

TO: JAMES L. APP, CITY MANAGER  
FROM: RON WHISENAND, COMMUNITY DEVELOPMENT DIRECTOR  
SUBJECT: ECONOMIC STRATEGY: NATURAL RESOURCE MANAGEMENT PLAN

DATE: MAY 20<sup>th</sup>, 2008

Needs: For the City Council to authorize measures to aid in the development of a Natural Resource Management Plan.

- Facts:
1. The City Council has adopted goals, policies, principles and actions in the City's General Plan and Economic Strategy designed to improve the quality of life for residents and visitors.
  2. The City has been working toward implementing many of these goals, policies, principles and actions. Accomplishment of these items may be accelerated through more cohesive, focused actions, developed and documented in a *Natural Resource Management Plan*.
  3. The Natural Resource Management Plan would be based on fundamental principles consistent with the City's General Plan and Economic Strategy including:
    - Promote local industry and agriculture;
    - Conserve energy and natural resources;
    - Maximize use of resources and infrastructure; and
    - Preserve and enhance the natural environment
  4. The Plan would include an analysis of impacts from human activity, such as a green house gas emissions inventory as mandated by State Assembly Bill 32. Development of this analysis would be assisted through use of technical information, methods and quantitative tools.
  5. An international organization known as "ICLEI" – the International Council of Local Environmental Initiatives / Local Governments for Sustainability, has expertise, a proven method and specific modeling tools for quantifying and evaluating this type of technical information to be included in the Plan.
  6. ICLEI requires agencies that would like to use their software for quantifying green house gas emissions to adopt a resolution committing to participate in the Cities for Climate Protection Campaign, and promote public awareness about climate change.

7. A multi-disciplinary team of City staff is educated and trained using ICLEI tools to conduct the necessary tasks required to prepare a Natural Resource Management Plan without outside consultant assistance.

Analysis &  
Conclusions:

A central driver for this project is the City's goal of continued prosperity and economic leadership, and the desire to maintain a sustainable standard of living and high quality of life. As emphasized in the Economic Strategy, the City recognizes the economic value of natural and human capital, which embraces economic, social and environmental responsibility – also known as the “triple bottom line”.

Benefits from developing this plan include:

- Support local businesses and attract new business investment
- Reduce energy consumption and associated costs
- Preserve and enhance natural resources
- Minimize the waste of natural resources
- Reduce vehicle miles traveled
- Provide opportunities for healthier lifestyles
- Develop the means to comply with new legislation related to green house gas emissions
- Community education about natural resources and energy

The topics proposed to be incorporated into this plan to achieve the benefits noted above include:

- **Community Design:** land uses and site planning, circulation patterns, transportation accessibility and modes, public health and urban forestry practices
- **Energy:** energy efficiency and conservation, energy sources, building design, and vehicle fleets
- **Systems:** water resource availability and quality, wastewater management, storm water management, and landfill management including recycling and waste reduction

Many of these topics are interconnected. An example of combined effects of these topics could be development of buildings with increased energy efficiency through site design, architecture and energy systems. This could reduce energy costs, save natural resources (e.g. coal, oil, and water), reduce

green house gas emissions, and spur the demand for new “green collar” businesses and services.

Community participation would be a cornerstone in developing this plan. It is important for citizens to learn about local natural resources and energy use, and how these issues affect their lives and businesses. Equally important is to share information with the community about this project, and get their input on what would be effective and acceptable for Paso Robles to achieve the goals and objectives of the plan.

As noted above, the international organization known as “ICLEI” has technical information and expertise that can assist the City with this project, specifically to conduct a large scale inventory of green house gas emissions from government (City) and community facilities. The methodology for developing these inventories can be used to prepare baseline data to quantify how the City can save energy, reduce costs and reduce green house gas emissions. A software program developed by ICLEI is an accepted methodology by the State Air Resources Board. This software also has the capability to analyze the costs and effectiveness of differing energy systems, and it provides information on cost recovery should the City consider changes energy systems.

Fiscal Impacts: No direct costs; City staff time.

Options: After opening the public hearing and taking public testimony, the City Council is requested to take one of the actions listed below:

- a. Approve the attached Resolution.
- b. Amend, modify, or reject the above-listed action.
- c. Request additional information and analysis.

Staff Report prepared by: Susan DeCarli

**Attachments:**

1. Resolution
2. Literature and articles
3. Newspaper Notice

RESOLUTION NO.

A RESOLUTION OF THE CITY OF EL PASO DE ROBLES  
AUTHORIZING MEASURES TO AID IN THE DEVELOPMENT OF A NATURAL  
RESOURCE MANAGEMENT PLAN

WHEREAS, the City Council has adopted goals, policies, principles, and actions in the General Plan and Economic Strategy for the City of El Paso de Robles to improve the quality of life for residents and visitors including:

- Support local industry & agriculture
- Conserve energy and natural resources
- Maximize use of resources and infrastructure
- Preserve and enhance the natural environment

And, these objectives shall be pursued by, among other future initiatives:

- Encouraging infill development while preserving open space area and reducing traffic congestion and vehicle miles traveled.
- Establishing compact, multi-dimensional land use patterns to minimize impact of cars and promote alternative transportation.
- Providing safe and convenient pedestrian, bicycle and public transit access across the city.
- Establishing agricultural and open space areas to buffer urbanization and promote resource efficient growth patterns.
- Implementing a variety of water acquisition, conservation and reuse programs to maintain a safe, reliable water supply.
- Preserving native vegetation, wildlife, and habitat areas, through avoidance, impact mitigation, and habitat enhancement
- Promoting local industry, agriculture, and commerce to provide for local needs.

