's Climate Action Team report, a host of new legislation and the combined effects of California's multi-decade commitment to energy efficiency, cleaner technologies and renewable energy has California poised to lead in the battle to avert global warming. This is good news for California businesses and for the economy.

While many businesses have taken on reducing greenhouse gas emissions, data indicates that governmental policies are a necessary stimulus to spur the transition to a low carbon economy. A 2004 survey of 25 private equity investors identified that focused public policy can create new markets and attract private investment. Among the investors surveyed, 91 percent expressed that environmental public policy helped drive new business and investment, with 79 percent indicating that California's programs and incentives were a prominent factor in their preference to invest in California.¹⁷

California is the world's seventh largest economy and the largest economy of all of the fifty U.S. states. California achieves this economic ranking with relatively low per capita energy consumption – it ranks 48th out of the 50 in the amount of energy consumed per person.¹⁸ The energy efficiency behind that statistic is the direct result of state policies and programs. It helps make California's economy one of the strongest in the world and provides the state with unique economic advantages.

California's energy efficiency regulations set benchmarks for the country and from the mid-seventies to the end of the 1990's had already saved California businesses and consumers more than \$50 billion in electricity and natural gas expenditures. State appliance standards and energy efficient building codes will by 2011 provide an additional \$57 billion in energy efficiency cost-savings.¹⁹ These existing measures plus new ones proposed in the climate action plan can achieve "carbon reductions sufficient to meet the Governors targets... at no net cost to consumers and likely at a net benefit in both 2010 and 2020."²⁰

As a leadership coalition with a positive economic message and the business cases to substantiate economic benefits from greenhouse gas

emissions reduction, The Climate Group adds this publication to the growing documentation of climate protection as economic opportunity. We join with others who believe that greenhouse gas emissions can be substantially reduced at a profit rather than a cost.²¹

BACKGROUND: CALIFORNIA'S CLIMATE ACTIONS

In June 2005, Governor Schwarzenegger signed Executive Order S-3-05 establishing the following GHG emission reduction targets for California:

- by 2010, reduce GHG emissions to 2000 levels
- by 2020, reduce GHG emissions to 1990 levels; and,
- by 2050, reduce GHG emissions to 80 percent below 1990 levels

Between June 2005 and March 2006, the California Environmental Protection Agency (CalEPA) led a multi-interagency Climate Action Team to produce the California Climate Action Team report (CAT Report). The report is a blueprint of proposed and ongoing actions directed toward meeting the Governor's targets and lowering global warming emissions throughout the state. In addition to new strategies, the CAT Report summarizes existing state actions such as state-funded economic incentives for energy efficiency, the recent million solar roofs incentives passed by the Public Utilities Commission, and the vehicle emission rules that are the first in the world to lower the global warming pollution from our cars' tailpipes.

The CAT Report outlines 46 specific proposed and existing strategies, including investments and programmatic initiatives in areas such as energy efficiency, renewable energy, cleaner cars and fuels, improved waste management and transportation systems, and forest and water conservation measures. The report also includes nine key recommendations to help ensure the Governor's targets are met, including:

- Development of a multi-sector, market-based program that includes consideration of emissions trading, emission credits, auction and offsets
- Mandatory greenhouse gas emission reporting for large sources, including oil and gas extraction facilities, oil refineries, power plants, cement manufacturing plants, and solid waste landfills
- Require new electricity generated for use in California to come from sources with climate change emissions equivalent to or less than new combined cycle natural gas power plants
- Require all utilities, whether publicly or privately owned, to meet the state's energy efficiency goals and Renewable Portfolio Standard
- Coordinate the state's investment strategies to develop technologies in California that will reduce greenhouse gas emissions

The CAT Report asserts that Governor Arnold Schwarzenegger's goals for reducing greenhouse gas emissions are achievable and beneficial to California's economy. To answer the question of whether California's actions will benefit or hurt the state's economy The Climate Group reviewed studies documenting the benefits California has already recouped from its 20 year investment in energy efficiency, research demonstrating recent increases in venture capital investment in California's clean energy and clean technology sector, economic experts analysis of measures proposed in the Climate Action plan, and reports that document state-wide growth in renewable energy and other businesses.

