

# **Climate Change: What Is It and What Can Planners Do About It?**

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## **Introduction**

Planners have a huge amount of power regarding the future of this planet, right in the palm of their hands — the pencil, the pen, policy and programmatic implementation.

## **History of Global Climate Change**

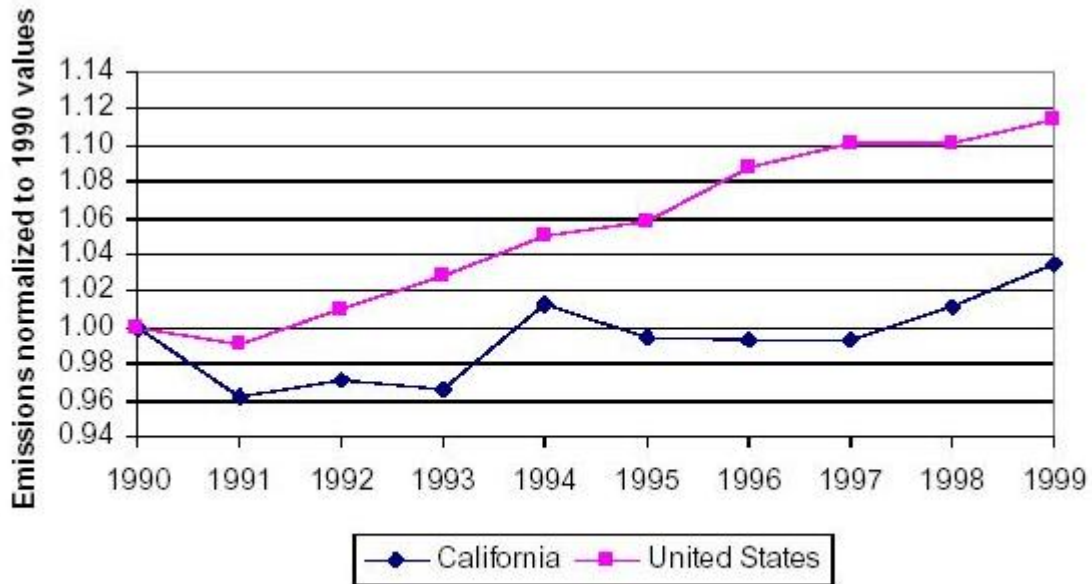
The Living Planet Report, by the World Wildlife Fund, describes how in the past 30 years human demand on natural resources has increased 160 percent while the ability of natural systems to renew themselves has declined 40 percent. People are removing resources from the earth and releasing pollutants into the atmosphere faster than the earth can replenish itself. This increase in greenhouse gases is due largely to human activity. The world's oceans are being over-fished, the forests are being clear-cut, and toxics are being released into the environment. The result of these human activities, combined with the increases in greenhouse gases are resulting in a thinning of the ozone layer – allowing more harmful solar radiation to enter the earth's atmosphere and because of the increase in greenhouse gases much of that energy is trapped causing an overall rise in temperatures. With the earth surface warming world climate change is occurring as evidenced by the polar ice caps melting, extreme weather patterns, increased flooding occurrences, and increased pest and mosquitoes breeding, changes to agricultural production cycles and bird flight patterns.

In 1988, the United Nations created the Intergovernmental Panel on Climate Change (IPCC) to assess scientific, technical and socio-economic information relevant for the understanding of climate change, its potential impacts and options for adoption and mitigation. This group has released three conclusive reports since then confirming the scientific basis of global warming. The Fourth Assessment Report “Climate Change 2007” is due to be published in early February. The early versions predicted that by 2100 the sea level would rise between 5 and 23 inches. The February peer-review journal Science predicts between 20 to 55 inches forecast by 2100. Some critics worry that the IPCC scientists did not take into account the physical expansion of water as it warms, and melting ice sheets which could increase the amount of sea level rise. Recent NASA data shows that Greenland is losing 53 cubic miles of ice each year – twice the rate it was losing in 1996. According to the National Oceanic Society, water infiltration of sea water into our Delta fresh water is a strong possibility threatening the water supply for two-thirds of all Californians and millions of acres of irrigated farmland.

