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The Impact of Global Warming on Land Use Planning: the California and Colorado Experiences

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RMLUI Land Use Conference

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AB 32: The Blueprint

The California Air Resources Board (CARB) has issued the final version of its Scoping Plan as required under Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 calls for a reduction by 2020, of greenhouse gas emissions (GHG emissions) in the State of California to levels recorded in 1990. This represents an approximate reduction of 30% over the next 12 years.

CARB's prior Draft Scoping Plan received thousands of comments from the general public and many of the State's agencies as well. The final version of the Scoping Plan is likely to be approved in December, 2008 by CARB and soon after, drafting of regulations will commence.

The final version is over 150 pages long and accompanied by thousands of pages of appendices and additional studies. Included in these appendices is a public health analysis indicating a positive public health benefit will occur from lowering GHG emissions; as well as an economic analysis stating a significant net positive economic outcome will occur from the application of AB 32.

Key Differences Between Draft and Final Version of AB 32

- **Regional Transportation Targets** - CARB re-evaluated the potential benefits of targeting transportation-related greenhouse gases and has therefore recalculated the targets for GHG emissions savings from 2 million metric tons to 5 million metric tons of CO2 equivalent. This recalculation may put additional stress on savings from this sector so as to meet this target.

- **Local Government Targets** - CARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure municipal and community-wide emissions match the State's reduction target. Thus, local governments will not have to meet a lower threshold of savings than other entities.

- **Additional Industrial Source Measures** - CARB added additional measures to address emissions from industrial sources. These proposed measures will regulate emissions from oil and gas recovery and transmission activities, reduce refinery flaring, and require control of methane leaks at refineries.

- **Recycling and Waste Re-Assessment** - CARB has increased the anticipated reduction of GHG emissions from the Recycling and Waste Sector.

- **Green Building Sector** - The final version of the Scoping Plan allows for a larger reduction from this source. This insures that stricter than anticipated statewide building standards will be promulgated.

- **High Global Warming Potential (GWP) Mitigation Fee** - Currently many of the chemicals with very high Global Warming Potential (GWP) - typically older refrigerants and foam insulation products - are relatively inexpensive to purchase. CARB has thus included a Mitigation Fee measure to better reflect their impact on the climate.

- **Modified Vehicle Reductions** - CARB lowered the expected emissions reduction of greenhouse gases as a result of the Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency) measure and the Tire Inflation measure.

- **Discounting Low Carbon Fuel Standard Reductions** - CARB has reduced the expected emission reductions of the Low Carbon Fuel Standard because it overlaps in claimed benefits with California's clean car law (the Pavley greenhouse gas vehicle standards).

Personal Action

CARB is asking for all citizens to consider climate change and their personal carbon footprint as they make decisions about travel, work, and recreation. CARB points to the success of Californians separating their garbage into waste and recyclables for the last 2 decades and thus, believes the population will comply because their desire to have a cleaner more efficient economy will produce a wide range of benefits to individuals, through lower energy bills and a healthier environment. CARB also believes that consumers and businesses will save money and reduce GHG emissions by conserving resources at homes, offices and commercial buildings.

Rulemaking

CARB will be drafting regulations over the next two years and must balance the following issues:

- Encourage early actions that do not disproportionately impact low-income and minority communities;
- Ensure that AB 32 programs complement and do not interfere with the attainment and maintenance of ambient air quality standards already in effect and addressed by the Clean Air Act;
- Strive to consider the overall societal benefits, minimize the administrative burdens, and minimize the potential for leakage.

Cap and Trade

In terms of cap and trade and other market based compliance systems, CARB must consider the potential for direct, indirect and cumulative emission impacts from those systems, including communities that are already adversely impacted by air pollution. As data becomes available, CARB is required to consult with outside experts and the Environmental Justice Advisory Committee, which to date has generally not been in favor of market based systems.

Looking Forward

Governor Schwarzenegger signed Executive Order S-3-05 calling for an 80 percent reduction below 1990 greenhouse gas emission levels by the year 2050. This is based on the assumption from scientists that the 2050 target represents the level of greenhouse gas emissions that advanced economies must reach if the climate is to be stabilized in the latter half of the 21st century. CARB outlined the basic concerns in reaching that goal by looking at the year 2030. CARB states; "An additional challenge comes from the fact that California's population is expected to grow by about 12 percent between 2020 and 2030. In order to counteract this trend, per-capita emissions must decrease at an average rate of slightly less than five percent per year during the 2020 to 2030 time period."

To reach this level, which CARB predicts is possible, the following will have to occur:

- Using a regional or national cap-and-trade system to further limit emissions from the 85 percent of GHG emissions in capped sectors (transportation fuels and other fuel use, electricity, residential/commercial natural gas, and industry);

- Achieving a 40 percent fleet-wide passenger vehicle reduction by 2030, approximately double the almost 20 percent expected in 2020;
- Increasing California's use of renewable energy;
- Reducing the carbon intensity of transportation fuels by 25 percent (a further decrease from the 10 percent level set for 2020);
- Increasing energy efficiency and green building efforts so that the savings achieved in the 2020 to 2030 timeframe are approximately double those accomplished in 2020; and
- Continuing to implement sound land use and transportation policies to lower VMT and shift travel modes.

While CARB concludes that to reach these goals will require a great deal of "flexibility" what it will really require is a fundamental shift in how everyone leads their life.

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California's Sweeping Greenhouse Gas Reduction Plan Leaves Some Issues Unanswered

On June 26, 2008, The California Air Resources Board (CARB) issued its draft "scoping plan" to implement the Nation's first state greenhouse gas (GHG)-reduction program. Virtually every sector of the state's economy would be affected by the air board's plan, including coal-fired power plants, oil refineries, and landfills. The plan also recommends imposing a fee on large polluters in order to raise $50 million each year to help administer various new regulations and programs. These plans will impact consumers with higher prices for fuel and electricity.

While the 99 page document is sweeping in its scope and comprehensive in seeking numerous ways to reduce California's GHG emissions, it does not clarify several major issues, including the scope of use of offsets, the assessment of carbon fees, and how to credit for "early action." The plan also does not explain how the state will distribute GHG emission allowances under its cap-and-trade program, nor does it offer recommendations for how to use the revenue from potential allowance auctions.

All these issues are going to be debated as the critical time of November 2008 approaches when the CARB is scheduled to adopt a final plan. This plan is required under the state's landmark 2006 global warming law, AB 32 and is likely to be viewed as a model for other states and perhaps the Nation.

For a more complete analysis of The California Air Resources Board draft scoping plan, visit http://www.bhfs.com/NewsEvents/Publications/.

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Summary of Climate Change Draft Scoping Plan Prepared by The California Air Resources Board Pursuant to AB 32

The California Resources Board's (CARB) Draft Scoping Plan proposes a sweeping set of actions which CARB believes will reduce overall carbon emissions in California, improve the environment, reduce dependence on oil, diversify our energy sources, save energy, enhance public health and create new jobs to enhance California's economy. CARB will revise the Draft Plan based on continuing analysis and public input, and will release the Proposed Scoping Plan in early October of this year, to the agency's Board for consideration at its meeting in November, 2008. The measures in the Scoping Plan adopted by the Board will be developed over the next three years and be in place by 2012.

CARB Proposed Action: Expand and strengthen existing energy efficiency programs, building and appliance standards

Buildings are the second largest contributor to California's greenhouse gas emissions. Green buildings offer a comprehensive approach to reducing greenhouse gas emissions that cross-cut multiple sectors including energy, water, waste, and transportation. Achieving significant GHG emissions from the building sector will require a combination of green building measures for new construction and existing buildings. The State of California will likely set an example by requiring all new State buildings to exceed existing energy standards and meet nationally-recognized sustainability standards such as Leadership in Energy and Environmental Design (LEED) Gold standards.

CARB Proposed Action: Expand the Renewables Portfolio Standard to 20 percent

The California Energy Commission (CEC) estimates that about 12 percent of California's retail electric load is currently met with renewable resources. CARB intends to increase the share of renewables in investor owned utilities electricity portfolios to 20 percent by 2010 while publicly-owned utilities are encouraged but not required to meet the same goal.

CARB Proposed Action: Develop a California cap-and-trade program that links with other Western Climate Initiative (WCI) Partner programs

Cap and trade is a market-based approach that caps the total amount of GHG emissions and allows certain covered sources to find the least expensive way to comply. Emissions in the cap are denominated in metric tons of CO_2. The currency would be in the form of allowances the State would issue based upon the total emissions allowed under the cap during any specific compliance period. These allowances could be freely distributed to capped firms or auctioned in the trading market.

CARB Proposed Actions:

- Expand existing energy efficiency programs
- Renewables Portfolio Standard to 20%
- California cap-and-trade program
- Implement State laws and policies
- Fees to fund the State's commitment to AB 32
- Offsets

Other Proposed Actions Pertaining to:

- Transportation
- Energy
- Industry
- De Minimis Threshold

California is working closely with other states and provinces in the WCI to design a regional cap-and-trade program that can deliver GHG reductions throughout the region. Regulations to implement the cap-and-trade system would need to be developed by January 1, 2011, based on the authority and requirements of AB 32, with the program beginning in 2012.

CARB Proposed Action; Implement State laws and policies, including clean car standards, goods movement measures, and the Low Carbon Fuel Standard

- *California Light-Duty Vehicle GHG Standards*

  Assembly Bill 1493 (Pavley, 2002) directed CARB to adopt vehicle standards that lowered greenhouse gas emissions to the maximum extent technologically feasible, beginning with the 2009 model year, and follow up with further, more stringent, regulations. Under federal law, California is the only state allowed to adopt its own vehicle standards (though other states are permitted to adopt California's more rigorous standards), but California cannot implement the regulations unless U.S. EPA grants an administrative waiver. This wavier has been denied by the U.S. EPA and is the subject of ongoing litigation.

- *Develop and adopt the Low Carbon Fuel Standard*

  Because transportation is the largest single source of greenhouse gas emissions in California, the State is taking an integrated approach to reducing emission from this sector. Beyond including vehicle efficiency improvements and lowering vehicle miles traveled, the State is attempting to reduce the carbon intensity of motor fuels consumed in California by calling for the development of such a fuel and pursuing various economic and statutory avenues to reach this goal.

- *Vehicle Efficiency Measures*

  CARB is pursuing regulation to ensure that tires are properly inflated when vehicles are serviced and is developing a tire tread program to create minimum fuel-efficient tire standards. CARB is also pursuing ways to reduce engine load via lower friction oil and reducing the need for air conditioner use.

- *Goods Movement*

  A significant portion of the transportation activities are associated with the movement of freight or goods throughout the state. CARB has already adopted a regulation to require ship electrification at ports.

- *Heavy/Medium-Duty Vehicles*

  The State is working on adoption of regulations requiring changes in engine design and engine management for heavy and medium duty trucks. Regulations requiring retrofitting to improve the fuel efficiency of heavy-duty trucks are likely to include devices that reduce aerodynamic drag and rolling resistance. Hybridization will be sought to reduce greenhouse gas emissions again through increased fuel efficiency.

