



COUNTY OF YOLO

General Services Department

Ray Groom
Director

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TO: **Mariko Yamada**, Chair
and Members of the Board of Supervisors

FROM: Ray Groom, Director of General Services

DATE: December 4, 2007

SUBJECT: County actions to account for and reduce green house gas emissions. No general fund impact.

RECOMMENDED ACTION:

Receive and file the attached report, provide general direction for future actions.

FISCAL IMPACT:

At this time no additional fiscal impacts are expected, any future requirement would be advanced to the Board of Supervisors for consideration and approval.

Background

Assembly Bill 32, also known the “California Global Warming Solutions Act of 2006,” is the first law to comprehensively limit greenhouse gas (GHG) emissions at the state level. AB 32 was introduced by Assembly Speaker Fabian Nunez and Assembly Member Fran Pavley, and was passed by the legislature and signed into law by Governor Schwarzenegger on September 27, 2006. Among other things, it establishes annual mandatory reporting of GHG emissions for significant sources and sets emission limits to cut the state’s GHG emissions to 1990 levels by 2020. This bill follows the October 2001 action by Governor Gray Davis when he signed Senate Bill 527 (SB 527) establishing the California Climatic Change Registry and mandating emission protocols.

AB 32 regulates greenhouse gas emissions in the state of California. As defined in the bill, “greenhouse gases” include all of the following gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydro fluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). These are the same gases listed as GHGs in the Kyoto Protocol.

The State Air Resources Board (ARB) is the state agency responsible for monitoring and regulating GHG emission sources under AB 32, and the details of the bill will be developed through ARB’s rule-making process.

AB 32 does not include a list of affected entities or sectors – instead it says it will regulate “any source, or category of sources, that the Air Resources Board determines as significant.” AB 32 states that mandatory reporting and reduction requirements will begin with the sources that contribute most to statewide emissions. Previous drafts of the bill specifically mentioned electricity, oil and gas, cement, and landfills as significant emitters. AB 32 does state that

emissions from electricity consumed in the state, including imported power, be reported. This means the state's investor-owned utilities, municipal utilities and load-serving entities can expect to be some of the first entities required to report and reduce GHG emissions.

Greenhouse gas sources are divided into several major categories. These categories account for more than 99% of the greenhouse gases produced by Yolo County (county government). The major elements are:

Direct greenhouse gas emissions are those emissions from applicable sources that are owned or controlled by the county and account for 50% of our emissions, including:

- Transportation emissions from vehicles owned or controlled by the county,
- Emissions from onsite combustion for the production of heat, steam, or electricity and
- Fugitive emissions such as methane leaks from pipeline systems and leaks of HFCs from air conditioning systems.

Indirect greenhouse gas emissions are emissions that occur because of a participant's actions, but are produced by sources owned or controlled by another entity. Examples of indirect emissions include emissions resulting from electricity use, business travel on commercial aircraft, or shipping products using a delivery service rather than the participant's own vehicles. Registry reporting requires that emissions be reported only for the following three types of indirect emissions sources and account for 49% of our emissions including:

- Electricity imports (power from PGE),
- Steam imports (Yolo has no reportable data for this category) and
- Heating and cooling obtained from district heating/cooling plants (Yolo has no reportable data for this category).

YOLO COUNTY ACTIONS

In July 2007 the County joined California Climatic Action Registry (CCAR) and started assembling the data to report our carbon for a base year of 2006. The county has very good records of our purchases of fuel, electricity and natural gas, all of which account for nearly 99% of our total greenhouse gas generation. In August we submitted a Total Emissions Summary Report to the CCAR, which details all of our emissions information for facilities, fleet and stationary sources for our 53 buildings and 916,401 square feet that are under direct control of the Board.

According to the protocols directed by the State and the CCAR the information and data that we submitted required an independent audit by an approved consultant. To select a consultant a Request for Proposal was issued by General Services. The contract was awarded to Tetrattech, a Rancho Cordova consulting firm. In November and early December 2007, Tetrattech, the California State Air Resources Board and the California Energy Commission conducted an audit on the carbon accounting submitted by the County. The audit concluded that the reporting of greenhouse gasses were consistent with the protocols and that the County contributed approximately 8,200 metric tones of greenhouse gas to the environment in calendar year 2006.

OTHER AGENCY INVOLVEMENT:

County Administrator's Office assists on a regular basis relating to emissions issues.