The panel goes on to predict temperature rises of 2-11.5 degrees Fahrenheit by the year 2100. The report states that global warming is very likely not due to known natural causes alone, which translate to more than a 90 percent certainty that global warming is caused by man's burning of fossil fuels.

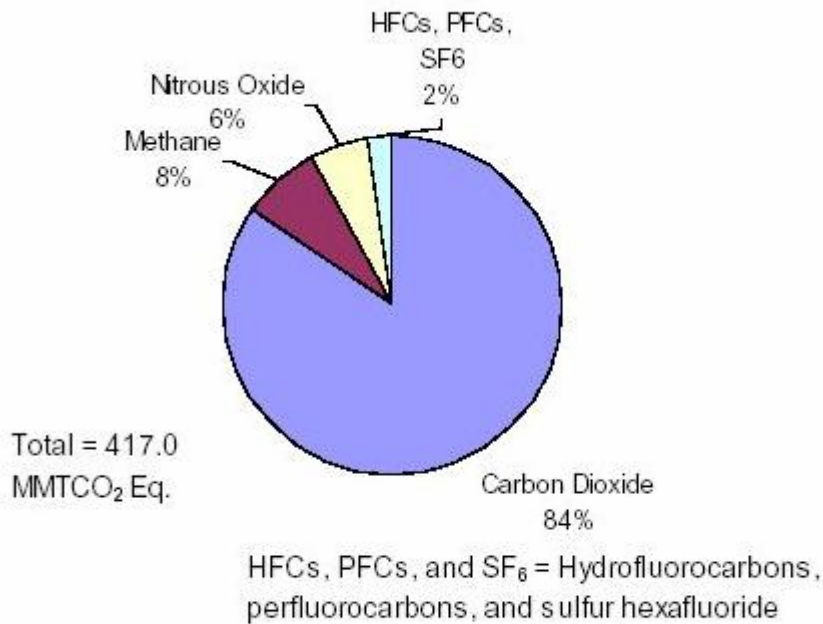
Over the last 10 years U.S. and California greenhouse gas emissions are increasing exacerbating

the problem. The United States each year contributes about a quarter of the world's greenhouse gases. According to the State of California, the California and United State greenhouse gas emissions continue to rise.



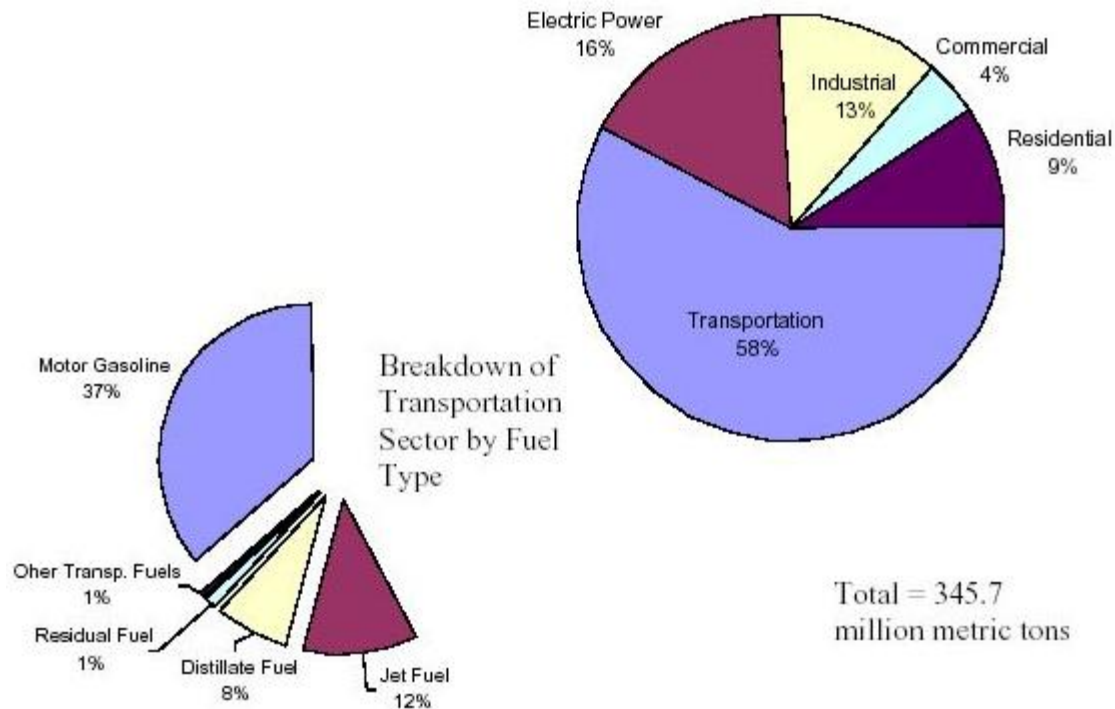
**Figure ES-4: 1990-1999 Relative Gross Greenhouse Gas Emissions (excluding marine bunker fuels)**