- *Support implementation of a high speed rail system*

  CARB is committed to the creation of a high speed rail system initially connecting San Francisco and Anaheim.

- *Adopt measures to reduce high global warming potential gases from both mobile and stationary sources*

  Chemicals with high global warming potential (GWP) are very common and are used in many different applications such as refrigerants in air conditioning systems, fire suppression systems, and the production of insulating foam. Because these gases have been in use for years, old refrigerators, air conditioners and foam insulation represent a significant "bank" of these materials yet to be released. High GWP gases are released in two primary ways: (1) through leaking refrigeration systems and (2) during the disposal process. Measures to address this problem will take the form of regulations and/or fees.

- *Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation*

  The State has set 2020 as the target for California's forest lands to achieve a specified reduction through sustainable management practices, including reducing the risk of catastrophic wildfire, and the avoidance or mitigation of land-use changes that reduce carbon storage. The State is requesting the federal government must do the same for lands under its jurisdiction in California. At this time, California forests are now a net carbon sink. The 2020 target would provide a mechanism to help ensure that this carbon stock is not diminished over time.

- *Continue efficiency programs and use cleaner energy sources to move water.*

  Water use requires approximately one-fifth of the electricity and a third of the non-power plant natural gas consumed in the state. More efficient use of water could reduce demand and reduce greenhouse gas emissions. To support this increase in efficiency already underway by various water suppliers and users, the State will also establish a public goods charge for funding investments in water efficiency that will lead to reductions in greenhouse gases.

- *Million Solar Roofs Program*

  California has set a goal to install 3,000 megawatts (MW) of new, solar-electric systems by 2017. The Million Solar Roofs Initiative is a ratepayer-financed incentive program aimed at transforming the market for rooftop solar systems by driving down costs over time. Obtaining the incentives requires the building owners or developers to meet certain efficiency requirements specifically, new construction projects meet energy efficiency levels that exceed the State's Title 24 Building Energy Efficiency Standards, and that existing commercial buildings undergo an energy audit.

- *Local Government Actions and Regional Targets*

  CARB wants to create a system of cooperative measures with local government that accomplish the following:

  - Use integrated scenario modeling to align regional transportation plans and local general plans
  - Takes into consideration other State policy goals
  - Incorporates performance indicators to monitor progress
  - Coordinates local and regional planning efforts to achieve maximum reductions
  - Establishes priorities for and direct State resources to help local and regional governments meet the regional greenhouse gas targets

  CARB continues to work with the Governor's Office of Planning and Research to ensure that the California Environmental Quality Act (CEQA) will provide recognition of projects that are consistent with general plans aligning with blueprints that meet regional greenhouse gas targets.

- *Increase waste diversion, composting, and commercial recycling, and move toward zero-waste*

  Landfill material produces methane emissions which can be captured and controlled and can be used as a fuel. In addition, capturing this methane can result in air quality benefits as other landfill gases, such as volatile organic compounds, are also captured and removed. Increasing waste diversion from landfills beyond the current rate provides additional recovery of recyclable materials. This will directly reduce greenhouse gas emissions by re-introducing recyclables with intrinsic energy value back into the manufacturing process, and indirectly by reducing the need for virgin materials extraction.

- *Agriculture*

  In the near-term, CARB is encouraging investments in manure digesters and at future Scoping Plan updates, CARB will determine if the program should be made mandatory by 2020. Initially, economic incentives such as marketable emission reduction credits, favorable utility contracts, or renewable energy incentives will be needed. The use of nitrogen fertilizers which produce N2O emissions is the other significant source of greenhouse gases in the Agricultural sector.

- *Energy Efficiency and Co-Benefits Audits for Large Industrial Sources*

  This measure applies to major industrial facilities with more than 25,000 metric tons of CO2 per year of greenhouse gas emissions. CARB would implement this measure through a regulation, requiring each facility to conduct an audit of the energy efficiency of individual sources within the facility to determine the potential to reduce greenhouse gases, criteria air pollutants, and toxic air contaminants. The audit would include an assessment of the impacts of replacing or upgrading, older, less efficient units such as boilers and heaters, or replacing the units with combined heat and power units. The results of the audit will determine if certain emissions sources within a facility can make cost-effective GHG reductions that also provide needed reductions in other criteria or toxic pollutants. Where this is the case, rule provisions or permit conditions would be considered to ensure the best combination of pollution reduction.

CARB Proposed Action; Targeting fees to fund the State's long-term commitment to AB 32 administration

Carbon fees are viewed as having two distinct roles in implementing AB 32: (1) Fees can be used as a tool to incentivize emission reductions by affecting the relative prices within the economy and (2) Fees would also provide a source of revenue to pay for reductions or achieve other goals related to the program. Certain targeted fees are also likely to be included to help pay for implementation of some of the measures included in the Plan. Fees could be widely applied to most emissions sources, likely generating billions of dollars per year in revenue that could be directed toward various purposes, including programs that achieve GHG emission reductions more directly. Every $10 per ton, if placed on all emissions of GHGs in California, would result in more than $4 billion per year through the life of the program. The revenue generated through broad or targeted carbon fees could be used for providing incentives for additional reductions, investment in efficiency and renewables, research and development and deployment of green tech, mitigation of consumer price increases.

CARB Proposed Action: Offsets

CARB realizes that individual activities that are not easily addressed under regulatory approaches can nevertheless result in cost-effective, real, additional, and verifiable GHG reductions. These projects can generate "offsets," i.e. verifiable emission reductions whose ownership can be transferred to others. Offsets are generally separated into two types – compliance offsets and voluntary offsets.

- *Compliance offsets*

  If offsets are used for compliance purposes, CARB asserts that the reductions must be "real, additional, verifiable, enforceable and permanent." Offsets provide opportunities for the most cost-effective reductions to be pursued early in the program, which can help meet the AB 32 emission reduction target sooner and at a lower-cost. By lowering overall costs, an offset program can serve to encourage GHG emission reductions from sources not covered by a regulation or cap and-trade system which can further spur innovation in unregulated sectors.

- *Voluntary offsets*

  These transactions are largely completed by offset retail providers who either transfer the money to a fund that generates emission reduction credits by financing projects and then retiring them, or sends the credits for retirement to organizations that find solutions for climate change. A number of major companies have also established 'carbon neutral' policies, under which they seek to minimize their GHG emissions to the extent possible, and buy voluntary offsets. As specified in AB 32, CARB will adopt methodologies for quantifying voluntary reductions.

Other Possible Actions

CARB is considering many other options which may be added as other action items in future drafts of the Scoping Plan. These include:

Transportation

- Provide rebates for low emission vehicles with a fee program for high-emitting vehicles.
- Create a congestion pricing program charging a price, or toll, for traveling during peak hours on congested routes.
- Create a Pay-As-You-Drive program where insurance premiums are set based on driving record and other traditional risk factors, but are broken down into per-mile charges.

Energy

- CARB is working with other agencies to reduce the use of coal in power generation.

Industry

- CARB is considering approaches that would reduce emissions during cement production process, and reduce the amount of unused concrete delivered to job sites.
- CARB is evaluating measures that include capturing methane emissions during crude oil extraction. reducing methane leaks during transmission, improving the efficiency of refineries, and capturing methane at refineries.
- CARB is also considering measures that would increase efficiency in other industries that use industrial boilers or on-site internal combustion power sources, and for off-road equipment like forklifts and bulldozers.

De Minimis Threshold

- CARB is evaluating appropriate de minimis thresholds where emission reduction requirements will not apply. CARB is considering separate de minimis for combustion carbon dioxide and non-carbon dioxide gases due to the very small quantities used of many high-GWP gases.

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California's AB 32 Scoping Plan Appendices Issued

The California Air Resources Board (CARB) recently released the appendices to its draft Climate Change Scoping Plan. While CARB states that the appendices provide "estimated emission reductions and the associated estimated net cost of the measure, the lead agencies associated with each measure, and the timeframe for adoption and implementation of the measure," they do much more. These appendices add detail and texture to the Scoping Plan and reveal more of the thinking of how CARB intends to meet the requirements of the California Global Warming Solutions Act of 2006 (AB 32). The appendices clearly indicate the establishment of what the military might call "command and control" requirements through state and local regulations, the collection of numerous fees and assessments which are not only meant to supply revenue to the government to carry out the functions required by AB 32 but to also force change of the public's usage of vehicles, homes and products that currently may be classified as larger sources (individually or in total) of GHG emissions.

Highlighted in the appendices are a more robust description of the planned cap-and-trade system which will be implemented not only on the state level but along with the Western Climate Initiative plan for such a system. Also, detailed in the appendices are many of requirements that will be placed on local and regional government to change land use patterns, zoning and transportation so as to reduce vehicle miles traveled both in new development and in currently existing development.

Most importantly, the appendices discuss the establishment of a Public Goods Charge for water usage to fund investments in water efficiency that will lead to reductions in greenhouse gases; a Feebate Program that would combine a rebate program for low emitting vehicles with a fee program for high emitting vehicles; and a Carbon Fee intended by CARB to achieve emission reductions through changes in economic activity and individual behavior. CARB also will be requiring agriculture to alter many traditional practices which will likely impact the cost of food.

At this time both the Scoping Plan and the appendices are available for comment on CARB's website. For a summary of the key features described in the appendices, visit http://www.bhfs.com/NewsEvents/Publications.

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Summary of Key Features Contained in the Appendices to CARB's Draft Scoping Plan Prepared Pursuant to AB 32

The California Air Resources Board (CARB) recently released the appendices to its draft Climate Change Scoping Plan. Following is a summary of some of the key features included in the appendices.

Key Features:

- Cap and Trade
- Transportation/Land Use
- Electricity and Natural Gas
- Water
- Green Buildings
- Industry
- General Combustion
- Agriculture
- Carbon Fee

1. Cap and Trade

CARB indicated in their Scoping Report that there would be a link between California's Cap and Trade Program and that of the Western Climate Initiative[1] (WCI). The WCI released a draft Cap and Trade Program in May 2008. This program was consistent with the recommendations provided in June 2007 by the California Market Advisory Committee, and with the recommendations provided to CARB by the California Public Utilities Commission and the California Energy Commission in March 2008. However, because of the AB 32 mandate, the CARB plan will be drafted to include the WCI plan but will not rely on or default to the WCI plan's operation. CARB would develop regulations to implement the cap-and-trade system by the end of 2010, based on the authority and requirements of AB 32, with the program beginning in 2012. As California links to the WCI partner programs to create a regional trading market, California's cap must be consistent with the regional WCI program and the total regional emissions reduction goal. There will be, like with other commodity trading programs, stiff penalties for failure to comply with the requisite regulations.

It is expected that the cap-and-trade program will yield additional opportunities for lower cost reductions in GHG. However, other considerations include the ability to monitor, report and verify emissions to a high degree of accuracy; the incorporation of adequate environmental safeguards to prevent harm in communities that already experience disproportionate impacts that affect their health and air quality; the potential for economic impacts on industry or consumers; and the effectiveness of the cap in providing incentives for emission reductions in different sectors.