MARKET TRENDS: GROWTH IN CLEAN ENERGY AND CLEAN TECHNOLOGY BUSINESS ACTIVITY

Globally, wind and solar markets reached \$11.8 and \$11.2 billion in 2005 – up 47% and 55%, respectively in just one year. The market for biofuels also hit \$15.7 billion in 2005, up more than 15% from the previous year.²² These three clean energy markets – plus fuel cells – are expected to grow fourfold and reach \$167 billion by 2015. Over the next decade, these new sectors will offer unprecedented opportunities for both new businesses and the more than 175 companies in California that are already exporting renewable energy products and services overseas.²³

California is well positioned to lead the pack in business and job growth in these sectors as a recent survey of US venture capital firms labeled California as the most attractive region in North America for clean technology/clean energy investment.²⁴ Early adapters to the expanding clean technology market, by 2003 California companies were already receiving 29% of the total clean tech venture capital invested throughout North America. And venture capital in this sector has been growing substantially.

A record \$5.2 billion in venture capital was invested in clean tech throughout North America during the fourth quarter of 2005, a 59.8% increase over the fourth quarter of 2004.²⁵ Venture investors have put more than \$1.6 billion in the clean tech sector in 2005, an increase of 34% over the amount invested in 2004.²⁶ California was a significant beneficiary, between January and October of 2005 new clean technology companies within California received \$523 million, just under one-third of the total North American investment.²⁷ Silicon Valley venture firms that financed the Internet and wireless telecom revolutions – Draper Fisher Jurvetson; Kleiner Perkins Caufeld & Byers; Mohr, Davidow Ventures; and VantagePoint Venture Partners – are some of the investors betting big on clean-energy.²⁸

Fueling much of this business growth is the perspective by a growing number of Fortune 500 companies that addressing climate change equals business opportunity. GE for example decided to double its annual R&D on clean technology to \$1.5 billion, with GE CEO Jeff Immelt stating “I am not tackling climate concerns because it's moral or trendy... The biggest driver for me is business potential: It will accelerate economic growth.” Goldman Sachs is investing \$1 billion in energy from sources other than oil and gas and supports policies that create long-term value for emissions reductions.

Among the recommendations in the CAT Report is a coordinated investment strategy among the state's large institutional investors to stimulate business development in clean energy and clean technology sectors. This proposal builds on the Green Wave program initiated by CalPERS and CalSTRS. Through Green Wave the state's two largest pension funds have already allocated \$450 million in investments in clean technologies. Analysis by the California Energy Commission estimates that \$500 million in investment can stimulate the creation of 10,000 new jobs.

California already has in place a state funded energy technology export program for energy efficiency, renewable energy and clean energy technologies. Research by the California Energy Commission puts the value of California export sales of technologies supported by this program at \$500 million.

Additional business trends identified by The Climate Group:

Companies are setting internal global warming emissions reduction targets, implementing actions to meet the targets and achieving significant cost-savings. Among California companies:

- Disney is saving \$2.3 million annually through building performance and efficiency improvements
- Gap is saving \$1.6 million annually
- Qualcomm is saving \$1.4 million annually
- Cisco is saving \$5.75 million annually
- Intel is saving more than \$10 million annually

Southern California Edison has become the nation's largest wind retailer.²⁹

California-based SunPower was the largest technology IPO during the last quarter of 2005, by the end of its first trading day market capitalization had exceeded \$1.5 billion.³⁰

Bill Gate's firm Cascade Investment recently acquired a major stake in California-based Pacific Ethanol, investing \$84 million. The company's share price doubled in the first two months of 2006.³¹ Market watchers believe that ethanol and biodiesel companies could fuel the next wave of clean-energy IPOs.³²

ECONOMIC ANALYSES OF STATE CLIMATE ACTIONS

Economic analyses and cost saving studies have examined the energy efficiency, clean energy market development and similar actions currently in place within the state. More recently, three independent economic analyses of the strategies proposed in the CAT Report were also completed. Review of both past studies and the recent analyses reveals unanimity in the conclusion that there are state-wide economic benefits from implementation of climate protection actions. The following is a summary of the different studies and reports reviewed by The Climate Group.