The distribution of California greenhouse gas emissions in 1999, 84 percent was caused by carbon dioxide.



**Figure ES-6: Distribution of California Greenhouse Gas Emissions by Gas in 1999 (excluding marine bunker fuels)**

Of the 84 percent, 58 percent is caused from the transportation sector, with 37 percent of that from motor gasoline. The second highest cause of California greenhouse gas emissions is electric power (16 percent) and industrial, residential and commercial uses (13 percent, 9 percent and 4 percent respectively).



### What Is the Federal Government Doing about Global Warming?

President Bush rejected the Kyoto Protocol in 2001, an international treaty requiring 35 industrial nations to cut their global-warming gases by 5 percent on average below 1990 levels by 2012. The White House has said the treaty would have cost 5 million U.S. jobs. Energy Secretary Samuel Bodman said in February that “the imposition of a carbon cap in this country may lead to the transfer of jobs and industry abroad (to nations) that do not have such a carbon cap”. Bush has called for slowing the growth rate of U.S. greenhouse gas emissions, but has rejected government-ordered reductions. In February, he called for a 20 percent reduction in U.S. gasoline consumption over the next 10 years.

According to the U.S. Green Building Council, President Bush released an Executive Order on January 24, 2007, which calls for the head of each Federal agency to reduce “energy intensity” (energy consumption per square foot of building space) by 3 percent annually through the end of fiscal year 2015, or 30 percent by the end of the fiscal year 2015. The Executive Order establishes goals for all new construction and major renovations of agency buildings in accordance with green building strategies such as resource conservation; use of recycled materials; building site selection; and indoor environmental quality. The Green Building Rating System, a nationally accepted standard for green building design, construction, and operations, has been adopted by 11 Federal government agencies. In addition to establishing goals for building performance, the Executive Order sets environmental targets in the areas of purchasing and acquisition, renewable energy, toxics reductions, recycling, renewable energy, electronics equipment, fleets, and water conservations.

Announced in June 1997, the U.S. Department of Energy, the Million Solar Roofs (MSR) Initiative aims to encourage the installation of solar energy systems on one million U.S. buildings by 2010. The initiative concentrates on two types of solar technology: solar electric systems (or photovoltaic's) that produce electricity from sunlight and solar thermal that produce heat for domestic hot water, space heating, or heating swimming pools. The Million Solar Roofs Initiative has awarded some local jurisdictions grant funds to provide free technical assistance to residents and businesses.