WHEREAS, the City's pursuit and accomplishment of these goals, policies and principles may be accelerated through focused action; and

WHEREAS, focused actions may be developed and documented in a Natural Resource Management Plan; and

WHEREAS, a Natural Resource Management Plan will benefit from baseline data to evaluate fundamental challenges and opportunities, as well as provide a point of comparative measurement; and

WHEREAS, an inventory of human activity impacts, i.e., a green house gas emission inventory, is a means of documenting those impacts; and

WHEREAS, the international organization known as, “ICLEI” – Local Governments for Sustainability, has technical information and expertise that can assist the City in developing a greenhouse gas inventory, and in turn, contribute to preparation of the Natural Resource Management Plan; and

WHEREAS, the Cities for Climate Protection Campaign sponsored by ICLEI has developed a proven method and tools for quantifying energy use, energy efficiency, and associated green house gas emissions; and

WHEREAS, local government actions taken to increase energy efficiency and reduce green house gas emissions provide multiple local benefits by: reducing energy expenditures; saving money for the local government, its businesses and residents; decreasing air pollution; and

WHEREAS, the State legislature adopted AB 32 (known as the California Global Warming Act of 2006), established a multi-year program to reduce green house gas emission to 1990 levels by the year 2020, see Exhibit A; and

WHEREAS, preparation of a Natural Resource Management Plan incorporating the Cities for Climate Protection Campaigns program and tools, as provided in Exhibit B, will put Paso Robles in a position to effectively implement State goals of AB 32 to reduce green house gas emissions.

WHEREAS, the Cities for Climate Protection Campaign sponsored by ICLEI - Local Governments for Sustainability has invited the City of El Paso de Robles to join ICLEI and become a partner in the Cities for Climate Protection Campaign.

THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF EL PASO DE ROBLES:

Section 1. To assist in development of the Natural Resource Management Plan the City has joined ICLEI and participate in the Cities for Climate Protection Campaign and, promote public awareness about climate change.

Section 2. That the Natural Resource Management Plan will address, and the City will undertake a five milestone methodology to reduce both greenhouse gas and air pollution emission throughout the community, and specifically:

- Conduct a greenhouse gas emissions inventory and forecast to determine the source and quantity of greenhouse gas emissions in the jurisdiction;
- Establish a greenhouse gas emissions reduction target;
- Develop an action plan with both existing and future actions which when implemented will meet the local greenhouse gas reduction target;
- Implement the action plan; and
- Monitor and report progress.

Section 3. That the City requests technical assistance from ICLEI's Cities for Climate Protection Campaign as it progresses through the milestones.

PASSED AND ADOPTED by the City Council of the City of El Paso de Robles this 20th day of May, 2008 by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

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Frank R. Mecham, Mayor

ATTEST:

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Deborah Robinson, City Clerk



# Planning for Greenhouse Gas Emission Reductions

by Ken Loman and Charles Summerell

An increasing body of scientific research links greenhouse gas (GHG) emissions with rising land and ocean temperatures, changes in storm and rainfall patterns, seasonal temperature variations, rising sea levels and other evidence of climate change.

In response, cities and counties, with the help of regional and state agencies, are pioneering new strategies to incorporate reduction of GHG emissions in their planning processes using two key steps:

1. Preparing a GHG inventory for both the agency's operations and the community as a whole; and
2. Preparing a plan of actions the community will take to reduce GHG emissions.

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Ken Loman is a policy consultant for the California Climate Action Network, a program of the Institute for Local Government (ILG), and can be reached at <[kloman@ca-ilg.org](mailto:kloman@ca-ilg.org)>. Charles Summerell is a program analyst for ILG and can be reached at <[summerc@ca-ilg.org](mailto:summerc@ca-ilg.org)>. Special thanks to the following individuals who contributed to this article: Betsy Strauss, special counsel to the League; Beth Gabor, public information officer, Yolo County; Jill Boone, sustainability consultant to the City of San Mateo; and Nancy McKeever, PLACE'S program manager, California Energy Commission. For more information about ILG's climate change program, visit [www.ca-ilg.org/climatechange](http://www.ca-ilg.org/climatechange).

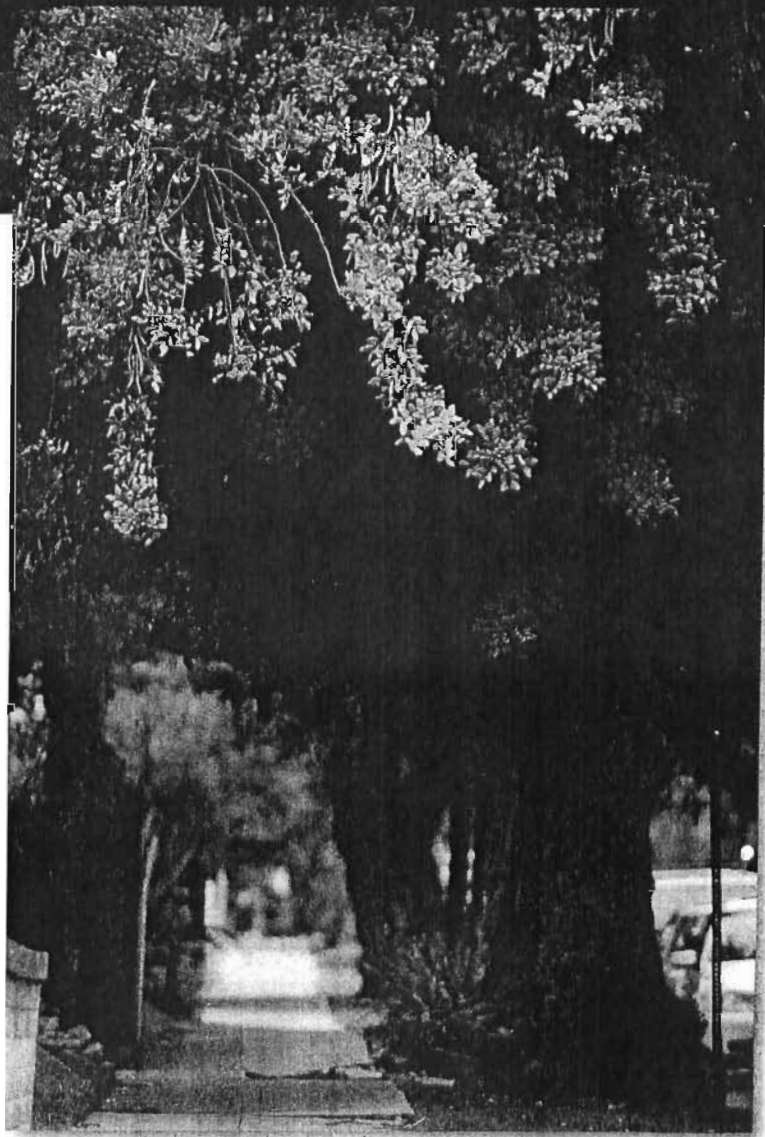


### Local Agencies Take the Initiative

Some local agencies have made such preparations out of concern about climate change impacts. For example, in 2002, Sonoma became the first county in the nation where all cities and the county committed to reduce their GHG emissions. They formed a nonprofit organization, the Sonoma County Climate Protection Campaign (SCCPC), which prepared a comprehensive GHG emission inventory for the entire county that was funded by the Bay Area Air Quality Management District.