Report to the Yolo County Board of Supervisors

County actions to identify greenhouse gas and steps underway to reduce the impacts

Global Warming at a Glance

The 1990s were the warmest decade of the entire millennium, and 1998, 1999, and 2000 were three of the hottest years on record. Greenhouse gases affect climate by increasing the “greenhouse effect.” They concentrate in the earth’s atmosphere and trap heat by blocking some of the long-wave energy the earth normally radiates back to space; the resulting change in atmospheric energy balance affects both weather and climate.

There is widespread agreement among climate scientists worldwide that human activity is increasing the greenhouse gases in the earth’s atmosphere and accelerating global warming. While some greenhouse gases occur naturally, others are discharged into the atmosphere by certain human activities such as the burning of fossil fuels (coal, oil and natural gas for heating and electricity); gasoline and diesel for transportation; deforestation activities and some agricultural practices. The potential consequences of global warming – some of which are already occurring – include:

- More extreme weather events
- Dislocation of agricultural and commercial activities
- Expansion of desert regions
- A rise in sea levels
- Damaged natural habitats and ecosystems

The planet faces both increased flooding and increased drought. Extended heat waves, more powerful storms, and other extreme weather events will become more common. Rising sea levels will inundate portions of Florida and Louisiana, while increased storm surges will threaten communities all along the US coastline. Global temperatures are expected to rise by between 2.5 and 10.4 degrees F by 2100. Global sea level is expected to rise by a further 15 to 95 cm by the year 2100.

Impact of Climate Change in California

The sea level has risen along California's coast, by as much as 7 inches in the last 150 years. Another 8 - 12 inch rise could have severe impacts on the San Francisco Bay-Delta, which provides water to more than 20 million Californians. Salt-water intrusion into the Delta would degrade the quality of water we currently pump to the southern part of the state. With 1,600+ miles of coastline, many coastal cities will be vulnerable to a rise in sea level that could cause beach erosion and saltwater intrusion into estuaries and rivers used for agriculture. Coastal cities will also be at greater risk to extreme weather events associated with global warming.

The California mountain snow pack is shrinking. Warmer and shorter winters have reduced the annual snow pack, and the snow is melting earlier. Over the past 100 years, spring runoff has decreased by about 10 percent. At the same time, longer and hotter summers are increasing demand for water. New research by scientists at the Scripps Institution of Oceanography predicts that critical water sources will be cut by 15-30 percent in the 21st century.

The California Energy Commission has stated that the observed and projected impacts of climate change in California include hotter days, additional smog, sea level increase, and a 15 to 30 percent reduction in surface water supply to California's cities and farms over this century which will significantly impact agriculture and the food supply.

Over the last century, the average temperature in Fresno, California, has increased from 61.9 degrees F(1899-1928 average) to 63.3 degrees F (1966-1995 average), and precipitation has decreased by up to 20% in many parts of the state.

Agriculture: The mix of crop and livestock production in a state is influenced by climatic conditions and water availability. As climate warms, production patterns will shift northward. Increases in climate variability could make adaptation by farmers more difficult. Warmer climates and less soil moisture due to increased evaporation may increase the need for irrigation. However, these same conditions could decrease water supplies, which also may be needed by natural ecosystems, urban populations, and other economic sectors.

Human Health: Worsened air quality, increased risk of vector-borne diseases. Higher temperatures and increased frequency of heat waves may increase the number of heat-related illnesses. Cities such as Los Angeles that experience occasional very hot, dry weather may be especially susceptible. One study estimates that a 3 degree F warming could almost double the heat-related deaths in Los Angeles, from 70 (in 1997) to 125 (although increased air conditioning use may not have been fully accounted for). Little change in winter mortality is expected.

Ecosystems: Climate change could have an impact on many of California's species and ecosystems. Without natural corridors to allow migration, isolated species could be limited in their ability to adapt to climate change. Plant and animal species near the borders of their ranges are likely to be most affected. Climate change could create more opportunity for the establishment and spread of weeds and pests.

Based on 1998 data, a 20% reduction in GHG emissions from California would be greater than the total emissions from individual countries like Austria, Chile, Denmark, Sweden, Ireland, Norway, Luxembourg, Finland, and Portugal. California has the 6th largest economy in the world. What happens here matters!

Status of Yolo County

In October 2001, Governor Gray Davis signed Senate Bill 527 (SB 527) that defined the roles and responsibilities of the California Climate Action Registry (the Registry). The Registry allowed organizations to voluntarily report baseline and annual greenhouse gas (GHG) emissions results. In July 2007 Yolo County joined the Registry and submitted green house gas data for calendar year 2006 which will be our base year.