President Bush's FY 2006 Budget proposes \$5.5 billion for climate-change programs and energy tax incentives. This figure includes nearly \$4 billion for the Climate Change Technology Program, nearly \$2 billion for the Climate Change Science Program and \$3.6 billion over 5 years for renewable energy tax incentives for technology. A portion of the Science program focuses on enhancing and improving the Department of Energy's greenhouse gas emission reduction registry. These tax incentives include credits for residential solar heating systems, electricity produced from alternative energy sources, energy produced from landfill gas and the purchase of hybrid and fuel-cell vehicles. Local governments can and are taking advantage of these tax incentives by offering technical assistance and referring companies and homeowners to the rebates and other incentives. The credits for hybrid and fuel-cell vehicles are smartly being used for local government fleet vehicle purchases.

The Secretary of Agriculture announced in 2003 their interest in encouraging the increased use of biomass energy, practices that reduce emissions from agriculture, and sustainable forest management.

### **What Is the State of California Doing about Global Warming?**

In his Environmental Action Plan, Governor Schwarzenegger signed an Executive Order on June 1, 2005, which established statewide greenhouse gas emission targets and directed the Secretary of the California Environmental Protection Agency to achieve the following targets:

- By 2010, reduce to 2000 emission levels
- By 2020, reduce to 1990 emission levels
- By 2050, reduce to 80 percent below 1990 levels

The California Global Warming Solutions Act of 2006 (AB 32) establishes among other things a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reduction of greenhouse gases (GHG). It makes the Air Resources board (ARB) responsible for monitoring and reducing greenhouse gas emissions. It requires ARB to establish a statewide GHG emissions cap for 2020, based on 1990 emissions and adopt mandatory reporting rules for significant sources of GHG by January 1, 2008.

According to the California Energy Commission, in 2004, 10.2 percent of all electricity came from renewable resources such as wind, solar, geothermal, biomass and small hydroelectric facilities. Large hydro plants generated another 14.9 percent of our electricity. In 2002, California established its Renewable Portfolio Standard Program, with the goal of increasing the percentage of renewable energy in the state's electricity mix to 20 percent by 2017. Many

counties and cities are taking advantage of the various grants being offered by the California Energy Commission to complete local renewable energy programs.

In January 2006, the California Public Utilities Commission created the California Solar Initiative (CPUC ruling - R.04-03-017) which moves the consumer renewable energy rebate program for existing homes from the Energy Commission to the utility companies under the direction of the CPUC. This new incentive program, for renewable systems of less than one megawatt, begins in January 2007 and provides a total of \$2.9 billion over ten years. Local communities should take advantage of this funding source to conduct their own renewable energy incentive programs. The P.G. & E. Pacific Energy Center in San Francisco is an excellent resource including advice and information, an energy library and educational programs for staff and the public.

Beginning in 2007, the California Energy Commission began offering \$350 million targeted for new residential building construction. It will use funds already allocated to the Energy Commission to foster renewable energy projects between 2007 and 2011. Called the New Solar Homes Partnership, it will focus on new residential construction. This funding could be used by a local agency to incentivize local green building programs (more on green building below).

The State of California Climate Change Portal has a variety of resources including the West Coast Global Warming Initiative, an agreement between Oregon, Washington and California on greenhouse gas reduction. It also includes research, carbon emissions inventory information and other funding sources.

### **ABAG and Global Warming Reduction**

The *Bay Area Vision* project is a multi-agency project including ABAG, MTC and BAAQMD, which builds on the Smart Growth Strategy Livability Footprint from 2002. Its main goal is to shift development toward more compact and connected development pattern. The project proponents have correctly introduced global climate change and its connection between land use and transportation planning. It further goes on to identify carbon emissions, particularly from vehicles as a major contributor. I recommend that the baseline carbon emissions be determined for the entire nine-bay area counties as well as for each county. The carbon emission data could be segregated by main contribution so that policies and programs can be geared toward reduction in that area.