The cap and trade program will, however, be structured to initially appeal to the larger GHG emitters then the smaller ones by seeking to minimize the administrative burdens of the program for large emitters that account for the overwhelming majority of emissions while exempting small facilities from this burden, at least initially.

Of interest is the CARB position on offset locations. High quality offset projects located outside California can help lower compliance costs in California while

[1] WCI is a collaboration of states and Canadian provinces established to develop regional strategies to reduce GHG emissions. Launched in February 2007, the WCI currently consists of California, Arizona, New Mexico, Oregon, Washington, Utah and Montana, and the Canadian provinces of British Columbia, Manitoba and Quebec. In addition to these partner jurisdictions, six U.S. states, two Canadian provinces and six Mexican states are participating in WCI as observers.

reducing GHG emissions in areas that would otherwise lack the resources needed to do so. They look toward projects in the Mexican border region being particularly valuable. However, a limit on offsets, such as 10 percent of the compliance obligation for an individual firm will likely be set initially, no matter where the offset is, to "test the viability of the offset system while limiting the risk that unconstrained offsets could weaken the stringency of the overall cap-and-trade program."

2. Transportation/Land Use

GHG emission reductions will come from three overarching strategies: more efficient vehicles, lower-carbon fuels, and reduction of vehicle use or vehicle miles traveled (VMT). Most of the regulations will involve changes to vehicles, engines and fuels.

(a) Feebate Programs

CARB is considering a Feebate Program that would combine a rebate program for low emitting vehicles with a fee program for high emitting vehicles. The Feebate Program would have an immediate and cumulative effect on GHG emissions from new vehicles. Both GHG and criteria pollutant benefits would be expected as cleaner technologies enter the passenger vehicle and truck fleet. As the existing vehicle stock turns over and auto manufacturers respond to the Feebate Program by marketing cleaner and more efficient technologies, the GHG and criteria pollutant reductions would grow.

CARB believes this program would be self-financing with a small portion of the revenue generated from the program going to its administration. From year to year the program may generate a net loss due to a greater than expected demand for rebated vehicles or generate a net surplus due to a greater than expected demand for vehicles that carry a fee. Over the life of the program, CARB would adjust the fee and rebate schedules by modifying the GHG emissions benchmark to compensate the program for losses or surpluses generated.

(b) Land Use

The strategy with the most impact on business will relate to the issue of VMT. The overall goal is to employ land use patterns that are more diversified and allow for greater access to alternative forms of transportation and limit the movement of goods or otherwise position those goods closer to their ultimate destinations. CARB acknowledges that land use strategies that provide for more compact growth not only reduce VMT, but can also reduce the carbon footprint of developments by reducing land consumption, energy use, water use and waste. While these strategies are unlikely to provide significant reductions in GHG emissions by 2020 because of the time required to change land use patterns, they are a central element in ensuring that California gets on a low-carbon trajectory as we get to and beyond 2020.

(i) Local Government

CARB expects that local government will be the core of the land use strategies that will need to be employed to reduce VMT. These governmental entities are expected to show leadership by reduction in their own GHG emissions through a variety of ways. Included in these are directly influencing both the siting and design of new

residential and commercial developments in a way that reduces GHG associated with energy, water, waste and vehicle travel. CARB believes this can be done, in part, by updating general plans and zoning codes and to develop strategies to comprehensively reduce municipal and community GHG.[2]

CARB expects that local entities will effectuate the following types of programs:

- Congestion Pricing
- Pay-As-You-Drive Insurance Premiums
- Indirect Source Rules for New Development
- Programs to Reduce Vehicle Trips/Public Outreach and Education

(1) Congestion Pricing

CARB believes market research indicates the cost of driving can reduce emissions by making the transportation system more efficient and providing people with the choice of driving less to pay less or paying a little more to save time.

In a congestion pricing program, vehicles are charged a price, or toll, for traveling during peak hours on congested routes. Drivers who continue to travel on these routes during peak periods would pay more, but experience a faster, easier trip. Others would defer trips to off-peak hours, shift travel to less congested roadways, or switch to transit, carpools or vanpools. Greenhouse gas emission reductions would come directly from the relief of severely congested traffic, some reduction in vehicle travel, and from the investment of funds in transit infrastructure that would provide additional transportation options during congested hours.

Regional planning agencies have expressed the need to CARB that they desire to manage travel demand and raise funds for needed transit investment through congestion pricing strategies. However, regional planning authorities need legal authority from the State to implement these pricing measures.

(2) Pay-As-You-Drive Insurance

Pay-As-You-Drive (PAYD) insurance premiums are set based on driving record and other traditional risk factors, but are broken down into per-mile charges. Motorists would have the opportunity to lower their insurance costs by driving less. CARB believes that some would. So PAYD insurance offered to a large percentage of California drivers would have the potential to significantly reduce vehicle miles traveled and GHG emissions. The California Department of Insurance intends to adopt regulations with the goal of making PAYD insurance widely available in California and to encourage participation.

(3) Indirect Source Rules for New Development

Household transportation surveys and modeling reveal that low-density development far away from employment centers and other destinations has a very

[2] CARB recognizes the need to update CEQA to deal with a host of issues that impact on GHG emissions. They note that the Office of Planning and Research and the Resources Agency are developing proposed amendments to the CEQA Guidelines to provide guidance on how to address GHG in CEQA documents. As required by Senate Bill 97 (Chapter 185, statutes of 2007) the amended CEQA Guidelines will be adopted by January 1, 2010.

high transportation carbon footprint. To help regions meet their GHG targets, regulatory mechanisms to mitigate for these types of high-GHG developments might need to be implemented.

(4) Programs to Reduce Vehicle Trips Public Outreach and Education

This plan centers on public education of how to and the need to reduce vehicle trips on a daily or weekly basis. It will also include the development of a primary school climate change curriculum that includes transportation conservation to help raise a generation with a smaller carbon footprint.

3. Electricity and Natural Gas

To forestall global warming, energy needs must be fed by zero- or low-carbon energy sources as well as reducing energy consumption. California has actually been a leader in reducing usage over the last decade on its own, in part likely due to its own energy crisis over that time. Obviously, as pointed out in the Appendix, further reductions can be made by adherence to green building policies not only for new structures, but for retrofitting of older structures to meet yet to be set performance criteria.

Urged as a matter of public education (but the leap to penalty/tax issues is not far fetched) is the suggestion for energy-use feedback provided to consumers via in-home displays. This would allow the measuring of usage and the measuring of savings of energy, as well as the reduction in GHG emissions.[3] Another means of savings would be through the enhanced use of solar water heating. Also, CARB believes GHG emissions can be cut via the use of solar panels for electric production.[4]

It is expected that the energy producers will employ smart grids to lessen energy losses, and carbon capture (sequestration) to avoid GHG emissions.[5] There are also numerous strategies being considered to produce energy with lower GHG emissions including the increased use of natural gas, coal emission reduction and wind power.[6]

4. Water

Water transportation will have to lower its energy profile. This is a function of power usage and will be partially addressed by the changes in energy sourcing. However, more efficient transportation of water will need to be considered while at the same

[3] CARB states that energy use monitors have three basic components: a sensor that collects energy use data from the meter or circuit panel, a wall or desk-mounted display, and a means of communication between the two. After collecting demand data from the meter, the devices can display both instantaneous power usage and cumulative energy usage over selected time periods; in some cases, the device can also provide projected energy use and cost estimates and even show other home diagnostic data such as temperature, humidity and estimated greenhouse gas emissions.

[4] CARB discusses Governor Arnold Schwarzenegger's Million Solar Roofs Program. California has set a goal to install 3,000 megawatts of new solar capacity by 2017 which provides up to $3.3 billion in financial incentives that decline over time.

[5] Not recognized in the Appendix is the EPA's work which indicates that CO2 that is sequestered would be considered a hazardous substance and could trigger CERCLA liability, nor does it recognize recent studies indicating that such sequestration could effect groundwater quality.

[6] Neither hydro-electric nor nuclear power are referenced.

time addressing the issue of additional supply reliability to meet the growing demands.

Six GHG emission reduction strategies proposed are:

- Water Use Efficiency
- Water Recycling
- Water System Energy Efficiency
- Reuse Urban Runoff
- Increase Renewable Energy Production
- Public Goods Charge for Water

The first and second measures are primarily water supply measures. While efficiency and recycling have many benefits to the sector, the greenhouse gas emission reductions from these measures are accounted for in reduced energy requirements. Reusing urban runoff has the potential to achieve energy and emission reductions by reducing the need for new water supply. The purpose of the fifth measure, Increase Renewable Energy Production, is to take advantage of the State's water system-related opportunities to generate additional renewable electricity. Examples of renewable energy existing within water systems include in-conduit hydroelectric, solar, wind and gases emitted from decomposing organic wastes.

The highest profile strategy is the establishment of a Public Goods Charge for Water to fund investments in water efficiency that will lead to reductions in greenhouse gases. This is a public goods charge (need tax) on water that can be collected on water bills and then used to fund end-use water efficiency improvements, system-wide efficiency projects and water recycling. Depending on how the fee schedule is developed, a public goods charge could generate $100 million to $500 million annually to invest in further efficiency improvements.

5. Green Buildings

CARB outlines many possible requirements for green buildings as a stand alone strategy. Obviously, the implementation of their use will be voluntary as a selling tool, or required, most likely, under local law through various building codes. They have extended some of their approaches to include:

- Leadership in Energy and Environmental Design (LEED) – a nationally accepted green rating system that addresses new construction, existing commercial, residential and retail buildings, as well as schools and neighborhoods.
- The Collaborative for High Performance Schools (CHPS) – a rating system that offers green building certification geared towards California schools.
- GreenPoint Rated – a rating system that provides green building certification for California homes.

CARB looks at these strategies not as a cost, but as an *investment* that produces both monetary savings and other benefits over time. They also suggest that these green buildings further provide numerous health benefits, primarily through improved indoor air quality, thermal comfort and lighting environments.

Further, they assert that these strategies more than pay for themselves over the life of the building, meaning that green buildings essentially provide GHG reductions at no additional cost. This extensive reliance on green construction is to be extend to all state and state financed construction across California. This includes all public construction including schools.

This green building requirement will have to be adopted for residential construction through a Green Building Code. The California Building Standards Commission is currently conducting an annual building code adoption cycle that includes a new California Green Building Standards Code (CGBSC). Initially, the CGBSC will be voluntary. However, it is anticipated that the CGBSC will be adopted as a mandatory code by the end of 2010, which would be published in Title 24, Part 11 of the California Code of Regulations.

CARB suggests that this can be measured through a comprehensive environmental performance rating system. The purpose of such a system is to inform owners and prospective buyers how well a building "performs" in terms of energy and water efficiency, as well as its overall carbon footprint.

6. Industry

In summary, the emission reduction strategies for industry at large are quite diverse, but focus on increasing energy efficiency, using more recycled material, reducing leaks, decreasing the carbon intensity of products, switching to alternative methods and optimizing processes, and capturing and destroying process emissions of GHGs. Reductions in GHGs from industrial processes will look toward alternative fuels, increased energy efficiency, process improvements and technological advancements. However, the Appendix only centers on large industrial facilities. It is anticipated that industry would take advantage of the cap and trade system as an encouragement.