UC BERKELEY ECONOMISTS ANALYSIS

UC Berkeley Agriculture and Resource Economics Professor David Roland-Holst used a new economy-wide forecasting model known as “BEAR” to simulate the economic consequences of the energy policy scenarios described in the CAT Report. His team found that the “aggregate economic benefits of many GHG mitigation policies outweigh their microeconomic costs.”³³ The UC Berkeley team found that:

- Eight policy areas – building efficiency, vehicle emission standards, HFC reductions, manure management, semiconductors, landfill management, afforestation and cement manufacturing process changes – can achieve almost half of the Governor’s 2020 target, while simultaneously increasing the Gross State Product by \$59 billion and creating 20,000 new jobs. Most of the increase in GSP would be the result of cost savings to consumers from vehicle and building efficiency measures.³⁴

The UC Berkeley economists report includes documentation on California’s share of clean tech patents. They found that California holds 18.1% of U.S. wind technology patents, 14.2% in solar water heating, 22.9% in solar thermal electricity, and 14.5% of patents in solar photovoltaics.³⁵

STATE CLIMATE ACTION TEAM ECONOMIC ANALYSIS

State economists used a general equilibrium model of the California economy, called “E-DRAM”, to analyze the CAT report. Their analysis estimates that:

- Full implementation of the plan will likely produce 83,000 jobs in 2020 and add \$4 billion in additional income to Californians, beyond what the economy would produce without the strategies. Within four years, their findings also indicate plan implementation is likely to generate \$2 billion in extra income and 19,000 new jobs for Californians.³⁶
- Net economic savings would be \$1.6 billion in 2010 and \$9 billion in 2020.³⁷

CENTER FOR CLEAN AIR POLICY

The Center for Clean Air Policy’s (CCAP) 2006 study was used to inform the work of the California Energy Commission, one of the agencies contributing to the CAT Report. CCAP reviewed potential and existing emission reductions in five key sectors – agriculture/forestry, cement, methane, transportation and high global warming potential gases (HFCs, PFCs and SF₆). CCAP found that:

- About 87% of the Governor’s reduction targets can be achieved in 2010 and 2020 with measures drawn from the 5 key sectors. The estimated cost of implementing the measures would be offset by savings specifically from vehicle emissions and building efficiency measures.
- Net economic savings from the measures analyzed by CCAP are projected at \$608 million in 2010 and \$2.5 billion in 2020 and implementation would achieve nearly 90% of the emission reduction targets set by the Governor.³⁸

CALIFORNIA AIR RESOURCES BOARD

The California Air Resources Board (CARB), another state agency contributing to the CAT Report, developed the regulations relating to the Pavley Bill, California’s ground breaking legislation limiting the carbon dioxide emissions from vehicle tailpipes. Analysis conducted by CARB in 2004 determined that:

- Implementation of the Vehicle GHG Standards would produce net benefits to California residents of \$190 million in 2010 and \$2.8 billion in 2020³⁹ and produce some 53,000 new jobs by 2020.⁴⁰

CALIFORNIA ENERGY COMMISSION

The California Energy Commission (CEC) has conducted ongoing studies on the economic impacts of the state’s energy efficiency, renewable energy and clean technology measures. CEC research documents that:

- California’s existing building and appliance standards have saved individuals and businesses \$56 billion through 2003.⁴¹
- These building and appliance standards will save Californians an additional \$43 billion in utility costs by 2013.⁴²
- Efficiency and rebate programs approved by the state Public Utilities Commission in September 2005 will save consumers an additional \$5 billion over the lifetime of the measures.⁴³

ADDITIONAL INDEPENDENT RESEARCH INSTITUTES

Work by Environment California's Research Center, the Tellus Institute, and UC Berkeley Professor Dan Kammen of the Renewable and Alternative Energy Lab (RAEL) found:

- Current California policies to promote renewable energy, and growth of the renewables sector, will create 201,000 person-years of employment through 2017, with payroll benefits of \$8 billion.⁴⁴
- Proposed diesel anti-idling measures will save \$575 million through 2013 through reduced fuel use and engine maintenance costs.⁴⁵
- Each dollar invested in low-carbon energy systems creates three to five times more jobs than are created by the same level of investment in fossil-fuel energy production.⁴⁶

CLIMATE ACTION JOB GROWTH AND BUSINESS EXPANSION – EXAMPLES FROM OTHER REGIONS

National and regional governments across the globe are implementing regulations to reduce global warming emissions and making investments to stimulate the clean technology and renewable energy sectors. Experiences from Germany, the UK, China and others document job growth and business expansion stimulated by government initiated climate protection policies.