ABAG will develop incentives to encourage cities to participate in the program. Depending upon the incentives they develop they could identify the estimated carbon reduction of the incentives thereby quantifying which incentives had the greatest reduction of carbon emissions so that incentives could be prioritized accordingly.

New rounds of Regional Housing Needs Allocation and Housing Element Updates are underway. ABAG's focus on transit oriented development emphasizing the values of transportation choices, existing infrastructure, social equity and homes for all income levels is critical to carbon emissions reduction in the Bay Area.

The Bay Area Green Business Program was developed by the Association of Bay Area Governments in collaboration with US EPA, Cal EPA Department of Toxic Substances Control and the business community. The Program is a voluntary partnership among business leaders, government agencies and nonprofit organizations and recognizes and promotes businesses that demonstrate continuous compliance with applicable environmental regulations and conserve energy, water, and other materials. The Program is currently offered in Alameda, Contra Costa, Marin, San Francisco, Santa Clara and Sonoma counties.

In January, ABAG report, entitled *Natural Hazards and Climate Change —Risk Management and Public Policy Opportunities*, examines the impacts of climate change and options for local government. The report details implementation of strategies identified in the multi-jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area

ABAG could continue to integrate more considerations regarding global climate change into its other programs including the Emergency Planning for the Bay/Delta Levee Failure program, the Critical Coastal Areas Pilot Projects, the Bay Trail and its Corridors Projects. Its regional GIS could be an asset to show local sea level rise, to conduct solar potential mapping, and carbon emissions calculations and monitoring.

### **What Can Cities and Counties Do about Global Warming?**

Planning sustainable communities is of global importance, as distant decisions can affect the health of natural systems and consequently human well-being. Furthermore, the carrying capacity of an ecosystem, city, or bioregion is also affected by land use planning and human resource consumption. To accomplish this it will be necessary to make significant changes in the way communities process and consume resources, a shift sometimes referred to as an “ecological U-turn.”

The American Planning Association Board of Directors ratified their policy on planning for sustainability on April 17, 2000. They identified the following four objectives in the Policy Guide on Planning for Sustainability and relate very directly to global climate change and carbon reduction:

1. Reduce dependence upon fossil fuels, extracted underground metals and minerals.
2. Reduce dependence on chemicals and other manufactured substances that can accumulate in Nature.
3. Reduce dependence on activities that harm life sustaining ecosystems.
4. Meet the hierarchy of present and future human needs fairly and efficiently.

Cities and Counties are a major contributor to greenhouse gas emissions and through their policy framework on energy, transportation, recycling/waste, open space, agriculture/food security, and land use can significantly reduce greenhouse gases.

One way local jurisdictions can reduce climate change is to participate in the Mayors for Climate Protection program. The program was created by Mayors in the United States who have committed their cities to reducing greenhouse gas emissions either through:

- The Cities for Climate Protection Campaign (CCP) or
- The US Mayors Climate Protection Agreement

So far, over 300 Mayors, representing more than 50 million Americans have signed the U.S. Mayors Climate Protection Agreement.

Under the Agreement, participating cities commit to take the following actions:

- Strive to meet or beat the Kyoto Protocol targets in their own communities, through actions ranging from anti-sprawl land-use policies to urban forest restoration projects to public information campaigns;
- Urge their state governments, and the federal government, to enact policies and programs to meet or beat the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol — 7 percent reduction from 1990 levels by 2012; and
- Urge the U.S. Congress to pass the bipartisan greenhouse gas reduction legislation, which would establish a national emission trading system

Once cities make the commitment to participate in the CCP Campaign, ICLEI provides software and technical assistance. Experienced ICLEI staff members help local government officials act on climate protection through a process marked by 5 milestones:

1. Conduct a baseline emissions inventory and forecast.
2. Adopt an emissions reduction target for the forecast year.
3. Develop a Local Action Plan.
4. Implement policies and measures.
5. Monitor and verify results.