Whether or not the facility is taking part in the cap and trade program, each facility would be required to conduct an audit of the energy efficiency of significant individual sources within the facility to determine the potential to reduce greenhouse gases, criteria air pollutants, and toxic air pollutants. The audit would include an assessment of the impacts of replacing or upgrading older, less efficient units such as boilers and heaters, or replacing the units with combined heat and power units. The analysis would identify the potential emissions reductions, the costs, the cost-effectiveness, the technical feasibility and the potential to reduce air pollution impacts on local populations. Various rules will be established in 2010 and be in effect by 2012 that will put some structure to these measurements and requirements. It is clear that the use of the results of the audit will be used to determine if certain emission sources within a facility are subject to cost effective GHG reduction options.

7. General Combustion

In a section of the Appendix, CARB addresses an issue that it states should not "significantly affect" small business as CARB seeks to reduce GHG emission sources that are primarily boilers and internal combustion engines (IC engines). These GHG reduction measures would be for boilers and IC engines rated at or over 10 MMBtu per hour and 50 horsepower, respectively and this equipment is not typically owned by small business.

While boilers may not be an issue for small businesses, but many small business do have, as part of their facilities, stationary IC engines of 50 horsepower or more other than those used for emergency, which would be exempt. These engines are to be replaced by electric motors.

8. Agriculture

Initially, the suggestions for agricultures mitigation of GHG emissions include a recommended measure for methane capture at large dairies though use of manure digester systems. In the near-term, implementation of digesters would be voluntary. This voluntary approach in the initial years would encourage investment in the technology and improve cost effectiveness over time. The voluntary approach will be re-assessed at the five-year Scoping Plan update to determine if the program should be made mandatory by 2020. This reassessment will include performance, cost-effectiveness, other actions needed to facilitate implementation and other factors.

Additional efficiency measures such as water efficiency, improved irrigation pump efficiency, and optimal tire inflation (for fuel savings) are potential strategies for reducing GHG emissions. Further, agriculture has the ability to use biomass for electricity generation and fuel production

It is suggested that large dairies capture methane from manure through the use of an anaerobic digester. The captured methane can be burned to run a turbine and create electricity, or cleaned to create natural gas. CARB admits there are both technical problems and a lack of financial incentives to do more than list this as a voluntary action for the foreseeable future.

Emission reductions from fertilizer use are among the potential future strategies for the agricultural sector, but CARB admits the reduction potential is not quantified at this time. The application of nitrogen fertilizers leads to nitrous oxide (N2O) emissions.

9. Carbon Fee

A carbon fee is proposed, and intended by CARB to achieve emission reductions through changes in economic activity and individual behavior. It is not related to CARB's development of an administrative fee regulation to cover the costs incurred by state agencies for implementation of AB 32, or to smaller directed fees such as the recommended public goods charge on water.

CARB asserts that they can control GHGs by making carbon-intensive products relatively more expensive compared to lower-carbon products. Carbon fees are designed to drive consumption and investment toward more efficient and less GHG-intensive products. In order to be effective, a carbon fee program would need to include strong monitoring, reporting and enforcement of rules, including strict penalties for non-compliance. Carbon fees would be set to increase over time. CARB believes that the fees would be set high enough to drive investment and fuel use choices toward more efficient and lower carbon options. The fee level and rate of increase would be guided by some economic modeling that considers the availability, phase-in, and cost of achievable technologies, and be guided by a price structure that would stimulate changes to lower carbon activities.

CARB is currently evaluating two possible design scenarios that could be used for a carbon fee program. Under a "downstream" approach, fees would be imposed on facilities that fall within CARB's mandatory reporting jurisdictional authority. This would include facilities like power plants, electricity retail providers and marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and other industrial sources that emit more than 25,000 tons per year of CO2. Under an "upstream" approach, fees would be levied at or closer to the point that natural gas, gasoline, diesel fuel, and electricity imports enter the California economy. This option would achieve broader coverage of emissions sources, potentially covering over 90 percent of GHG emissions in the state if expanded to include industrial process and high global warming potential emissions. It would also be possible to implement a fee that reflected a hybrid of the two primary approaches.

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The Emerging Role of Climate Change in California Land Use Regulation

Presented by
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APWA
March 6, 2009

Always There

Brownstein Hyatt
Farber Schreck

Background Facts regarding California

- 6th largest economy in world
- Population is currently 37 million ~46 million by 2030 and 60 million by 2050
- State Legislature is beyond dysfunctional
- State/Local agency finances are precarious
- Local issues affected by statewide lobbying
- Growth/No-Growth battles are unending, and conflicts are dynamic and deeply rooted

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Overview of California Land Use Law: Foundational Principles

- Police Power Vested in Local Agencies
  - Plenary power ,not a grant from State
  - Broad Reach of Police Power
  - Courts defer to exercise of Police Power
  - Actions implementing General Plan are classic PP exercise

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Overview of California Land Use Law: Foundational Principles

- State Preemption
  - Requires complete occupation of field by State
  - Federal Preemption can apply
  - Complex and politically-charged issue, especially regarding land use regulation

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Principles of California Land Use Law: General Plan

- Constitution for all development
- Contains 7 mandatory elements:
  - Land Use
  - Circulation
  - Housing
  - Conservation
  - Open Space
  - Noise
  - Safety

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General Plan

All development must be consistent with General Plan

- With exception of Housing Element, local agencies have broad discretion regarding contents of General Plan

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Principles of California Land Use Law: Regional Planning

- Councils of Governments (consortium of local agencies). Role:
  - Provision of Information: Growth Forecasts
  - Regional Housing Needs Assessment (RHNA)
    - Distribution of housing allocations to local governments
  - Transportation Planning

  - Regional Transportation Plan: Federal req'mnt
  - Based on "most recent planning assumptions"
  - Annual assessment of regional transportation needs
- Distribution of Federal, State and Local transportation monies
  - Feds can withhold transport. funding if growth patterns not realistic

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Principles of California Land Use Law: Environmental Review California Environmental Quality Act (CEQA)

- Local agencies must consider environmental implications prior to making land use decisions
  - Agency must consider direct and indirect impacts of proposed project or action – including cumulative and growth-inducing effects
  - Purpose is to provide both decision-makers and the public with information as to potential environmental impacts of decision

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California Environmental Quality Act (CEQA)

- CEQA is like NEPA, only different
  - CEQA is much more substantive
  - A claim of CEQA violation is the easiest legal route to challenge a land use project approval

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Opportunities for Litigation to Challenge Land Use Decisions (Partial List)

- Failure to Comply with CEQA
- Inconsistency with General Plan
- Inconsistency with Zoning Ordinance or other Regulations
- Inconsistency with State Planning & Zoning Law
- Failure to Meet Due Process Standards
- Inadequacy of Findings
- Insufficiency of Evidence

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Summary of California Climate Change Initiatives: Assembly Bill 32 (Health & Safety Code section 38500 et seq.) (2006)

- Regulations govern all sectors of economy, including construction, transportation, oil and gas, power generation, industrial processes, and agriculture
- C.A.R.B. (granted broad power over AQ) will develop Scoping Plan
- "Local Government Actions and Regional Targets" mentioned in Draft Scoping Plan

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Actions of California Attorney General's Office

- Litigation against San Bernardino County's General Plan
- Comment Letters on EIRs for Major Projects
- Publication of Guidance Documents for General Plans, CEQA review of GHG Impacts
- Road Show Presentations
- Message: Climate Change must be Considered in Decisions

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Evaluation of GHG Impacts in Environmental Review of California Land Use Projects

- No formal amendment to State CEQA Guidelines will be made until January 1, 2010
- Environmental advocates' position: "one gram of CO2 is too much"
- Limited guidance from State
- Dilemmas for local agencies

- Result for agency: Do best you can and hope you don't get sued

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The Evolving Land Use/Climate Change Intersection: Senate Bill 375 -- Overview

- Technological fixes under AB 32 can't reach GHG reduction goals
- Requires reduction of VMTs
- SB 375 is product of 2 years of intensive negotiations conducted by environmental organizations, building industry, and local government: "Coalition of the Impossible"

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SB 375 Overview

- Basic premise is that air quality, traffic and carbon generation know no political boundaries
- Extension of historic debate on role of regional vs local planning
- SB 375 is "program" under AB 32 for auto/light truck emissions
- Stated approach is to provide incentives (carrots) rather than top-down regulation (sticks) to "encourage" regional planning

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SB 375 Overview

- SB 375 consists of 3 critical areas:
  - GHG Planning Process
  - CEQA Processing Benefits
  - Adjustment of Housing Policies

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SB 375 Overview: GHG Planning Process

- Associations of Governments ("Metropolitan Planning Organizations" (MPO)) become regional GHG planning bodies
- By 9/30/10, CARB develops GHG emission reduction target for each MPO
- Each MPO develops land use forecast within its Regional Transportation Plan "the "Sustainable Communities Strategy" (SCS).
  - Local general plans must be "considered"
  - SCS must "gather and consider" info re farmland, bio areas, etc.
  - SCS must identify areas sufficient to house regional needs
  - MPO must determine if SCS will feasibly achieve GHG reduction goal
  - SCS must quantify GHG reduction and show shortfall if any

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SB 375 Overview: GHG Planning Process

- If SCS does not reach the GHG reduction target set by CARB, MPO must submit an "Alternative Planning Strategy" (APS(to reach goal.
  - APS not part of RTP, and does not affect transport. funding
  - No connection to local general plans
  - APS cannot be CEQA factor to determine if project creates impact
- Workshops/Hearings held at ALL levels of plan development
- CARB must certify SCS or APS within 60 days of submittal
- Development of SCS/APS is a project subject to CEQA

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SB 375 Overview: GHG Planning Process

- Under SB 375, funding to local agencies for regional transportation monies distributed by State is only allocated to projects that are consistent with SCS/APS
  - MPO's first SCS will reflect current agencies' general plans
  - MPOs are composed entirely of local officials
- Local agencies are not required to amend their general plans to conform to APS – but developers will seek amendments

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SB 375 Overview: CEQA Streamlining Benefits

- Residential/Mixed Use Projects
  - Residential MU projects that are consistent with SCS/APS get some CEQA streamlining benefits

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SB 375 Overview: CEQA Streamlining Benefits

- "Transit Priority Projects,"
  - Transit Priority Projects, as defined, gain a CEQA exemption or streamlined CEQA analysis. Definition of TPP:
    - 50% residential
    - Density of at least 20 du/acre
    - Within ½ mile of transit corridor with minimum 15 min. peak hour service

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SB 375 Overview: CEQA Streamlining Benefits

- CEQA Statutory Exemption provided for Certain TPPs
  - Criteria for Exemption (Partial List):
    - NTE 8 acres or 200 residential units
    - Served by existing utilities
    - No sig. effect on historic resources
    - Bldgs. Designed to have 15% energy efficiency and 25% less water use
    - Project provides either 5 acres/1000 open space or affordable housing benefits (20% mod, 10% low, 5% very low, or equivalent in-lieu fees)