The inventory categorized emissions into four sectors: electricity and gas; vehicular transportation; agriculture; and solid waste. After analyzing the inventory results, the SCCPC recommended that Sonoma develop a plan to achieve a 20 percent reduction from 1990 emission levels by 2010, and 25 percent by 2015.

*continued*





### Litigation Pressures

Other local agencies have found themselves under legal pressure to prepare an inventory and plan. For example, in 2007, the state attorney general sued the County of San Bernardino, arguing that the environmental impact report in the county's General Plan update did not adequately analyze air quality and climate change impacts, and that the county should have

adopted mitigation measures to minimize the update's impact on air quality and climate change.

The case settled in August 2007. Among other things, the county agreed to add the goal of reducing GHG emissions attributable to discretionary land use decisions and the county's internal operations to the General Plan, and to prepare a GHG

emissions reduction plan that includes an analysis of:

- GHG emissions sources in the county;
- An estimate of 1990 GHG emissions levels;
- A projection of GHG emissions levels in 2020 resulting from discretionary land use decisions and internal county operations; and
- An emissions reduction target.

The county agreed to prepare a General Plan amendment, the inventory of emissions sources, the GHG reduction plan and an environmental review of those documents within 30 months of the settlement agreement's approval.

### Inventory Resources

An inventory of GHG emissions produced in the community enables local agencies to understand which activities generate GHG emissions, identify and prioritize emissions reduction measures, and monitor progress in reducing emissions levels. For examples of community GHG inventories, visit [www.ca-ilg.org/climateinventories](http://www.ca-ilg.org/climateinventories).

### San Mateo's Experience

In 2007, the City of San Mateo prepared a GHG inventory for city operations and facilities and certain sectors of the community. The information needed for the inventory included:

**Electricity and Gas Use.** San Mateo tracked electricity and natural gas usage with data provided by the local utility, Pacific Gas & Electric, which also provided information used to convert these numbers into GHG emissions.

**Solid Waste Disposal and Landfills.** The city's solid waste disposal contractor provided disposal and recycling data for city operations and facilities. The city used the Waste Reduction Model (WARM) ([http://epa.gov/climatechange/wycd/waste/calculators/Warm\\_home.html](http://epa.gov/climatechange/wycd/waste/calculators/Warm_home.html)), offered by the U.S. Environmental Protection Agency, to convert the data

to carbon dioxide emissions. Inputs include such variables as tonnages of waste and recycling, distances to the landfill and whether or not the landfill collects or processes methane.

The city obtained communitywide waste disposal data from the California Integrated Waste Management Board website ([www.ciwmb.ca.gov/LGCentral/DRS/Reports/Orgin/WFOrgin.asp](http://www.ciwmb.ca.gov/LGCentral/DRS/Reports/Orgin/WFOrgin.asp)).

**Vehicles and Transportation.** The city surveyed its fleet and employees about their commute patterns and analyzed their fuel use. To convert gallons of gasoline and diesel to pounds of GHG, San Mateo used these factors, provided by Sustainable Silicon Valley:

- Diesel gallons to pounds of carbon dioxide – 21.05;
- Gasoline gallons to pounds of carbon dioxide – 19.43; and
- Biodiesel B20 (20 percent biodiesel blended with 80 percent petroleum diesel) and gallons to pounds of carbon dioxide – 17.89.

To analyze communitywide transportation impact, the city estimated vehicle miles traveled in the city for the year. This number was multiplied by an estimate of emissions per mile based on information provided by the air district, ICLEI (Local Governments for Sustainability) and the state Air Resources Board ([www.arb.ca.gov/msei/onroad/latest\\_version.htm](http://www.arb.ca.gov/msei/onroad/latest_version.htm)).

San Mateo's inventory includes a discussion of existing city practices to reduce emissions and next steps to reduce GHG emissions from city operations. In December 2007, a community stakeholder committee finalized recommendations on how the city can reduce communitywide GHG emissions. These recommendations now form the city's Sustainable Initiatives Plan ([www.cityofsanmateo.org/green.html](http://www.cityofsanmateo.org/green.html)).

### **Yolo County's Experience**

Yolo County's inventory effort was structured by the county's decisions in July 2007 to join the California Climate Action Registry (CCAR) and use 2006 as

its base year for evaluating reductions in GHG emissions from county operations.

Fuel, electricity and natural gas purchases accounted for nearly 99 percent of the county's total GHG generation. In August 2007, Yolo County submitted to the CCAR a *Total Emissions Summary Report*, which detailed all emissions information for facilities, fleet and stationary sources that are part of the county's operations.

The CCAR requires the report to be audited by an approved independent consultant. The county's calculations passed the audit and the CCAR reviewed the calculations for final certification in January 2008.

The county plans to develop a regional plan that establishes short-, mid- and long-term GHG reduction targets, with recommended goals to stop increasing emissions by 2010 and to achieve a 10 percent reduction every five years thereafter through 2050.

### **Technical Assistance Resources**

Two organizations offer technical assistance to local governments preparing GHG emissions inventories:

**The California Climate Action Registry** ([www.climateregistry.org](http://www.climateregistry.org)) is a nonprofit, public-private partnership. It provides software to help local agencies prepare an emissions inventory related to agency operations. The Climate Action Registry Reporting Online Tool (CARROT) helps registry members calculate their annual GHG emissions and/or report these emissions to the registry. Membership fees are calculated on a sliding scale based on the agency's budget and cover use of the web-based CARROT, training sessions and other member benefits.

**ICLEI** ([www.iclei.org](http://www.iclei.org)) helps its members assess their baseline emission inventories and emission forecasts. In some cases, ICLEI will coach a member agency on how and from whom to collect data for an inventory. Alternatively, ICLEI can do the inventory for an agency. ICLEI membership requires an annual fee.

### **Resources for Preparing a GHG Reduction Plan**

Once an agency has identified and quantified its GHG emissions, it can take steps to reduce them. Although local agencies use a number of individual policies and practices to do this, many agencies have found it useful to combine these efforts into an overall GHG reduction plan. Examples of community climate action plans can be found at [www.ca-ilg.org/climateplans](http://www.ca-ilg.org/climateplans).