According to the Mayor for Climate Protection website there are many ways cities prosper from climate action through their investment in mass transit; commitment to clean, renewable energy; improved public health from cleaner air; and new partnerships with the private sector all result in greater economic prosperity for its citizens. They also make a city a cleaner, safer, more desirable place to live. The following four economic benefits are listed from cities making investments in these changes:

#### 1. 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.

#### 2. Investments in Mass Transit: A 6 to 1 return

Cities that invest in public transportation realize substantial economic benefits. They 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.

### 3. 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.

Cities promote the development of the clean energy industry in two ways: through agreements to purchase clean energy and by creating incentives for utilities, businesses and ratepayers to opt for clean energy sources. Many businesses are realizing the economic benefit of switching to renewable energy sources. Hundreds of major U.S. corporations already rely on clean, renewable energy for a growing portion of their energy needs. Cities and towns with policies that promote renewable energy sources will continue to attract the many businesses joining this trend.

### 4. Protecting Health and Safety and Reducing Health Costs

Over 140 million Americans, 25 percent 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 percent 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 percent.

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.

Besides the Mayor for Climate Protection program, many cities and counties have decided that their actions can greatly reduce greenhouse gas emissions through various recycling, green building, green business, and energy efficiency programs. Many jurisdictions "Think Globally, Act Locally" and have very effective programs including the counties of Marin, San Mateo, San Francisco, Alameda and the cities of San Jose, Pleasanton, Berkeley, Oakland, and Santa Monica in California; Seattle; Portland, Oregon; Austin, Texas; New York City, and I'm sure many more.

The programs typically include incentives, changes to codes and standards, pilot projects, education and outreach, and permitting changes.

#### Green Building

One way a local jurisdiction can reduce its greenhouse gas emissions is the operation of a Green Building program. According to the U.S. Green Building Council (USGBC) buildings consume 40 percent of raw materials, 48 percent of U.S. carbon emissions, 70 percent of U.S. electricity,

while green buildings save 70 percent of solid waste, 40 percent of water, and 35 percent of carbon emissions and between 30-50 percent of energy.

Green buildings are healthier, have a smaller environmental footprint, use less energy, and cost less to operate. Green building is the convergence of three fundamental objectives:

1. Conserve natural resources.
2. Increase energy efficiency.
3. Improve indoor air quality.

Green Building practices applies to a building site as well as the building materials. Conventional building practices consume large quantities of wood, plastic, cardboard, paper, water and other natural resources. The generation and use of energy are major contributors to air pollution and global climate change. Improving energy efficiency and using renewal energy sources are effective ways to reduce the impacts of global warming.

Many jurisdictions run a Green Building Program including Marin County, City of San Jose, San Mateo County, City of Pleasanton, Los Angeles, Santa Monica, West Hollywood, Santa Clarita, Irvine, and San Francisco. The programs vary by jurisdiction and an example of what is offered:

- Green Building Guidebook,
- Technical assistance,
- Website information,
- Training and education of architects, builders and staff on green building techniques,
- Requirement that government buildings receive Green Building certification,
- Construction and Demolition Waste Recovery ordinances,
- Energy Efficiency ordinances, and
- Adding the Green Building Rating System to their Design Review Findings.

Global Green offers a Local Government Green Building Initiative to assist with needs analysis and strategic planning, design of a Green Building Program and workshops and training.

The U.S. Green Building Council (USGBC) is a coalition of leaders from every sector of the building industry. With over 7,800 members and 75 regional chapters they created the LEED certification which is a voluntary, consensus-based national rating system for developing high-performance, sustainable buildings. LEED addresses all building types.

USGBC provides educational offerings on green design, construction, and operations for professionals from all sectors of the building industry. A LEED Accredited Professional™ has detailed knowledge of LEED project certification requirements and processes by successfully passing a comprehensive exam.