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SB 375 Overview: CEQA Streamlining Benefits

- For all other TPPs, "Sustainable Communities Environmental Assessment" can be prepared
- SCEA provides significant CEQA processing benefits

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SB 375 Overview: CEQA Streamlining Benefits

- In addition, local agency may develop standard set of traffic mitigation measures for Transit Priority Projects
- Once adopted, the project need not comply with any other traffic mitigation measures

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SB 375 Overview: Housing Policy Adjustments

- Historically, approval of major housing projects is often a source of conflict in California
- Under SB 375, RHNA Allocations by Metropolitan Planning Organizations and SCS/APS must be mutually consistent
- MPO must align Regional Housing Needs Assessment, Regional Transportation Plan, and SCS/APS planning cycles to a single 8-year planning period
  - "Result: "Fair Share" housing allocation under RHNA becomes tied to the development pattern contained in SCS/APS

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SB 375 Overview: Housing Policy Adjustments

- Miscellaneous changes made to General Plan Housing Element law
  - Timetable established for local agency to adopt HE and submit to State Department of Housing and Community Development.
  - Defaulting local agencies lose SB 375's consolidated 8-year review cycle and are held to a 4-year review cycle with HCD
  - Longer timetable is established for local agencies to bring zoning into conformity with Housing Element

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SB 375 Overview: Housing Policy Adjustments

- Miscellaneous changes made to General Plan Housing Element law
  - Sanctions (court orders) may be imposed for failure to comply with timelines
  - Anti-NIMBY re-zone protections for projects >49% affordable that require zoning change

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Conclusion: Near-Term Issues

- Despite hype, SB 375 provides no easy fixes: it is largely procedural
- Kumbaya, this ain't
- Growth battles will be played out in SB 375 implementation
- No sector is completely happy with SB 375
- Litigation/CEQA will play crucial role

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Conclusion: Long-Term

- Kumbaya will never happen
- Carrots, not Sticks – For now
- What will be impact of dysfunctional Legislature/state budget crisis?
- Is true top-down regulation in the offing? Impact on local police power?
- Will Climate Change become a genuine policy consolidator?

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Carolynne C. White

Colorado Local Government Regulation of Land Use for Climate Change

by Carolynne C. White and Kevin Holst

Colorado's approach to land use regulation for climate change will occur mostly at the local level, and like other land use regulation, will be custom tailored by each local government to address its unique needs. Despite the absence of uniformity or state-level regulation, some trends are beginning to emerge in this area.

There is no escaping it—the world is "greening." Products advertised on television and in magazines now are "green"; car manufacturers tout hybrid cars and higher gas mileage; and politicians debate strategies to address global warming. The question for the practitioner, however, is: What is global warming and why should attorneys involved with land use and development be informed about trends in this area?

As used in this article, the term "global warming" refers to the phenomenon of average global temperatures rising more quickly now than they have in the past, which many scientists believe has been caused, or at least accelerated, by human activity increasing the amount of carbon dioxide (one of several greenhouse gases) in the atmosphere. Scientists have predicted results ranging from drought, decreased vegetative cover, loss of ecosystems and species, and loss of snowpack, to increased precipitation, rise in sea level, and flooding.[1]

For purposes of analyzing the impact of global warming on land use and development, it is irrelevant and this article does not address whether various scientific theories of global warming are accurate, or whether global warming is caused or accelerated by human activity. Due to the emergence of global warming into the general public consciousness, governmental entities at all levels are under tremendous political pressure to do something about global warming, which frequently means regulatory action.

This article summarizes the actions already taken or under consideration by local governments in Colorado. It also discusses the likely future direction of land use regulation for global warming in Colorado, as well as the effects on development.

Statewide or Local Regulations

Outside Colorado, efforts to address climate change through land use and development regulations have largely been state-driven. For example, the California Legislature passed the Global Solutions Act of 2006, which, among other things, requires local governments to consider the impacts on global warming prior to approving a new development.[2] Implementation of the Global Solutions Act of 2006 includes a state-level panel promulgating rules regarding how local governments are to implement its provisions.

In contrast, Colorado has a long tradition of local control of land use. The legislative scheme governing land use in Colorado vests authority in cities and counties to regulate and decide traditional land use matters, such as comprehensive planning, zoning, subdivision, and design guidelines.[3] Several Colorado Supreme Court cases have upheld this tradition and statutory scheme,[4] and legislative efforts to preempt this local authority have been largely unsuccessful.

Because buildings account for a significant percentage of the greenhouse gas emissions that cause global warming, and because the regulation of the built environment in Colorado is largely within the purview of local governments, much local government effort has focused on the built environment. According to the American Institute of Architects, 48 percent[5] of these emissions are from buildings; the U.S. Green Building Council estimates buildings contribute approximately 39 percent.[6]

To some degree, federal efforts to address global warming also have recognized the role of local governments. The recently enact-

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Government and Administrative Law articles provide information to attorneys dealing with state and federal administrative agencies, as well as attorneys representing public or private clients in the areas of municipal, county, and school or special district law.

ed Energy Efficiency Block Grant Program (EEBG)[7] follows the model of Community Development Block Grants (CDBG), by allocating federal funds directly to cities and counties for various programs designed to reduce carbon emissions. However, local governments in Colorado are not waiting for state and federal direction.

Colorado Efforts to Regulate Sustainability

Colorado's efforts to regulate sustainability can be traced to the electorate's rejection of the Olympics in 1976 for environmental reasons. More recent, the debate around "smart growth" and new urbanism in Colorado grabbed headlines from 1999 to 2001. During this time, Colorado voters defeated Amendment 24, which would have codified local government planning documents by putting them to a popular vote, and the General Assembly considered and rejected more than sixty bills related to "smart growth." In the second of two special sessions in 2001, the General Assembly passed four growth-related bills, all of which were compromises among the various stakeholder groups, and none of which radically changed how growth and development occur in Colorado.[8]

Unlike the debate around smart growth, however, the global warming discussion has a broader audience. The issue of global warming has crept into the broader consumer consciousness, from coffee cups to cars, and has begun to affect consumer behavior and governmental policy on an extensive scale.

A relationship exists between smart growth and land use regulations to address global warming, even though different buzzwords are used to describe both. Smart growth was about reducing vehicle miles traveled (VMT) and consumption of raw land by promoting compact and walkable development. A related field involves advancing human health by requiring or promoting development that makes it easier for people to walk or bicycle to work, recreation, and errands. Although reduction of global greenhouse gas emissions was not the primary goal of smart growth efforts, it was a corollary benefit. Now, the focus has shifted to reducing greenhouse gas emissions for its own sake.

Thus, in one sense, the general trend in land use and zoning codes for the last ten to twenty years has been toward reducing greenhouse gas emissions, although that has become a primary goal only in the last few years. This article focuses primarily on those measures cities and counties are taking that are specifically aimed at addressing global warming by reducing greenhouse gas emissions from the built environment.

Attempts to address global warming range from changing governmental behavior on the one hand to regulating private sector behavior on the other. Within that broad spectrum, regulation aimed at the private sector progresses from education and incentives, to removing regulatory barriers, to mandates or outright requirements.

Changing Governmental Behavior

At the end of the spectrum regarding governmental behavior, seven Colorado cities, one county, and the state of Colorado have adopted "Climate Action Plans."[9] The majority of these plans focus on goals and actions the governmental entity intends to take to reduce its own greenhouse gas emissions, such as increasing fuel efficiency and reducing emissions of its fleets; reducing energy consumption of public buildings; changing lighting and signage to more efficient fixtures, such as compact florescent lamps (CFLs) and light-emitting diodes (LEDs); increasing utility efficiency, either as a consumer or a provider, if the city has its own utility; reducing waste and recycling; and managing traffic flow.

This type of local government effort is the most common and the easiest to achieve. Many cities have converted fleets to more fuel efficient vehicles, reduced energy consumption in municipal buildings, increased recycling efforts, and reduced emissions from landfills. For example, the Town of Basalt has attempted to green its government by improving its energy efficiency and conducting energy audits of its municipal buildings.[10] The City of Aspen's "Canary Initiative" seeks to improve the city's use of renewable resources to meet its electricity needs.[11]

Under its Climate Action Plan, the City of Boulder seeks to steadily increase the amount of renewable fuels used by city vehicles. Boulder already has more than 115 alternative fuel vehicles, including more than "[nine] Toyota Prius and [sixty-six] vehicles running on biodiesel."[12] In addition to purchasing more alternative fuel vehicles and hybrids, Boulder's fleet-specific strategies include reducing VMT, fleet vehicle emissions, and use of petroleum-based fuels.[13] The City and County of Denver consistently ranks among the top ten greenest fleets in the country, with a hybrid motor pool for city employees, widespread use of biodiesel, and the recent purchase of pedicabs for parks and recreation employees.[14]

In addition, sixteen Colorado cities[15] have signed the U.S. Conference of Mayors Climate Protection Agreement (Agreement), which seeks to advance the goals of the Kyoto Protocol.[16] Under the Agreement, participating cities commit to taking the following three actions:

1) 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;
2) 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
3) urge the U.S. Congress to pass the bipartisan greenhouse gas reduction legislation, which would establish a national emission trading system.[17]

Another national effort to coordinate local governments is the Cities for Climate Protection Campaign, sponsored by International Council for Local Environmental Initiatives (ICLEI) Local Governments for Sustainability.[18] This campaign promotes five milestones to reduce greenhouse gas and air pollution emissions throughout the community:

1) conduct a greenhouse gas emissions inventory and forecast to determine the source and quantity of greenhouse gas emissions in the jurisdiction;
2) establish a greenhouse gas emissions reduction target;
3) develop an action plan with both existing and future actions, which, when implemented, will meet the local greenhouse gas reduction target;
4) implement the action plan; and
5) monitor to review progress.[19]

Thirteen Colorado cities and two counties have joined this program,[20] which offers technical assistance for local governments in

implementing the five milestones. Boulder, Denver, and Fort Collins are among the few Colorado local governments that have completed a greenhouse gas inventory.

Changing Private Sector Behavior

Toward the other end of the spectrum, cities seeking to affect private sector behavior have adopted programs progressing from education, to elimination of barriers, to providing incentives (including public financing). Programs at the mandatory end of the spectrum, including revisions of building and zoning codes, mandates, and taxes are discussed below under the heading "Programs, Regulations, Codes, and Mandates."