Between 2000 and 2005, national government policies helped Germany's renewable energy sector create 70,000 new jobs, increasing total employment in the clean energy sector to 170,000 jobs. By 2020, Germany expects that investment in the renewable energy sector will increase to \$306 billion per year, up from the current level of 40 billion Euros. Under this scenario, analysts project that the national economy will add 100,000 new jobs by 2020 for a total of 300,000 jobs in the renewable energy sector.⁴⁷

On a regional level, initiatives enacted by the German state of Schleswig-Holstein contributed to GHG emissions falling 13% between 1990 and 2000, during the same time wind energy became central to the region's economy. In 2004, the wind energy sector generated around 350 million Euros in regional income.⁴⁸ Currently Schleswig-Holstein generates 25% of its annual energy needs from wind energy.⁴⁹ Wind energy operators and producers now employ 5,000 people within the state – a figure likely to double by 2010 – and wind technologies feature as a growing export.

Wind energy businesses have grown in other regions with climate protection regulations. In the Province of Manitoba, Canada, the St. Leon Wind Energy Project created over 300

construction jobs in 2005, stimulated a \$200 (CN) investment in the local rural economy and guaranteed an annual income per turbine to local farmers.⁵⁰ In the UK, the British Wind Energy Association estimates that the offshore wind industry will create 5000 engineering jobs and 19,000 jobs overall.⁵¹

In 2005, China approved a Renewable Energy Promotion Law committed to producing 15% of the country's power from clean energy by 2020.⁵² Meeting this goal will require a twelve-fold increase in 2004 capacity to 130GW of renewable energy power by 2020 and investments of up to \$184 billion.⁵³ To spur business opportunities for Californian companies, in November 2005, Governor Schwarzenegger made a six-day visit to China and called for enhanced cooperation between California and China to develop clean and renewable energy sources and increase energy efficiency. "China and California face the same challenges – providing clean, abundant, reliable, affordable energy that will sustain our economies and our environment," Schwarzenegger said.

SNAPSHOT: CALIFORNIA COMPANIES LEADING THE TRANSITION TO A LOW-CARBON ECONOMY

The hundreds of California companies in the renewables sector already employ more than 170,000 people, and some 175 California companies export renewable energy products and services overseas. Here are a few of the recent standouts:

In February 2006, BP and Edison Mission Group (EMG), announced plans to build a \$1 billion hydrogen-fueled power plant in Carson, California. The plant will produce 500 MW of low-carbon generation – serving 325,000 homes – and will create 150 permanent and 1000 temporary construction jobs.

Sunnyvale-based SunPower builds solar cells for the residential market. The company's stock value surged 140% since its IPO in November, 2005. One month later, SunPower signed a \$300 million supply contract for solar panels with PowerLight Corporation, a Berkeley-based global provider of grid-connected solar electric power systems. Included in the deal is a solar panel that interlocks with residential home roof tiles and shingles creating a seamless sunlight-to-power solar technology. Executives of Cypress Semiconductor, the parent company of SunPower, claim that by 2010, solar power will be competitive with fossil fuel-based electricity generation.⁵⁴

Berkeley-based PowerLight Corporation is one of the fastest growing privately held companies in the U.S., designing, building and operating some of the largest solar electric systems in North America and Europe. In November 2005,

supply contract for PV solar modules with Evergreen Solar Inc., another U.S. solar leader.

With new financing obtained in late 2005, Fresno-based Pacific Ethanol announced plans to begin operations at its new Madera country-based large-scale ethanol production facility in the 4th quarter of 2006. Kinergy Marketing LLC, a wholly-owned subsidiary of Pacific Ethanol, is the largest West Coast-based marketer of ethanol. Pacific Ethanol plans to build four additional ethanol processing facilities on the West Coast, and is working to develop cellulose-based ethanol.

Two large-scale solar projects in California's Mohave Desert will boost industrial-scale development of the sector. A project in Victorville, California by Phoenix-based Stirling Energy Systems Inc., approved by state regulators in late 2005, will produce 500MW of electricity, doubling California's solar capacity and providing enough power to meet the needs of 300,000 homes. The project will use 20,000 solar dishes and will cover 4 square miles of desert. A second project in the Imperial Valley, east of San Diego, awaiting approval, would produce 300MW of energy and could be expanded too as large as 900MW.

CONCLUSION

California faces an unprecedented window of opportunity to make clean technologies available to the rest of the world and to share its expertise in addressing this urgent global problem.

Market signals from state actions such as those proposed in the California Climate Action Team Report can spur innovation. State policies to minimize global warming pollution can unleash California's world-famous innovative spirit and enable the state and our businesses to lead and benefit from the increased worldwide demand for clean energy and clean technology. In sum, California actions to protect our global climate are good news for business and for California's economy.

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THE CLIMATE GROUP

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