#### ***Plan Manuals and Templates***

Perhaps the most comprehensive resource to assist in plan preparation is the *Climate Protection Manual for Cities* prepared by Natural Capitalism Solutions and ICLEI. The manual provides a general process for developing a plan as well as specific topics to include in the plan with examples and case studies in each area. It's available free online at [www.climatemanual.org](http://www.climatemanual.org).

Stopwaste.org has created a companion set of document templates for a plan (<https://www.stopwaste.org/home/index.asp?page=516#ACCPA>; scroll to the middle of the page). Although the templates are focused on Alameda County, they provide useful guidance on what might be included in an agency's plan. (These templates were created in partnership with ICLEI and refer to services it provides member communities, which may not be available to non-member communities.)

### ***Land Use Planning***

The California Energy Commission, working in partnership with local and regional agencies, has developed a web-based comprehensive planning tool called Internet-accessed Planning for Community Energy, Environmental and Economic Sustainability (I-PLACE<sup>3</sup>S) to support integrated transportation, land use, economic and environmental analysis ([www.energy.ca.gov/places](http://www.energy.ca.gov/places)). This tool measures the expected levels of GHG emissions associated with different planning scenarios, in addition to other evaluation criteria.

I-PLACE<sup>3</sup>S can be scaled from neighborhood and small city levels up to regional metropolitan planning organizations. There is a sliding-scale fee for using I-PLACE<sup>3</sup>S that includes online access to the software, web security and technical support.

The Sacramento Area Council of Governments (SACOG) used I-PLACE<sup>3</sup>S for its regional Blueprint Planning Project ([www.sacregionblueprint.org](http://www.sacregionblueprint.org)). The blueprint process developed a regional growth plan designed to better meet the area's long-term transportation needs. By emphasizing

improved land use planning to increase mobility options, the plan projects a 15 percent per capita reduction in GHG emissions and a 25 percent reduction in vehicle miles traveled by 2050 (among other goals). For a recorded demonstration of the I-PLACE<sup>3</sup>S software, visit [www.sacregionblueprint.org/sacregionblueprint/the\\_project/technology.cfm](http://www.sacregionblueprint.org/sacregionblueprint/the_project/technology.cfm).

Most regions are already engaged in blueprint-style planning projects and may have I-PLACE<sup>3</sup>S information for a given agency. Check with your local regional transportation planning agency or council

of governments (visit [www.calpin.ca.gov/directory/cog.asp](http://www.calpin.ca.gov/directory/cog.asp) for a list) to determine what information may be available.

Other proprietary planning tools are also available to evaluate planning scenarios for their effect on GHG emissions and other

criteria. Information about specific costs and capabilities is available by contacting vendors directly. Many can be found through Internet searches using terms such as land use planning tools, community planning tools, sustainability measurement tools or measuring sustainability.

### **Urban Forest Evaluation**

The Urban Forest Effects (UFORE) model developed by the U.S. Forest Service ([www.fs.fed.us/ne/syracuse/Tools/tools](http://www.fs.fed.us/ne/syracuse/Tools/tools)) quantifies the effect of trees on air pollution, GHGs and global warming, and building energy use. Like the land use planning tools described here, UFORE evaluates how including urban trees in different planning scenarios can reduce a community's overall GHG emissions. A broader set of tools for assessing and managing community forests is available at [www.itreetools.org](http://www.itreetools.org).

The Institute for Local Government is collecting case studies of communities using the resources described here, which are available at [www.ca-ilg.org/climatechange](http://www.ca-ilg.org/climatechange).

### ILG Best Practices Framework

As part of its California Climate Action Network ([www.ca-ilg.org/climatechange](http://www.ca-ilg.org/climatechange)), the Institute for Local Government (ILG) has prepared a framework of best practices to guide local agencies' consideration of items to include in their plans. The framework ([www.ca-ilg.org/climatepractices](http://www.ca-ilg.org/climatepractices)) identifies 10 sectors of activities:

1. Conserving energy and using it more efficiently;
2. Reducing waste and recycling;
3. Conserving water and improving the efficiency of water and wastewater treatment systems;
4. Concentrating land uses to take advantage of walking, bicycling and transit;
5. Improving transportation efficiency;
6. Designing green buildings;
7. Buying products and services with GHG emission reduction in mind;
8. Using nature to store carbon;
9. Using alternative and low-carbon fuels; and
10. Encouraging individuals, businesses and the community to reduce GHG emissions.

Additionally, the California Climate Action Network recognizes agencies and communities that demonstrate measurable reductions in GHG emissions. For more information about ILG's recognition program, visit [www.ca-ilg.org/climaterecognition](http://www.ca-ilg.org/climaterecognition).

### Conclusion

The process of inventorying GHG emissions and developing plans to reduce such emissions is an evolving area. Technological innovations mean that local agencies may have options today to reduce emissions that were not available even a year ago.

The good news is that many organizations — governmental, nonprofit and private sector — are working hard to provide local agencies with information and options in this area. Furthermore, cities and counties are pioneering new strategies and have much information to share with one another about effective strategies and potential improvements. One of the California Climate Action Network's goals is to help connect local officials with those resources and each other. Learn more by visiting [www.ca-ilg.org/climatechange](http://www.ca-ilg.org/climatechange). ■

## CEQA, General Plans and Climate Change

One approach to avoiding a potential California Environmental Quality Act (CEQA) challenge to a city's General Plan is to perform a GHG emissions inventory and prepare a plan to address those emissions. Addressing the impact of a city's policies, programs and operations on climate change can be incorporated into the city's General Plan in two phases:

1. Complete an environmental analysis of the impact of the land use, circulation, housing, open space, and air quality programs and policies on climate change in general and on GHG emissions more specifically;
2. Complete a GHG emissions inventory and adopt a GHG reduction plan either as an amendment to the General Plan or as a required subsequent action.

One obstacle to incorporating climate change into the CEQA analytic framework is the lack of thresholds of significance to guide the analysis. The California Air Pollution Control Officers Association has developed recommendations for thresholds of significance that may be helpful in this regard ([www.capcoa.org](http://www.capcoa.org)). For more information and resources on this topic, visit [www.ca-ilg.org/climateCEQA](http://www.ca-ilg.org/climateCEQA).