Education

Few education programs focus directly on land use and the built environment; most focus on more easily addressed behaviors, such as recycling and energy consumption. For example, in 2005, the City of Boulder partnered with Western Resource Advocates and renewable energy suppliers[21] to challenge the community to increase wind power purchases by adding 500 wind power customers.[22] In 2006, the Town of Telluride sought to educate its community through its "Telluride Unplugged" Initiative, a six-week campaign to educate and engage the public on how to reduce carbon emissions.[23] The City of Fort Collins has established wide-ranging educational programs for residents and businesses as part of its "Climate Wise" program.[24]

In 2008, the City and County of Denver launched an education campaign called the "Take 5 Pledge," urging citizens to pledge to change five easy habits for a more sustainable Denver and explaining the individual and collective impacts of these actions. Citizens who completed the pledge received a "Green Your Home" toolkit to help them take further steps toward energy efficiency and water conservation.[25]

Fort Collins also has implemented what may be the only education initiative geared specifically toward building, called the "Builder's Guide to Energy Efficient Home Construction."[26] The Guide provides illustrations of specific techniques to meet code requirements, as well as recommended practice for those who wish to exceed code minimums, and provides builders with a list of references and resources on energy efficient technologies and techniques.

On a more regional level, in 2008, Denver began a regional training for building code officials on ways to provide incentives for builders to go beyond the 2006 International Energy Conservation Code (discussed below).[27]

Incentives, Eliminating Barriers, and Public Financing

The State of Colorado has attempted to mitigate cost barriers to solar energy with the adoption of S.B. 08-117,[28] which prohibits municipalities and counties from charging a fee to install an active solar energy device or system in excess of the lesser of: (1) the municipality's or county's actual costs to issue the permit; or (2) $500 for a residential application or $1,000 for a commercial applica-

tion.[29] Environmental groups have criticized the efficacy of this measure, because many cities already had permit fees much lower than these thresholds, and some have eliminated permit fees entirely.[30] For example, in Boulder, permit fees for photovoltaic (PV) system installations are $69.60 for residential permits and $139.20 for nonresidential permits.[31] The City and County of Denver also caps solar installation permit fees at $69.[32] Effective May 1, 2008, the City of Littleton waived "city building permit fees for the installation of solar hot water and photovoltaic systems for existing residential structures."[33]

Examples of public financing incentives exist throughout the state. For example, to encourage individual consumers to invest in capital-intensive renewable energy improvements, the City of Aspen has partnered with the nonprofit Community Office for Resource Efficiency (CORE) to offer incentives to promote renewable energy, including zero-interest loan financing and grid-tied PV power buyback.[34] CORE is the nation's first local "solar production incentive program," which pays local residents $2 per watt for installing a solar PV system, up to $6,000, in addition to any state or utility rebates available.[35]

The Golden Urban Renewal Authority (GURA) has adopted a resolution requiring that private development projects seeking public support through tax increment financing must be sustainable according to the nationally recognized Leadership in Energy and Environmental Design (LEED®) Green Building Rating System, discussed in more detail below.[36]

The Colorado Housing and Finance Authority (CHFA) and seven metro Denver cities have collaborated on a novel initiative to provide affordable housing near transit stations, called "location-efficient mortgages." The initiative provides special financing benefits for qualified projects to promote low- and moderate-income rental housing near Regional Transportation District (RTD) transit stations along the 150-mile rail network known as "FasTracks" in the Denver metro area.[37] The development must create more than fifty units of affordable housing and be within 1,500 feet of a planned or existing transit station to be eligible for the assistance. This is one of the few initiatives specifically targeted at reducing VMT, a significant source of greenhouse gas emissions.

Programs, Regulations, Codes, and Mandates

Many cities have set climate change-related goals for reviewing and amending existing zoning, subdivision, or other land use codes. However, few have implemented such changes. The following discussion provides an overview of regulations, codes, and mandates from Colorado, as well as several green-building programs.

Fort Collins Climate Task Force

In June 2008, the City of Fort Collins Climate Task Force released specific recommendations to achieve the city's new goal of reducing community-wide greenhouse gas emissions 20 percent below 2005 levels by 2020, increased from its prior goal of 30 percent below predicted 2010 levels by 2010.[38] A Climate Task Force proposed short- and long-term solutions to achieve this goal.[39] The long-term strategies proposed by the Climate Task Force center on transportation, land use, green building, energy, urban forestry, and community engagement.[40]

Specifically with respect to land use regulation, the Climate Task Force recommended that the city:

1) implement land use code changes that support reduction of greenhouse gas emissions;
2) promote and pursue infill/refill development;
3) incorporate LEED certification for neighborhoods (LEED-ND) into the development code;
4) reduce development fees based on a green rating system;
5) promote transit-oriented development; and
6) require all developments to reduce travel demand below that of comparable existing developments.[41]

Required changes to the city's Land Use Code would include integrating historic preservation with green building efforts, requiring a minimum level of green building standards for any development projects that receive subsidies from the city, implementing incentives for green building as part of the development review process, implementing "green roofs," and creating a revolving zero-interest loan fund to assist development of green projects.[42] However, none of these changes has been implemented.

Golden's Resolution 1793

In August 2007, the City of Golden adopted Resolution 1793 outlining the City's sustainability goals.[43] Unlike most city climate change plans, which set goals primarily for government action, Golden's goals implicate changes to the city's building code, subdivision code, and zoning code, although, as in Fort Collins, these changes have not been adopted. The Resolution contained the following goals:

1) ensure that within ten years, 90 percent of all new buildings constructed in Golden each year are built to green building standards;
2) reduce overall community energy usage in Golden by 20 percent and increase to 20 percent the production of its energy use derived from renewable energy sources within ten years;
3) reduce the city's solid waste stream contribution by 25 percent in ten years;
4) reduce the community's total vehicle miles traveled by 15 percent in ten years;
5) reduce *per capita* water use by 15 percent in five years; and
6) improve the health of the ecosystem associated with Golden waterways.[44]

International Energy Conservation Code

Perhaps the most common municipal regulation addressing climate change is the adoption of the 2006 International Energy Conservation Code (IECC), promulgated by the International Code Council (ICC), which holds hearings and adopts updated or revised codes every three years. Some states adopt such codes statewide and require that local governments use their standards in reviewing and approving building permits. Because Colorado is a home rule state, cities have the authority to decide which codes to adopt.[45] Despite this, in 2007, the General Assembly adopted H.B. 07-1146, which requires that any county or municipality that adopts a building code also adopt an energy code that is at least as stringent as the most recent version of the IECC. Three Colorado counties and twenty-nine municipalities have adopted the 2006 IECC, along with the state of Colorado (for state buildings only).[46]

The technical standards in the 2006 IECC represent significant increases in energy efficiency over the more common International Residential Code (IRC), which addresses all aspects of home building and contains a relatively small and less-stringent chapter regarding energy. The IECC is the code builders must follow to receive federal tax credits, and is referenced in the LEED criteria. Most cities adopt the entire IRC and then supplement with a separate energy efficiency code.

Currently, environmental groups are advocating a program dubbed "the 30% Solution," a campaign to urge the ICC to adopt a package of modifications for the 2009 version of the IECC that would require additional energy efficiency increases of 30 percent.[47] Critics of the program argue that the increased cost will exacerbate affordable housing programs and the uniform requirements will eliminate flexibility. At the September 2008 hearings in Minneapolis, the ICC failed to adopt the entire package of amendments, but did vote to incorporate several individual provisions into the 2009 version of the IECC.

Removing Barriers to Energy Efficiency and Renewable Energy

Other regulatory efforts include identifying and removing barriers to energy efficiency and renewable energy. For example, many sustainability and climate change experts argue that distributed power—that is, many small power sources, such as individual wind turbines and solar panels—are preferable to large scale power sources, because the energy has to travel a shorter distance between generation and consumption.[48] Obstacles to the widespread use of such small-scale power generation include capital costs, neighbor concerns regarding noise and visual impacts, and zoning and permitting requirements. Typically, zoning regulations allow structures taller than thirty-five feet in residential districts and lower density commercial districts only as a use by special review or permit.[49]

To avoid lengthy adoption timelines for local governments, the states of Wisconsin and Nevada relied on state preemption to more quickly promote successful distributed wind installations.[50] As previously noted, Colorado's legal structure favoring local control makes such state action unlikely, although the General Assembly has passed legislation prohibiting private residential covenants that disallow such structures.[51] Some Colorado cities have adopted solar access ordinances, which, for example, restrict shadows that development may cast onto adjacent lots.

In 2001, the City of Boulder passed an ordinance to secure solar energy access for homeowners and renters.[52] Under the ordinance, homeowners and renters are ensured access to sunlight, with limits on the amount of permitted shading by new construction and a requirement that the new buildings be sited to provide good solar access.[53] Nonresidential buildings have similar siting requirements for solar energy access.

Restricting Home Size

Another approach is restricting home size to reduce carbon emissions, known as the "carbon footprint." In 2006, Pitkin County revised its code to restrict the size of homes built in the county.

The provision restricts the size of homes in rural areas to 15,000 square feet and limits urban-area home size to 5,750 square feet.[54]

In June 2008, the Boulder Board of County Commissioners passed new regulations limiting house sizes as means to protect the rural character of unincorporated Boulder County, as well as to increase energy efficiency and reduce carbon emissions.[55] Under the new rules, effective August 8, 2008, applicants planning to build a dwelling larger than 6,000 square feet (including basements, garages, and storage areas) must purchase extra "development credits" from vacant lots or smaller dwellings.[56] In addition, as part of the site plan review process, the county now requires that a new development be "compatible" or in harmony with the surrounding neighborhood.[57]

LEED Certification

The most well-known comprehensive green building program in the U.S. is the LEED Green Building Rating System, a set of certifications promulgated by the U.S. Green Building Council.[58] This third-party certification program is a nationally accepted benchmark for "the design, construction and operation of high performance green building."[59] LEED certifications are offered for existing operations, new commercial construction and major renovation projects, existing building operations, commercial interiors projects, core and shell projects, homes, and neighborhood development.[60]

Several cities have adopted LEED certification goals or requirements for new municipal buildings, but few have adopted goals, incentive programs, or requirements for LEED certification for private construction. For example, as previously noted, the City of Fort Collins Climate Task Force has recommended the implementation of the LEED for LEED-ND Rating System.[61] This system is designed to "integrate the principles of smart growth, urbanism and green building into the first national system for neighborhood design."[62] In addition to containing standards and points for actual construction materials and practices, the LEED-ND criteria also address larger land use planning issues, such as locating residential development close to existing towns and city centers, providing good transit access, and encouraging infill development as a way to reduce VMT.[63]

The LEED-ND certification currently is in its pilot period, and several projects in Colorado have received or are seeking certification under the pilot program. Since the inception of the LEED certification program, Colorado consistently has been among the top ten states with the most LEED-certified projects,[64] despite the fact that no local government or other regulation requires this certification for private construction.

In 2008, the City and County of Denver began requiring that all new affordable housing meet the Enterprise Fund Green Communities standard, which is comparable to the LEED standard.[65]

Built Green Certification

Other certifications include Built Green Colorado, founded in 1995, which is part of one of the oldest and largest green home building programs in the nation, promulgated by the National Association of Homebuilders (NAHB).[66] Under the Built Green program, registered homes are required to satisfy specified criteria. These criteria, known as the "Built Green Checklist," include an energy efficiency requirement and a menu of options addressing a range of green items from which the builder must select a minimum number.[67] The program allows builders to use alternative methods to construct green to meet the criteria and receive the "Built Green" designation. As a means of verifying and enhancing the credibility of the program, 5 percent of all homes registered as Built Green are inspected on a random basis by certified raters of the independent, nonprofit agency, E-Star Colorado.[68]

Green Points Program

The first, and perhaps the most comprehensive, Colorado-based green building program is the City of Boulder's Green Points program, originally adopted in 1980 as the Energy Options Points Program. Although not originally adopted specifically to address climate change, the program has evolved to incorporate climate-related goals and current technologies. The program did not become a mandatory part of Boulder's municipal code until 1996, when all new development, both public and private, was required to obtain points using the Green Points system as a requirement for development approval.