SB 527 recognizes the interest of the state to encourage voluntary actions to achieve economically beneficial reductions of GHG emissions. Organizations that make use of this opportunity and submit results certified in accordance with the provisions of the bill receive the state's commitment to use its best efforts to ensure that participating organizations receive appropriate consideration under any future international, federal, or state regulatory regime related to GHG emissions. Since then Assembly Bill 32, also known the "California Global

Warming Solutions Act of 2006,” was enacted as the first law to comprehensively limit greenhouse gas (GHG) emissions at the state level.

SB 527 directs the Energy Commission to provide guidance to the Registry on procedures and protocols for reporting GHG emissions. Additionally, the Energy Commission is to provide guidance for a certification protocol and for a process to qualify providers of technical assistance and certification services related to the Registry. Also, SB 527 specifies that the Energy Commission and Registry will develop industry specific reporting protocols.

Many provisions of SB 527 specify how Registry reporting is to be conducted. As provided by the bill, GHG emissions reporting to the Registry will include the following:

- Be based on entity-wide annual reporting, not reporting for individual projects.
- Apply to emissions in California and allow for reporting United States emissions.
- Include emissions of carbon dioxide during the first three years of participation and emissions of all of the GHGs covered under the Kyoto Protocol in subsequent years.
- Allow baselines to be set as far back as 1990, if sufficient data are available.
- Require baseline adjustments for certain changes in the structure of an organization.
- Be certified by an independent state and Registry approved third-party.

While specific in many respects, SB 527 leaves many details of reporting to be defined by the reporting protocol. This report provides guidance on these reporting details. The approaches described in this guidance draw on a wide range of sources, both foreign and domestic. The experience and recommendations of existing GHG reporting programs have been drawn heavily upon in formulating the recommendations contained in this report, in particular the World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) GHG protocol (WRI, 2001), a multistakeholder effort to develop a standardized approach to the voluntary reporting of GHG emissions.

In preparing the report, the Energy Commission and its contractor considered comments from a number of parties including the Registry, California Air Resources Board (CARB), U.S. Environmental Protection Agency (EPA), and a self-selected work group. The work group, which includes industry, environmental groups, government agencies, and the general public, has provided comments on "straw proposals" for portions of a general protocol. However, the material contained in this guidance does not reflect fully the views of any single party, nor does it necessarily reflect a consensus view on particular issues.

In November and early December 2007 the Registry, the California State Air Resources Board and the California Energy Commission conducted an audit on the carbon accounting submitted by the County. The audit concluded that the reporting of greenhouse gasses were consistent with the protocols and that the county contributed approximately 8.200 metric tones of green house gas to the environment.

Major carbon related actions completed by Yolo County

In July 2007 the County joined CCAR and established a base documented year of 2006.

At the 11 September 2007 Board meeting a CoolCounties Climate Stabilization Declaration was adopted. The declaration stated that the county would create an inventory of our county government (operational) greenhouse gas (“GHG”) emissions and implement policies, programs and operations to achieve significant, measurable and sustainable reduction of those

operational GHG emissions to help contribute to the regional reduction targets as identified in paragraph. The declaration also stated that the county would work closely with local, state, and federal governments and other leaders to reduce county geographical GHG emissions to 80 percent below current levels by 2050, by developing a GHG emissions inventory and regional plan that establishes short-, mid-, and long-term GHG reduction targets, with recommended goals to stop increasing emissions by 2010, and to achieve a 10 percent reduction every five years thereafter through to 2050.

Information Technology Department has standards that meet green criteria. The Electronic Product Environmental Assessment Tool (EPEAT) is a standard established by the Green Electronics Council. The EPEAT is a system in which manufacturers declare their products' conformance to a comprehensive set of environmental criteria in 8 environmental performance categories. Yolo County has standards that meet a silver criteria which means the computers we buy meet a 23 point standard for green efficiency plus 50% of the more stringent optional criteria that results in a greener operational cost (power consumption, earth friendly disposal, etc.)

At Board direction the county is designing the Winters and West Sacramento library replacement projects to meet LEED Silver criteria (same as the Bauer Building). The Winters project will include a new technology that freezes a large storage device during nighttime hours and uses the ice to reduce daytime cooling by as much as 60% during the next day. Both green buildings will result in reduced carbon and result in an earth friendly design.