In addition, a wide variety of CEQA documents have incorporated climate change analysis through the thresholds of significance adopted for an air quality impact analysis. A database of CEQA documents is available at [www.ceqamap.com](http://www.ceqamap.com).

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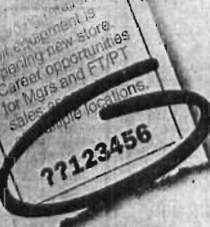
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#### Charged up

America will need to train more than 270,000 new electrical and power line workers by 2016, according to new stats from the U.S. Department of Labor. Predictions show that between 2006 and 2016, an annual average of 27,000 new electricians will be necessary to accommodate industry growth and to replace those leaving the workforce. By 2016, the total number of electrical and power line workers is expected to reach 877,000.

### joboutlook

#### Law in order

In the face of mixed economic reports, nearly half of law firms and corporate legal departments expect to hire additional lawyers in the next 12 months, a new survey shows. "Caseloads are rising, both in corporate legal departments and within law firms," says Charla Volkert, executive director of Robert Half Legal, a legal staffing firm that conducted the survey. "A higher volume of litigation and an ongoing focus on corporate governance mandates continue to drive legal hiring activity."

### employmentguide

#### Suit yourself

Many experts and academic counselors believe the key to overcoming career indecision is for students to consider their personality type before choosing a major. "Your personality type can predict how well your skills will match the demands of the tasks in a particular major or job."

### Career confidence

Workers remain confident in their job security despite threats of a recession in the U.S. economy, according to a survey from the staffing firm Spherion. The survey shows that 65 percent of workers expressed confidence in the future of their current employer, while more than half (51 percent) were confident in their ability to find a new job. Also 78 percent of workers believe their jobs are secure. "While job growth has slowed significantly in the past six months, we're still seeing demand for skilled talent, especially in professional jobs," says Roy Krause, president and CEO of Spherion.

### Book smarts

Companies value tech professionals' MBA degrees much more than experience, according to research from the University of Maryland's business school. An IT professional with an MBA degree earns 46 percent more than a counterpart with only a bachelor's degree, the research showed. "Our research confirms that getting an MBA is the single best move you can make to increase your value as an IT professional in today's market," says Sunil Mithas, a professor and author of the study.



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**A**s concerns over global warming and rocketing oil prices weigh on Americans' minds, a new generation of "green collar" workers are looking to use their talents to improve the country's emerging sustainable energy industry.

Specialties in everything from solar power to energy efficient building design have moved to the forefront as rising corporate interest in going green has resulted in a definite need for more environmental experts.

"It's the new Silicon Valley," says John Stayton, director of a green graduate program in sustainable enterprise at Dominican University in San Rafael, Calif.

## 'Green collar' jobs signal employment shift toward eco-friendly economy

At a time when the nation's manufacturing employment is on the downturn, jobs in sustainable energy may help fill the gap. For example, Hocking College in Nelsonville, Ohio, was recently awarded a \$1.6 million grant from the U.S. Department of Commerce's Energy Development Administration to build an innovative learning facility that will feature modern labs for students studying in the college's sustainable energy programs.

"Training skilled workers is critical to attracting renewable energy companies to Ohio and recharging the state's manufacturing base," says Jerry Hutton, dean of energy and transportation technologies at Hocking.

Jobs in sustainable energies such as wind, solar, geothermal and hydropower are just some of the many gaining momentum.

William L. Chameides, dean of Duke University's Nicholas School of the Environment and Earth Sciences, says while climate change and sustainability are global issues, "solutions can start at the local level."

"The environmental issues facing society are myriad and daunting, but they are tractable," Chameides said. "They will require a new kind of professional, with an interdisciplinary approach and an understanding that spans the physical and biological sciences to the social sciences."

While earning a specialized "green" degree will have you on the cutting edge of the renewable energy push, you also can qualify for many jobs in sustainable energy with a traditional degree and some extra training.

Here are a few industries already focusing on the environment:

#### Wind power

Wind power laboratories are

constantly trying to improve the design and efficiency of wind turbines. These research and development efforts employ mechanical, electrical and aeronautical engineers with advanced degrees, as well as experienced technicians.

The growth of wind power requires people with business, meteorological and engineering experience to plan and build projects. Meteorologists help engineers identify appropriate sites with suitable wind conditions. Engineers then design the wind plant, working with the utility companies and communities. Construction workers are needed to build the wind plant, and mechanical and electrical technicians, called "windsmiths," operate and maintain the wind turbines.

#### Solar power

Growth of the solar power industry has created high-wage, skilled jobs throughout the country for individuals with many different types of degrees and training. Individuals employed in solar research and development generally have professional degrees in electrical, mechanical and chemical engineering, as well as materials science and physics.

New workers are needed as national laboratories, universities and private companies develop and continually try to improve solar products to lower their costs and improve their reliability.

#### Bioenergy

Jobs in bioenergy — renewable energy made from biological sources — cut across a wide spectrum of specialties and skills, and if efforts succeed in making bioenergy more commercially profitable, America may see a dramatic increase in the number of jobs.

Universities and national laboratories are working together to find solutions to the difficult problems surrounding the production and use of biomass for energy and products. These efforts require chemists, agricultural specialists, microbiologists, biochemists and engineers, to name a few.

Engineers and construction workers are needed to design and build bioenergy plants, while electrical and mechanical technicians, engineers, mechanics and equipment operators are needed to run and maintain these plants. Some jobs require cross training in areas such as engineering and biology, or chemistry and agriculture.

#### Geothermal energy

The geothermal industry employs both skilled workers and those with professional degrees. Developing hot water reservoirs requires geologists, geodermatologists, geophysicists, hydrologists, reservoir engineers, mud loggers, hydraulic engineers and drillers to locate, assess, and gain access to the reservoirs. Environmental scientists prepare impact studies, and permit and leasing specialists obtain the land rights.

Geothermal technologies also create jobs for heating engineers, and in the building and agricultural industries for electricity production, engineers and construction workers — along with a number of other skilled workers — are needed to design and construct power plants.

#### Hydropower

As with many of the other renewable energy technologies, the design, construction and maintenance of hydropower plants require electrical and mechanical engineers, technicians and other skilled workers.