On November 13, 2007, Boulder City Council adopted Ordinance 7565, which updated the Green Points program. Effective February 1, 2008, the program applies to residential single and multi-unit new construction, remodels, and additions or improvements to existing homes. A key element of the program is to mandate specific levels of energy efficiency for different types and sizes of residential projects. To measure energy efficiency compliance, Boulder requires a specific Home Energy Rating System (HERS) Index score from a Residential Energy Services Network (RESNET) accredited HERS rater.

Under the Green Building and Green Points program, an applicant must demonstrate compliance with all of the provisions of Green Points program prior to the issuance of a certificate of occupancy.[69] Compliance requires a specified number of points, depending on the type of project.[70]

Points can be achieved through site development, including: (1) installation of certain types of landscaping (for example, organic soil amendments and xeriscaping); (2) shading of hardscapes (for example, preservation of existing mature trees on-site and planting shade trees); (3) surface water management; and (4) high-efficiency automatic irrigation.[71] In addition, the Green Points program provides for a variety of options to allot points for areas such as building rehabilitation, waste management, energy efficiency, solar, water efficiency, material efficient framing and structure, use of sustainable products, indoor air quality, operations and maintenance binder, and design process and innovation.[72]

The Green Points program also contains mandatory green building requirements for additions and remodels. Under this component of the program,[73] an applicant must demonstrate energy efficiency compliance through HERS, using a rater accredited by RESNET, obtain an energy audit, install energy-efficient light bulbs, replace furnaces with direct vent units with improved efficiency ratings, recycle 50 percent of construction waste, and divert demolished materials from landfills.[74]

ECObuild Program

Eagle County adopted an efficient building code called "ECObuild," which applies to all new residential construction and additions of more than 50 percent of floor area.[75] The program specifies a list of energy efficient technologies and construction techniques, and requires a minimum number of points based on

the type of construction. Projects that exceed the required points may be eligible for a building permit fee rebate; projects that do not meet the required points threshold are required to pay a fee.[76] For example, between eight and twelve points are awarded for the installation of a solar hot water system. Houses smaller than 2,000 square feet are required to have a minimum of forty points and are eligible for a building permit fee rebate of 25 percent if sixty points are achieved.[77] Exterior uses of energy, such as a hot tub or snowmelt system, are assessed a fee, which may be waived if renewable energy is used to power such uses.[78]

Aspen and Pitkin County Efficient Building Program

Along the same lines, the City of Aspen and Pitkin County have jointly adopted an "Efficient Building Program (APEB)."[79] Effective June 2002, this was first adopted as a voluntary program, designed to educate the public and the building trades about the more efficient use of resources.[80] Some checklist items are required for all new residential construction; others are for only publicly financed affordable housing projects. New construction less than 1,500 square feet is required to obtain fifty points. Applicants can receive one point for each tree planted above the minimum required, up to a maximum of ten points for trees. One unique aspect of this program is that it is jointly adopted by the city and the county, and thus applies to all new residential construction within either the municipal boundaries of the City of Aspen or the unincorporated areas of Pitkin County.

Carbondale Efficient Building Program

Also in Pitkin County, the Town of Carbondale adopted a similar program in 2007, called the "Carbondale Efficient Building Program."[81] Unlike the APEB, the Carbondale Program is mandatory, and applies to all new residential construction, as well as residential sections of multi-use projects, and additions/reconstruction (remodel) projects.[82] The Carbondale Program does not specifically identify climate change as a goal of the program; instead, it defies general goals of energy efficiency and conservation of natural resources. New construction of 2,000 square feet or smaller must obtain 110 points, and houses larger than 3,000 square feet must supply some of their energy on-site.[83] This program also allows for a cash-in-lieu payment to substitute for action on certain categories of points.

Blueprint Denver and Plan 2000

On a larger scale, the City and County of Denver currently is revising its Zoning Code, which has not been comprehensively overhauled since 1956. The principal driving force behind the project is the adoption in 2002 of a supplement to Denver's Comprehensive Plan, called "Blueprint Denver." Blueprint Denver sought to integrate transportation and land use planning, and to direct the inevitable growth associated with a predicted 132,000 new residents by 2020 to those parts of the city best able to accommodate that growth, and protecting those areas of the city in which only minimal growth could be accommodated.[84]

Denver's Comprehensive Plan, Plan 2000, set forth the following guiding principle:

> The greatest current challenge to the environment is managing growth—slowing the loss of land, the consumption of resources, the congestion and the human stress created by urban sprawl. The public-policy challenge to develop and implement balanced and sustainable growth strategies addressing equity, stewardship and cooperation will become ever more critical.[85]

Blueprint Denver and Plan 2000 concluded that, under Denver's current zoning code, regulations were not sufficient to maximize the benefits and minimize the impacts of growth. In 2004, Mayor John Hickenlooper appointed a citizen task force to oversee the process of overhauling the city's zoning code. Although the entire effort is one in furtherance of sustainability, based on the principles of Blueprint Denver, the task force also has engaged a consultant to conduct a "sustainability review" of the zoning code, to identify barriers and propose incentives to a more sustainable built environment.

Although Blueprint Denver and the zoning code update are not *per se* directed at addressing global warming, the overall concepts

of sustainability, reducing VMT through increased density and better integration of transportation and land use planning, like smart growth, actually do address the issue. The Blueprint Denver document itself does not talk about climate change or global warming—these concepts were not part of the public consciousness when the document was adopted. However, the plan does seek to reduce environmental pollution through measures such as reduction of VMT, preservation of Denver's tree canopy, and directing growth to areas best able to accommodate it.

Lakewood Zoning Code

The City of Lakewood currently is embarking on a comprehensive review of its zoning code, which will include specific attention to a wide variety of sustainability goals, including community sustainability; environmental sustainability; energy efficiency; infill developments; housing choices; redevelopment of commercial, industrial, and employment areas; integrated land use and transportation systems; and transportation alternatives.[86]

Sustainable Community Development Code

Only a few cities, such as Denver and Lakewood, have undertaken wholesale revision of their codes, and those efforts are only partly directed at climate change. One tool for evaluating the degree to which a zoning code promotes sustainability and specifically addresses climate change is the Sustainable Community Development Code, developed by Clarion Associates, a national land use and real estate consulting firm.[87] The Sustainability Code serves as a model code, and provides for three achievement levels: Bronze (Good); Silver (Better); and Gold (Best).[88] In addition to providing references and code examples, each achievement level offers specific recommendations under the topical headings of "Remove Obstacles," "Create Incentives," and "Enact Standards."[89]

The Sustainability Code organizes recommendations under varying headings, including "Climate Change and Greenhouse Gas Reduction"; "Community Health and Safety"; "Food Production and Security"; "Housing Affordability"; "Housing Diversity and Accessibility"; "Natural Hazards/Wildfire"; "Renewable Energy"; and "Water Conservation."[90] These recommendations provide a resource for cities and counties evaluating existing codes, or considering other regulations to address climate change.

Fees and Taxes

Finally, some cities have adopted fees or charges, either in addition to or instead of green building regulatory changes. For example, the City of Aspen and Pitkin County jointly adopted a program called the Renewable Energy Mitigation Program (REMP) in 2000 as a means of improving energy efficiency and encouraging renewable energy. Under REMP, new homeowners are charged fees based on the size of their homes: a flat $5,000 if their homes exceed 5,000 square feet; $10,000 for more than 10,000 square feet; and up to $100,000 if the home exceeds the "energy budget" allotted to the property by the local building code.[91] The fees generated by REMP are used for local energy efficiency and renewable energy projects.

Perhaps the most directly targeted measure in Colorado is the Climate Action Plan Tax, approved by the voters of the City of Boulder on November 7, 2006.[92] Under the Plan, the City became the first municipal government in America to impose an energy tax on its residents to directly combat global warming.[93] The energy tax is also known as a "carbon tax," because most of Boulder's electricity originates from coal.[94] The tax dollars generated from the Plan are being used to fund the City's "Climate Action Plan," which is estimated to result in more than $63 million in energy cost savings over the long term.[95]

Conclusion

Local governments throughout Colorado have begun to incorporate measures to address global warming into their regulatory schemes. Some of this is being done directly—the City of Boulder's carbon tax is one example; some is occurring indirectly, with green building programs directed generally at broad sustainability goals. The number of cities and counties adopting such measures has reached the point where the trend is undeniable. Even in jurisdictions where regulations do not require green building or other climate change measures, political pressure to demonstrate commitment to sustainability is likely to affect development projects. Furthermore, in the absence of any such requirements, the housing and building market has begun to demand sustainability as a matter of course.

Land-use-related solutions to climate change in Colorado will be implemented largely at the local level, and each jurisdiction can tailor its regulatory scheme to its unique situation. As with all land use practice, it is prudent for private land use practitioners to be aware of the nature and extent of the specific requirements in each jurisdiction. For public sector lawyers in the land use arena, understanding what programs have been successful elsewhere can inform local decisions. Given the rapid pace of change in this area and the autonomy of local government in Colorado, a wide variety of programs are likely to proliferate throughout the state, as cities, counties, and the development community experiment to find optimal solutions for their jurisdictions.

Notes

1. *See, e.g.*, Legates, "Global Warming and the Hydrologic Cycle: How are the Occurrence of Floods, Droughts and Storms Likely to Change?" George C. Marshall Institute, Washington Roundtable on Science and Public Policy (April 14, 2004).

2. Cal. Health & Safety Code §§ 38501 *et seq.* (2008) (concerning the Global Solutions Act of 2006), available at www.arb.ca.gov/cc/docs/ab32text.pdf.

3. *See generally* comprehensive plans, CRS §§ 31-23-201 through -213 and 30-28-101 rhrough -110 and -119; Colorado Land Use Control Enabling Act, CRS §§ 29-20-101 through -107; zoning, municipalities, CRS §§ 31-23-301 through -314; zoning, counries, CRS §§ 30-28-111 through -139; subdivision, municipalities, CRS §§ 31-23-212 through -227; zoning, counties, CRS §§ 30-28-110, -133, -133.1, -133.5, -133.6, and -137; Colorado PUD Act, CRS §§ 24-67-101 through -108.

4. *City of Colorado Springs v. Securecare Self-Storage, Inc.*, 10 P.3d 1244 (Colo. 2000); *Denver v. State*, 788 P.2d 764 (Colo. 1990). *See also* Hartl and Hayes, "Home Rule in Colorado: Evolution or Devolution," 33 *The Colorado Lawyer* 61 (Jan. 2004).