The county operates a State recognized landfill operation Yolo County near Davis as a controlled bioreactor to attain a number of environmental and cost savings benefits. Yolo County requested the EPA grant regulatory flexibility from the Resource Conservation Recovery Act (RCRA) that precluded addition of useful bulk or non-containerized liquid amendments, and flexibility on other restrictions regarding landfill cover and containment. Liquids including groundwater, and possibly gray water and food-processing wastes normally having no beneficial use, can beneficially enhance the biodegradation of solid waste in a landfill. Yolo County is also evaluating the bottom linings of the site based on project performance, available controls, and environmental safeguards which have been demonstrated in our smaller-scale 9000-ton test program at the Yolo County Central Landfill. The release of greenhouse gas emissions is reduced both by higher recovery rates of landfill gas and from offsetting fossil fuel use with landfill gas energy. Methane, which comprises about 50-60% of landfill gas volume, is about 24.5 times more potent (mass per mass) as a greenhouse gas than carbon dioxide. Controlled land filling also eliminates fugitive emission beyond the 30-year post closure period.

In July 2007 the County was recognized as an EPA Green Power Partner. The U.S. Environmental Protection Agency (EPA) acknowledged the Yolo County's Bauer Health Building for making a significant impact by producing green power. This recognition program helps to reduce the risks associated with climate change by supporting technologies that are more sustainable for businesses and communities.

2002-2004 County Wide Energy Conservation Retrofit Project: Lighting, boilers, HVAC, economizers, chillers, VFD's, fans, co-generation equipment, water heaters, motors, etc and a countywide computer energy management system that provided electronic computerized climate control in all major county buildings- the project cost was \$5.8 million, the energy

savings will be \$6.9 million over 15 years or \$463,000 per year and the County received a PG&E rebate in the amount of \$253,273.

2002-2007 Participation with PG&E Energy Programs:

PG&E Rebate Program-County Wide Energy Conservation Retrofit Project

PG&E Rebate Program- Health Building Solar Project

PG&E Demand Bidding Program- Trade kilowatts for dollars by reducing load

PG&E Critical Peak Pricing- Discounts on non-critical peak days for customers able to reduce or shift electricity demand during critical peak days

2003-2009 Building Closure Plan: Close old buildings that lack energy efficiency and have other major problems with cost impact: Alcohol/Drug, Mental Health, Probation, Public Health, and County Service Center. In 2007/8 we intend to demolish five of the seven buildings that have extremely high energy cost. The project cost was \$550,000 (in FY 2007/8 ACO Budget); it will save \$2.6 million over 15 years or \$177,556 per year.

2003-2007 County Wide Air Quality Emissions Reduction Project: In 2003, the County had six emission sources (generators & boilers) that were not permitted by the Air District that had been in operation for twenty plus years, and did not have Best Available Retrofit Control Technology (BARCT) emission reduction controls on the units. The units are all not permitted and meet the Air Districts emissions standards. The cost to retrofit generators and boilers was included in the facilities annual operating budget. It resulted in reduced emissions thereby cleaning the environment and avoided severe fines from Yolo- Solano Air Quality Management District.

2004-2006 County Health Building Project: Sustainable design, energy efficient, green office building project - Leeds Silver equivalent. The building has a renewable energy source, optimized energy performance reduction, water miser technologies (waterless urinals save more than 400,000 gallons of water per year), light pollution (light that bleeds outside of our property, landscape design is water efficient- reducing needs by 50%, the building has an extremely efficient heating and cooling process and many of the features have low ozone impact. The initial project cost was \$9 million (we lease it and will own it at the end of 20 years) the facility affords a 30% reduction in energy for similar non-LEED building.

2006 Solar Energy Health Building Project: The project was to install a 147,000 KW renewable solar energy the largest high tech plastic solar cell installation in northern California. The solar system produces the equivalent energy used by 200 homes, leaving that energy on the grid for use by other ratepayers and uses. Annually, the solar system reduces 600 tons of carbon dioxide from being emitted into the atmosphere as produced by a typical gas-fired power plant. It takes 50 acres of trees to absorb that much CO₂ from the atmosphere annually. The system produces 40% of the total energy needs for the building. The project cost of \$1.043 million will result in an energy savings of \$1.05 million over 15 years or \$70,000 per year. The county received a PG&E Rebate in the amount of \$397,981 to offset the cost thereby reducing our total expenses by nearly \$400,000 and reducing our greenhouse gas generation by 600 metric tons.