If a hydropower project also involves managing reservoir and surrounding land, the developer will hire recreation planners, resource managers and educators. In addition, state and federal licensing laws now require hydropower plant builders to assess the environmental effects of their operation. Thus, hydropower industry also employs environmental scientists (biologists, hydrologists, ecologists, and wildlife habitat specialists, for example) to assess environmental impacts and address environmental cleanup.

Environmental scientists, as well as engineers also participate in research efforts through private companies, national laboratories and universities.

**Next week:** On Earth Day, we'll take a look at what companies are doing to reduce their carbon footprint, and how employees can help.



# Global Climate Change: A Local Issue

## Global Warming 101

### *The Greenhouse Effect*

The climate we enjoy on Earth is made possible due to a delicate balance of naturally occurring gases that trap some of the sun's heat near the Earth's surface. This naturally-caused greenhouse effect is what keeps the Earth's temperature stable at an average of approximately 60°F—warm enough to support life as we know it. Without this natural greenhouse effect, our planet's average temperature would not be warm enough to sustain life.

### *Global Warming:*

#### *The Enhanced Greenhouse Effect*

The problem we now face is that human actions have disturbed this natural balance by producing additional large amounts of some of these greenhouse gases (GHGs) that are warming the climate. The two greenhouse gases of most concern to local governments are carbon dioxide, or CO<sub>2</sub>, and methane.

Emissions of CO<sub>2</sub> are produced whenever fossil fuels—such as oil, natural gas, gasoline, diesel fuel, and coal—are burned to produce electricity, heat buildings or power vehicles. Through daily energy-using activities, we are increasing the amount of CO<sub>2</sub> in the atmosphere and magnifying the natural greenhouse effect. The net effect of this increased atmospheric concentration of CO<sub>2</sub> and other GHGs is to trap more of the sun's heat, causing the Earth's average temperature to rise—the phenomenon known as global warming.

Methane is the second most important greenhouse gas resulting from human activities. Methane, or CH<sub>4</sub>, is a byproduct of organic waste and sewage decomposition. In

Global Warming

The diagram illustrates the greenhouse effect. A sun in the upper left corner emits rays of solar radiation towards the Earth. The Earth is shown as a globe with continents. An arc above the Earth is labeled 'ATMOSPHERE'. A curved arrow points from the Earth's surface up into the atmosphere, labeled 'Elevated CO<sub>2</sub> and methane levels trap heat in the Earth's atmosphere'. Another curved arrow points from the atmosphere back down towards the Earth's surface. A small triangle is positioned below the Earth's surface.

- Solar radiation passes through the Earth's atmosphere—some is reflected back into space, most is absorbed by the Earth and sent back out as thermal radiation or heat.
- “Greenhouse gases” like CO<sub>2</sub> and methane in our atmosphere trap this heat causing a natural “greenhouse effect”, which keeps the Earth warm enough to support life as we know it.
- Human activities are increasing levels of CO<sub>2</sub> and methane and enhancing the greenhouse effect—too much heat is trapped, causing global warming.

urban areas, methane gas is produced as organic waste such as paper, yard trimmings, wood, and food waste decompose in landfills. Sewage treatment plants are also a significant urban source of methane. In terms of its greenhouse effect, methane is 21 times more powerful per unit of carbon than CO<sub>2</sub>.

There is scientific consensus that global warming is occurring and that humans are the primary cause. Pre-industrial levels of carbon dioxide (CO<sub>2</sub>) were 270 to 280 parts per million (ppm) in the atmosphere. Today, the level of CO<sub>2</sub> in the atmosphere is about 368 ppm – about 30% higher.<sup>2</sup> Scientists participating in the British Antarctic Survey have succeeded in charting the atmospheric concentration of carbon dioxide over the last 800,000 years. Their research has shown that temperature unfailingly rises and falls in response to carbon dioxide levels.

CO<sub>2</sub> levels are higher now than they have been in the past 650,000 years. According to NASA scientists, the 1990s were the warmest decade of the century, and the first decade of the 21<sup>st</sup> century is well on track to be another record-breaker. The years 2002, 2003, 2004 2005 and 2006 along with 1998, were the warmest six years since the 1890s, with 2006 being the warmest year in over a century. Over the last 100 years, temperatures at the Earth's surface increased by an estimated 1.4 degrees F.<sup>3,4</sup> This present concentration of CO<sub>2</sub> will double in 45 years if current patterns of fossil-fuel use continue, with drastic temperature increases predicted to occur as well.

Even the slightest increase in average global temperature can cause major changes in climate patterns, resulting in more frequent and extreme weather events. Globally, while some regions may experience warming, other regions may become colder. Precipitation may increase in some regions, causing floods and mudslides, while decreasing in other regions, causing droughts and water shortages.

Here in the U.S., we are already feeling climatic effects of more frequent and extreme weather events, mirroring the models developed by scientists. Over the last several years, the Midwest has endured one of the worst droughts on record. Higher temperatures are melting the snow-pack that provides much of the water supply for people in the western United States. Experts predict the region could lose nearly half its water supply by 2100.

## *Climate Change and Local Communities*

### *Cities and Counties are Impacted*

As the population centers of the world, urban and suburban areas will experience most of the negative impacts of climate change. Whether these climate changes affect

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<sup>2</sup> Intergovernmental Panel on Climate Change (IPCC). "[Climate Change 2001: Synthesis Report, Summary for Policymakers](#), 2001.

<sup>3</sup> National Aeronautics and Space Administration (NASA). "[2005 Warmest Year in Over a Century](#)," January 24, 2006

<sup>4</sup> National Oceanic and Atmospheric Administration (NOAA). "[NOAA Reports 2006 Warmest Year on Record for U.S.](#)," January 9, 2007



agricultural production and thus food supply, or an extreme weather event that hits a specific urban area, the impacts will be hardest felt by local communities.

**Heat.** Prolonged heatwaves, which scientists predict will occur with increasing frequency, hit urban areas hard. The impact of hot weather is intensified by certain features of the typical urban landscape. Dark surfaces of pavements and rooftops that cover the typical urban landscape worsen heatwaves, as they absorb and trap additional heat when struck by solar rays and increase already higher temperatures. The European heat wave of 2003 killed over 35,000 people, and raised even more concerns there about global warming. The heat wave that struck California in 2006 killed 140 people.