5. The American Institute of Architects, "Survey Shows Only 7 Percent of Voters Know Top Cause of Greenhouse Gas Emission" (Sept. 10, 2007), available at www.aia.org/release_091007_voterpoll.

6. U.S. Green Building Council, www.usgbc.org.

7. H.R. 3221 was introduced in 2007 and folded into omnibus energy legislation, H.R. 6, which became Public Law Nos. 110-140 on Dec. 19, 2007. Funding for this legislation has nor yer been appropriated.

8. H.B. 01S2-1020 (provided an alternative dispute resolution process for municipalities and counties to resolve inconsistent master plans); H.B. 01S2-1006 (required that municipalities greater than 2,000 in population must adopr a master plan, an instance of the General Assembly incorrectly interchanging the term "master plan" with "comprehensive plan"); H.B. 01S2-1001 (placed additional restrictions on so-called "flagpole" annexations); S.B. 01S2-015 (created a set of standards and restrictions on local governments imposing impact fees for new development).

9. These cities are: Aspen, Boulder, Carbondale, Denver, Fort Collins, Glenwood Springs, and Telluride. The county is Boulder County.

10. Colorado Municipal League, "Energy Management and Conservation: Municipal Best Practices" (Sept. 2007), available at www.colorado.gov/energy/in/uploaded_pdf/EnergyMunicipalBestPractices.pdf.

11. "City of Aspen Canary Initiative: Climate Action Plan 2007-2009" at 14, available at www.canaryinitiative.com.

12. Office of Environmental Affairs, "City of Boulder Climate Action Plan" at 46, available at www.environmentalaffairs.com.

13. *Id.*

14. Interview with Michele Weingarden, Director, Greenprint Denver (Oct. 20, 2008).

15. These cities are: Aspen, Basalr, Boulder, Carbondale, Denver, Dillon, Durango, Frisco, Glenwood Springs, Gunnison, Nederland, New Castle, Pagosa Springs, Telluride, Town of Crested Butte, and Wesrminster.

16. The Kyoto Protocol goals for the United States are to reduce emissions of greenhouse gases 7 percent below 1990 levels by 2012. Kyoto Protocol to rhe Unired Nations Framework Convention on Climate Change, available at unfccc.int/resource/docs/convkp/kpeng.html. *See also* Schmidt and Williamson, "Recent Developments in Climate Change Law," 37 *The Colorado Lawyer* 63 (Nov. 2008).

17. U.S. Conference of Mayors Climate Protection Agreement, available at www.usmayors.org/climateprotection/agreement.htm.

18. Resolution No. 2005-9, City of Carbondale, available at www.carbondalegov.org/index.asp?Type=B_BASIC&SEC={79985CC7-8B67-4D89-A2CC-46331F3683E1}&DE=.

19. *Id.*

20. The municipalities are: Arvada, Aspen, Boulder, Carbondale, Denver, Durango, Fort Collins, Frisco, Golden, La Plata, Lafayette, Manitou Springs, and Westminster. The counties are: Gunnison and San Miguel.

21. The City of Boulder involved local renewable energy suppliers including Clean and Green; Community Energy, Inc.; Renewable Choice Energy; and Xcel Energy (Windsource Program). City of Boulder, "City of Boulder Challenges Community to Increase Wind Power Purchases" (Aug. 25, 2007), available at www.bouldercolorado.gov/index.php?option=com_content&task=view&id=1273&Itemid=165.

22. By the end of 2005, Boulder announced that it had exceeded its goals by adding 1,150 new wind power customers. The U.S. Environmental Protection Agency (EPA) designated Boulder a Green Power Community, the first Colorado city to receive such distinction. City of Boulder, "Boulder Exceeds Goals of Wind Challenge, Becomes Green Power Community" (Nov. 3, 2005), available at www.bouldercolorado.gov/index.php?option=com_content&task=view&id=1273&Itemid=165.

23. Klingsporn, "Town Launches Unplugged Campaign," *Telluride Daily Planet* (Oct. 1, 2006), available at www.telluridegateway.com/articles/2006/10/02/news/news01.txt.

24. Fort Collins Climate Task Force Recommendations (June 2008), available at fcgov.com/climateprotection/ctf.php.

25. Weingarden, *supra* note 14.

26. "Builder's Guide to Energy Efficient Home Construction," available at www.fcgov.com/electric/builders-guide/index.htm.

27. Weingarden, *supra* note 14.

28. S.B. 08-117 (concerning local government treatment of solar energy device permits), available at www.leg.state.co.us/CLICS/CLICS2008A/

csl.nsf/fsbillcont3/1109D26989FEC52B872573D000791515?Open&file=117_enr.pdf.

29. *Id.* These limits are effective until July 1, 2011.

30. Morton, "Excessive Suburban Fees Unwisely Discourage Solar Investors," *Rocky Mountain News* (Jan. 5, 2008), available at www.rockymountainnews.com/news/2008/jan/05/excessive-suburban-fees-unwisely-discourage-solar-/?printer=1.

31. Brown, "Proposed Law Would Cap Fees for Solar Permits," *Boulder County Bus. Report* (March 28, 2008) available at www.bcbr.com/article.asp?id=92286.

32. Weingarden, *supra* note 14.

33. City of Littleton, "Littleton Becomes First City in Colorado to Waive Fees for Solar Installation" (May 5, 2008), available at www.littletongov.org/news/releases/2008/nofeesolar.asp.

34. Community Office for Resource Efficiency, www.aspencore.org/sitepages/pid35.php.

35. *Id.*

36. U.S. Green Building Council, "LEED Rating Systems," available at www.usgbc.org/displaypage.aspx?cmspageid=222.

37. Metro Mayors Caucus, "LEED Rating Systems," available at www.metromayors.org/Housing.html.

38. City of Fort Collins, fcgov.com. Resolution 2008-015 adopted the goal of reducing emissions 20 percent below 2005 levels by 2020. Resolution 99-137 set the goal of reducing emissions 30 percent below predicted 2010 levels by 2010.

39. *Id.*

40. *Id.*

41. *Id.*

42. *Id.*

43. City of Golden, Resolution 1793 (Aug. 23, 2007), available at www.ci.golden.co.us/files/Res1793.pdf.

44. *Id.*

45. Colo. Const. art. XX, § 6.

46. The counties are: Adams, Arapahoe, and Larimer. The cities are: Arvada, Aurora, Basalt, Castle Rock, Centennial, Collbran, Cortez, Craig, DeBeque, Denver, Durango, Edgewater, Englewood, Fort Lupton, Frisco, Fruita, Golden, Grand Junction, Greeley, Greenwood Village, Horchkiss, Lakewood, Longmont, Louisville, Palisade, Parker, Salida, Thornton, and Westminster.

47. *See generally* Energy Efficienr Codes Coalition, "The 30% Solution," available at www.thirtypercentsolution.org/modules/smartsolution/page.php?pageid=1.

48. *See, e.g.*, Lovins *et al.*, *Small is Profitable* (Rocky Mountain Institute, 2002).

49. Green and Sagrillo, "Zoning for Distributed Wind Power—Breaking Down Barriers," Conference Paper, NREL/CP-500-38167 (Aug. 2005), available at www.engr.colostate.edu/ALP/Zoning_for_Distributed%20Wind.pdf.

50. *Id.*

51. H.B. 08-1270 amends CRS § 38-30-168 to permit homeowners to install alternative energy generation devices, such as solar panels and wind generators, and other select, energy-saving improvements, regardless of any prohibition in the recorded covenants, conditions, and restrictions applicable to the units within the association.

52. City of Boulder, "Solar Access Compliance," available ar www.bouldercolorado.gov/files/PDS/codes/solrshad.pdf.

53. B.R.C. § 9-9-17, available at www.colocode.com/boulder2/index.htm.

54. "New Land-Use Code Goes into Effect," *Aspen Times* (July 6, 2006), available at www.aspentimes.com/article/20060706/NEWS/107060052.

55. Snider, "Boulder County Approves Limits on House Sizes," *Daily Camera* (June 13, 2008), available at www.dailycamera.com/news/2008/jun/13/house-size-limits-pass.

56. *Id.*

57. *Id.*

58. U.S. Green Building Council, *supra* note 36.

59. *Id.*

60. *See generally* U.S. Green Building Council, www.usgbc.org.

61. U.S. Green Building Council, "LEED for Neighborhood Development," available at www.usgbc.org/DisplayPage.aspx?CMSPageID=148.

62. Klingsporn, *supra* note 23.

63. U.S. Green Building Council, "Frequently Asked Questions About LEED® for Neighborhood Development," available at www.usgbc.org/ShowFile.aspx?DocumentID=3357.

64. *See* www.usgbc.org.

65. *See* Weingarden, *supra* note 14.

66. Built Green Colorado & Home Builders Association of Metro Denver, www.builtgreen.org/information.htm.

67. Built Green Colorado & Home Builders Association of Metro Denver, "How does the program work?" available at www.builtgreen.org/about/overview.htm.

68. *Id.*

69. B.R.C. §§ 10-7.5 *et seq.*, available at www.colocode.com/boulder2/index.htm.

70. City of Boulder, "Residential Building Guide" 3 (April 2008), available ar www.bouldergreenpoints.com.

71. B.R.C. § 10-7.5-4 (Resource Conservation—Green Points).

72. *Id.*

73. B.R.C. § 10-7.5-3.

74. B.R.C. § 10-7.5-3(b).

75. Eagle County, "ECObuild," available at www.eaglecounty.us/commDev/ecobuild.cfm.

76. *Id.*

77. *Id.*

78. *Id.*

79. City of Aspen & Pitkin County, "Efficient Building Program," available at www.aspenpitkin.com/depts/41/bldg_efficient.cfm.

80. *Id.*

81. Town of Carbondale, "Carbondale Efficient Building Code Program," available at www.carbondalegov.org/index.asp?Type=B_BASIC&SEC=%7BB80708A8-F78A-43EE-9BFD-D6518259326C%7D.

82. *Id.*

83. *Id.*

84. City and County of Denver, "Blueprint Denver, an Integrated Transportation and Land Use Plan," available at www.denvergov.org/portals/145/documents/BlueprintDenver.pdf.

85. City and County of Denver, "Comprehensive Plan 2000," available at www.denvergov.org/Default.aspx?alias=www.denvergov.org/CompPlan.

86. Interview with Rebecca Clark, Director of Community Planning and Development, City of Lakewood (Sept. 9, 2008).

87. Clarion Associates, "Sustainable Development Code: A Code for rhe 21st Century," Beta Version 1.1., available at www.clarionassociares.com/pdf/Sustainable%20Community%20Development%20Code%20Beta%20Version%201.1.pdf.

88. *Id.*

89. *Id.*

90. *Id.*

91. Aspen and Pitkin County, "Renewable Energy Mitigation Program," available at www.newrules.org/environment/climateaspen.html.

92. City of Boulder, "Boulder Voters Pass First Energy Tax in the Nation" (Nov. 8, 2006), available at www.ci.boulder.co.us/index.php?option=com_content&task=view&id=6136&Itemid=169.

93. *Id.*

94. *Id.*

95. *Id.* ■