In November, the USGBC unveiled specific climate actions to have an immediate and measurable impact on carbon reduction including developing a carbon dioxide offset program to track and quantify the emissions and reductions from LEED (Leadership in Energy and Environmental Design) projects. In addition, all new commercial LEED projects are required to

reduce carbon dioxide emissions by 50 percent when compared to current levels. USGBC has committed by the end of 2007 to become a 100 percent carbon neutral organization.

### Green Business

Local jurisdictions could operate their own local Green Business Program and decide whether they want to have create a more difficult certification standard, like Marin Counties Sustainable Partners program which require business to meet the basic requirements and additional environmental impact reduction efforts, employee welfare and benefit policies, and corporate philanthropy practices

### Renewable Energy Programs

Renewable energy doesn't depend on foreign oil sources and are mainly derived from wind, water (tidal and hydroelectric), waste (methane), and solar. Jurisdictions should proactively consider these various forms of renewable energy sources and how they could be enhanced in their Zoning Ordinances, permitting processes and proactively set-out to train their employees on the technologies. Vote Solar in San Francisco has a goal to bring solar energy into the mainstream. They have a variety of free resources to assist cities in building demand for solar on public and private buildings and on new home buildings. They also feature case studies of successful solar on public buildings.

The P.G. & E. Pacific Energy Center in San Francisco offers a variety of energy resources including advice and information, a library and educational program.

### General Plans and Zoning Ordinances

General Plans have the potential to significantly reduce global warming through land use placement and density, building design, energy and circulation policies. Cities can begin by establishing global warming reduction goals that set forth the intent of using renewable energy, fuel-efficient transportation, and green building and business practices.

Cities can benchmark their contribution to greenhouse gas emissions and based upon the type of land use which creates the greatest contribution to their local emissions focus their policies on the area of needed reduction.

Although California planning law doesn't require incorporating "indicators," benchmarks, and "targets" in General Plans they can be used to set policy direction and to monitor progress. They can also be used to provide an opportunity to consider the need for new or revised General Plan strategies or implementation measures.

The range of ordinances which could be developed is endless, if planners are creative. Many jurisdictions have developed Construction and Demolition Waste Recovery ordinances to require mandatory re-use or recycling of construction waste. Energy Efficiency ordinances are relatively new and cutting-edge, essentially requiring buildings that exceed a particular size not generate more energy than a much smaller sized building thus requiring the building be designed to exceed Title 24 requirements and potentially install renewable energy sources to fill the gap. Other cities are looking at ways to reduce the permitting requirements for renewable energy technologies.

### What is Carbon Trading?

According to the Feb/March 2007 issue of *Plenty* magazine, in January 2003, the giant chemical manufacturer DuPont became a founding member of the Chicago Climate Exchange (CCX), the nations only voluntary greenhouse gas emissions trading marketplace. The founders believed that the most effective way to fight global warming is a carbon dioxide cap-and-trade system. The “cap” refers to an overall limit on the amount of carbon a particular company, city, state, or country can produce. A member of CCX sets reduction targets and if the member has extra allowances they can be sold and make a profit. If they don’t meet the reduction requirements they must either buy allowances from other or purchase “offsets” – credits from approved sources, such as an organization that plant trees.

In August, several environmental organizations, including Environmental Defense and the Natural Resources Defense Council, drafted a letter urging cities and states to enact their own more stringent programs, because the exchange’s standards weren’t tough enough. For example, a company that constructs new facilities after joining CCCX can exempt one of those new buildings from the carbon reduction rules it has agreed to.

The California Climate Action Registry, a state-backed, voluntary registry allows organizations to record their greenhouse gas emissions. The registry doesn’t require any emissions reductions, its organizers hope that tracking data will lead to cutbacks.

### **Conclusion**

Planners have the ability to integrate into their land use planning sensible policies and programs to significantly reduce global warming. Let’s step up to the challenge and do our part to protect this world for our children’s children and leave it in a better way than when we got here.

*Michele Rodriguez was the principal in charge of the Marin Countywide Plan update which is the first general plan in the nation with the overarching theme of sustainability.*

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