Another serious implication of hotter temperatures is the increase in incidences of diseases, such as malaria, dengue fever, and others spread by vectors that are temperature dependent. Malaria has been confined to tropical regions because the species of mosquito that carries the virus can only live within a small temperature range. As areas get hotter, the geographic range of the mosquito and the malaria it carries grows larger.

**Air pollution.** The issues of global warming and the dirty air that often plagues cities are closely linked. First, the primary activities that create the emissions that cause these two problems are essentially the same—the burning of fossil fuels for energy production, industrial processes or powering vehicles. As fossil fuel combustion increases, the emissions that cause global warming and air pollution also increase.

Second, hotter urban temperatures intensify air pollution. The chemical mix needed for ground-level ozone formation, which is one of the most damaging aspects of urban smog, requires not only air pollution emissions like nitrous oxide and VOCs, but also sunlight and heat. An average annual increase of only 0.5°F can turn an urban area that has worked hard to cut air pollution emissions into a non-attainment area due to an increase in the conditions that create smog.

A nationwide study of 95 urban areas jointly conducted by John Hopkins Bloomberg School of Public Health and the Yale University School of Forestry and Environmental Studies in 2004 showed that changes in ground-level ozone were significantly associated with an increase in deaths. The researchers calculated that a 10 ppb reduction in daily ozone, which is roughly 35 percent of the average daily ozone level, could save nearly 4,000 lives throughout the 95 urban communities included in the study.<sup>5</sup>

Children are particularly at risk, as their lung tissues are still developing and their air passages are smaller than those of adults. Incidences of asthma are also strongly associated with periods of high ozone pollution. Asthma studies in Los Angeles, CA and Houston, TX have found that chest discomfort increased by 17% with high ambient ozone levels.

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<sup>5</sup> Michelle L. Bell, PhD; Aidan McDermott, PhD; Scott L. Zeger, PhD; Jonathan M. Samet, MD; and Francesca Dominici, PhD. "[Ozone and Short-Term Mortality in 95 U.S. Urban Communities, 1987-2000.](#)" *John Hopkins Bloomberg School of Public Health and the Yale University School of Forestry and Environmental Studies*. November, 2004



**Damage to infrastructure and property.** Hurricanes, blizzards, storms, and floods cause billions of dollars of damage each year. Most of that damage occurs in urban or suburban areas. With huge investments in private and public works infrastructure, cities and urbanized counties are especially vulnerable to the effects of climate change. Federal and state disaster relief programs cannot begin to cover the types of long-term economic, property, and infrastructure losses experienced due to these events.

Hurricane Katrina has provided perhaps the most compelling visual, emotional and financial impression of the damage a changing climate can inflict on communities. The National Academy of Sciences found that most of the increase in ocean temperature that feeds more intense hurricanes is a result of human-induced global warming. Considering the damage to both community and industrial infrastructure, and resultant flight, unemployment and decreased tax revenue, the total economic impact of Hurricane Katrina to Louisiana and Mississippi is estimated to exceed \$150 billion.<sup>6</sup>

Realizing the powerful ways in which global warming could impact their communities, municipal leaders from across the country are making commitments to reduce GHG emissions from their jurisdictions.

### ***Cities and Counties are Part of the Problem***

As the population and economic centers of the world, urban areas are major consumers of energy and thus major emitters of GHGs. Urban areas are currently growing both in terms of population and geographic area. As they grow, energy demands for supporting daily activities and public and private infrastructure also increase. Land use and development decisions often cause cities and counties to spread outward, resulting in urban sprawl that encourages more driving, increasing fossil fuel consumption, and thus more GHG emissions.

Sprawling patterns of development in urban areas have increased transportation energy use, as well as the need for electricity to power lights and appliances and fossil fuels to heat buildings and fuel industry. Today, cities are such concentrations of energy use that they glow brightly on infrared photos taken from outer space.

In addition to energy use, another large source

*Global Warming: Causes*

**Transportation**

- Engines relying on fossil fuels
- Vehicle use increasing
- Vehicle miles traveled increasing

**Waste**

- Energy lost when materials become waste
- Methane released as waste decomposes

**Energy Use**

- Electricity generated by fossil fuels
- Fossil fuels used for heating and industrial processes
- Electricity use increasing

**Loss of Vegetation**

- Deforestation
- Increased urbanization
- Lack of green space, trees in existing urban areas

<sup>6</sup> Burton, Mark L.; Hicks, Michael J. "[Hurricane Katrina: Preliminary Estimates of Commercial and Public Sector Damages](#)." *Marshall University: Center for Business and Economic Research*. September, 2005.

of GHG emissions is the waste sector. Wasted materials represent greenhouse gas emissions from two sources—the emissions from the upstream processes needed to mine the raw material and manufacture it into a product, and methane released as the organic portions of the wasted materials decompose in landfills.

Local governments have a substantial impact on energy use and waste practices within their communities. The day-to-day decisions made by local governments, the facilities they operate, and the services and infrastructure they provide are significant determinants of the energy consumed, fuel used, and waste generated within their communities.

**Energy use.** The energy load of commercial and residential buildings is affected by building size and location along with the energy efficiency standards followed in building construction and operation. Local governments, through land use and development policies, building codes, and the like have a strong influence on these factors. In the case of municipally-owned utilities, the local government can determine whether the community's energy comes from fossil fuel or renewable energy sources.

**Transportation and land use.** Local government decisions that determine the type of infrastructure that is or isn't provided within a community—whether there are bike lanes, public transit, the type of roads, etc.—contribute to the level of a community's dependency on automobiles. In U.S. cities, energy use in the transportation sector is typically four times higher than in Western European cities—largely due to land use decisions that create sprawl and a lack of effective public transportation options.

**Waste.** Cities and counties usually have responsibility for waste management services, controlling source reduction and recycling programs, collecting waste or operating landfills.

**Local government operations.** Finally, local government operations themselves directly consume large quantities of energy and resources with the myriad facilities, vehicle fleets, parks, street and traffic lights, sewage and water treatment plants, landfills, and other public works that they own and operate.

### ***Cities and Counties are Part of the Solution***

Local governments can use their influence, decision-making and purchasing powers to increase energy efficiency and reduce greenhouse gas emissions. By doing so, cities and counties can also improve air quality, reduce pollution and waste,

*Global Warming: Solutions*

**Local Governments Can:**

- Encourage building and growth that reflect traditional, mixed use neighborhoods rather than sprawl
- Legislate energy-efficient building codes
- Construct public transit systems, pedestrian areas, and bicycle lanes
- Provide reuse, recycling, composting, and other waste reduction services
- Encourage combined or district heating, cooling and power systems
- Plant trees and expand green space
- Buy green, renewable power
- Provide energy saving measures for the community
- Lead by example by maximizing energy efficiency and waste reduction in local government buildings, facilities and operations

create jobs, save money and enhance the quality of life in their communities.