Major future actions under consideration

To achieve a minimum reduction of 10% each year as referenced in the CoolCounty initiative the following actions will be necessary. These actions are achievable and if every county employee takes action we can easily exceed the 10% reduction.

Develop a greenhouse gas adverse purchasing policy that mandates all purchases of electrical equipment meet or exceed the PGE Energy Star rating. This would require departments to purchase improved efficiency refrigerators, microwaves and related appliances that have greater power efficiencies and less greenhouse gas impacts.

Mandate that departments replace refrigerators and related electrical appliances over a two-year period with Energy Star units. This project would replace all old appliances in the county that are not energy efficient and reduce consumption. Example: The County has more than fifty refrigerators that are over twenty years old. These can be replaced to save energy (as well as reducing older ozone damaging refrigerants). Going to an energy star unit will reduce electrical consumption and therefore emissions by 5-7 %. We are working with PG&E to see if we can get a block rebate if we do a single replacement action.

Request departments reduce their use of electricity. Turning off lights, computers and monitors saves emissions every day.

Request Departments reduce their use of vehicles by 10%, which will reduce our carbon footprint by more than 180 metric tons.

Adjustments to automobile purchases (smaller cars – smaller engines). Assuming we start transitioning to small engines and vehicles, if we start reducing the vehicles engine size by 66% of our annual purchases for sedans we will reduce emissions by 8-9 % each year resulting in more than 30% reduction in five years. That will reduce our carbon emissions by approximately 172 metric tons each year.

Approve a cogeneration modification project as a component of the Monroe Detention Facility Expansion Project (new jail): This project uses the natural gas cogeneration unit to produce most of the electrical demand from the jail expansion. The unit currently has excess capacity and the addition of the jail expansion load will make the unit more efficient. The cost will be included in the jail expansion project and result in a substantial energy savings. The county will apply for PG&E rebates once designed.

County Wide Computer Energy Management Conservation Project Phase 2: This project is planned to utilize the computer energy management system to adjust building operations to reduce energy consumption. In addition, this project will look at specific energy conservation measures that can be implemented to reduce energy consumption. Each potential reduction measure will be evaluated for cost benefit. An example is the Administration Building automatic doors on the first floor. The doors currently are too wide and both doors stay open too long on automatic operation thereby wasting energy. Reducing the size of the openings and making only one of the doors will reduce our temperature loss by sixty-six per cent. The cost benefit evaluation will verify that this measure is a cost effective savings. The lighting in the Administration building and the Courthouse also will be evaluated as there are new lighting technologies that will increase efficiency and reduce operating cost (less emissions- lower environmental impact).

Direct General Services to make appropriate heating and air conditioning adjustments that will reduce the use of hydrocarbon consuming equipment. This would mean that buildings would be cooled and heated a little less but could reduce our greenhouse gases by hundreds of tons of carbon annually.

General Services manages energy consumption and use every day through our countywide computer energy management system. We also monitor and evaluate our energy use quarterly. We know which buildings use the most energy, and which ones are the most efficient and inefficient. Our older buildings are the most energy inefficient. The county has a long-range master plan that replaces old facilities with new ones in addition to upgrades and renovations. This type of progress improves and reduces our energy consumption and our environmental impacts. Every project in the county is planned with energy use and conservation in mind. The Health Building is a great example of that. The building was built primarily to solve a space need, but it was also an energy project.

Energy conservation is a primary focus within General Services. We are in the process of planning how we can implement our County Wide Energy Conservation Project Phase 2 in a cost effective manner while successfully conserving energy. We are also working with PG&E on a number of programs that have a good potential for improving our energy conservation and reducing the cost to our taxpayers.

Finally, we have partnered with a UCD Engineering class to evaluate our buildings, fleet and systems. This partnership was conceived as an independent assessment of our environmental impacts and carbon generation. The review fostered significant study opportunities and perspectives on developing policies and strategies on lowering our environmental impacts is good government. At the 11 December Board meeting the class will present its findings and policy comments to the Board of Supervisors. The presentation will focus on:

- Energy use, conservation, increasing efficiency
- Building energy audits with recommended energy management system settings and improvements that result in better decision making
- Modifications to the fleet of vehicles and stationary sources that result in reduced GHG

It is General Service's intent that this work is good public action. While the county gains analysis and a perspective from very bright professionals and students, the involvement of students and professors adds value by increasing public involvement. It is hoped that some of these students will see that their involvement in local government can impact their future and change their community.