In most parts of the U.S., local governments possess regulatory and economic tools that can make communities greener and more energy and transportation efficient. These powers include land use and zoning decisions, control over building codes and licenses, infrastructure investments, municipal service delivery and jurisdiction over local schools, parks and recreation areas.

In sum, though climate change is a global problem, local authorities have plenty of tools to influence local energy use and greenhouse gas emissions. As the level of government that determines the physical form and spatial structures of a community, and that interacts most closely with people, local governments can affect community energy use in ways that national governments cannot.

### *Cities and Counties Benefit from Acting*

Preventing climate change is not the only, or in some cases even the primary reason local governments are acting to reduce greenhouse gas emissions. Many are drawn to the issue because of local economic, environmental, and community needs. Local governments understand that they can benefit from reducing fossil fuel consumption and increasing energy efficiency—both economically, through lower energy bills, and socially, through improved air quality and more livable communities.

### *Saving Taxpayer Dollars Through Energy Efficiency*

By investing in energy-efficient technologies—from high-mileage or alternative fuel fleet vehicles to energy-efficient public buildings, water and sewage treatment plants and streetlights—cities have dramatically reduced their energy expenses while cutting their contribution to global warming.

### *Investments in Mass Transit: A 6 to 1 return*

Cities that invest in public transportation realize substantial economic benefits. These include increased real estate values, investments in neighborhood development and direct savings for city residents coping with today's high prices at the gas pump. Mass transit also helps improve mobility and opportunities for the elderly -- one of the highest priorities for older Americans. According to the American Public Transportation Association, investments in mass transit provide an economic stimulus far exceeding the original investment, through increased jobs, income profit and tax revenue – as much as six dollars gained for every dollar invested.

### *New Jobs and Businesses in the Clean Energy Industry*

As demand for clean, renewable energy continues to grow, cities that tap into this demand will have a competitive economic advantage. Renewable energy technologies, such as wind and solar power, generate more jobs in construction, manufacturing and installation than fossil fuel-based energy technologies. They also create opportunities for public-private partnerships. As America's fossil fuel supply continues to decline, the importance of investing in clean energy technologies will continue to grow.

### ***Protecting Health and Safety and Reducing Healthcare Costs***

Over 140 million Americans, 25% of them children, live, work and play in areas where air quality does not meet national standards. Harmful motor vehicle emissions account for between 25 and 51% of the air pollutants in these unhealthy neighborhoods. From 2000 to 2002, the number of recorded high-ozone days in the U.S. increased 18.5%.

Pollution-related health ailments bring with them both a human toll and a staggering cost: \$3.2 billion is spent each year treating children under the age of 18 for asthma alone. Unhealthy air is known to trigger asthma attacks. By investing in technologies that reduce pollution, cities and their partners in the business community can improve air quality and decrease and prevent negative health impacts like lung and heart disease, asthma and other respiratory ailments.

### ***Clean Cities Are the 'Best Places to Live'***

Cities that take action to reduce global warming pollution routinely receive local, regional and national acclaim as the best places to raise a family, do business and lead a healthy lifestyle. Popular magazines consistently give the highest marks to cities that have sound and sustainable urban planning, effective mass transit, clean air and energy-efficient buildings - the same measures that reduce global warming pollution.

*"Being green (or clean) can have substantial benefits. Transportation, logistics and the supply chain are best practiced where they do not have to fight traffic jams, pollution and a tattered infrastructure. That goes for people's health as well."*

-- "America's Greenest Cities," 2006 Forbes Magazine

PROOF OF PUBLICATION

LEGAL NEWSPAPER NOTICES

PLANNING COMMISSION/CITY COUNCIL  
PROJECT NOTICING

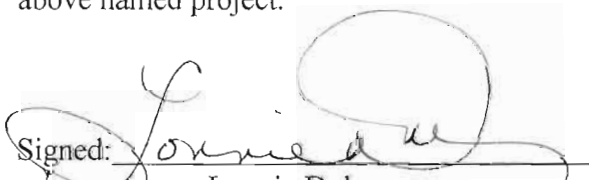
Newspaper: Tribune

Date of Publication: May 7, 2008

Meeting Date: May 20, 2008  
(City Council)

Project: Authorization to prepare a  
Natural Resource and Energy  
Management Plan & Participate  
in the International Council of  
Local Environmental Initiatives  
(ICLEI) Program

I, Lonnie Dolan, employee of the Community  
Development Department, Planning Division, of the City  
of El Paso de Robles, do hereby certify that this notice is  
a true copy of a published legal newspaper notice for the  
above named project.

Signed:   
Lonnie Dolan

forms/newsaffi.691

CITY OF EL PASO DE ROBLES  
NOTICE OF PUBLIC HEARING  
TO AUTHORIZE PREPARATION OF A  
NATURAL RESOURCE AND ENERGY  
MANAGEMENT PLAN  
AND PARTICIPATION IN THE  
INTERNATIONAL COUNCIL OF  
LOCAL ENVIRONMENTAL  
INITIATIVES (ICLEI) PROGRAM

NOTICE IS HEREBY GIVEN that the City Council of the City of El Paso de Robles will hold a Public Hearing on Tuesday, May 20, 2008, at 7:30 p.m. at the City of El Paso de Robles, 1000 Spring Street, Paso Robles, California, in the City Council Chambers, to consider authorizing the preparation of a Natural Resource and Energy Management Plan and participation in the International Council of Local Environmental Initiatives (ICLEI) program.

Written comments on the request to develop the Natural Resource and Energy Management Plan and participation in ICLEI may be mailed to the Community Development Department, 1000 Spring Street, Paso Robles, CA 93446, provided that the comments are received prior to the time of the public hearing. Oral comments may be made at the hearing. Should you have any questions regarding this application, please call Susan DeCarli at (805) 237-3970.

If you challenge the approval to authorize this project in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City Council at or prior to the public hearing.

Susan DeCarli, AICP  
City Planner

May 7, 2008 6719583