County of Yolo

PLANNING AND PUBLIC WORKS DEPARTMENT

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PLANNING COMMISSION STAFF REPORT **August 12, 2010**

FILE #2009-043: Conduct a workshop regarding progress on the proposed Climate Action Plan; take comments from the public and provide comments to staff regarding work on the Climate Action Plan.

APPLICANT: Yolo County Planning and Public Works Department
292 West Beamer Street
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LOCATION: Countywide
GENERAL PLAN: N/A
ZONING: N/A

SUPERVISORIAL DISTRICT: All
SOILS: N/A
FLOOD ZONE: N/A
FIRE SEVERITY ZONE: N/A

ENVIRONMENTAL DETERMINATION: Environmental Impact Report

REPORT PREPARED BY:

for Heidi Tschudin, Project Manager

for David Morrison, Assistant Director

Don Rust, Principal Planner

RECOMMENDED ACTIONS

That the Planning Commission take the following action:

1. Hold a public workshop to receive public comments; and
2. Provide comments and direction to staff.

REASONS FOR RECOMMENDED ACTIONS

To conduct a workshop regarding progress on the County's Climate Action Plan including taking comments from the public and providing comments to staff regarding work on the document. The Climate Action Plan (CAP) satisfies the requirements of Action CO-A115 of the 2030

General Plan, and will also ensure compliance with Assembly Bill 32, Senate Bill 375, and other state/federal requirements that are being developed to regulate greenhouse gas emissions.

Pursuant to Action CO-115 of the General Plan, once the CAP is adopted it is to be amended into the 2030 General Plan. All County operations and actions, as well as land use approvals, will be required to be consistent with this plan. In addition, pursuant to General Plan CO-A115 the CAP must be in place prior to adoption of any specific plan, including the Dunnigan Specific Plan which is currently underway.

BACKGROUND

A balance of naturally occurring greenhouse gases (GHGs) in the earth's atmosphere is responsible for maintaining a habitable climate. Emissions from human activities, such as the production of energy, motor vehicle use, and some agriculture practices are elevating the concentrations of GHGs in the atmosphere, and have led to increasing instability in the earth's climate. This is known as climate change. Carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) are the primary GHGs. Other greenhouse gases of concern include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). When concentrations of these gases exceed natural concentrations in the atmosphere, the greenhouse effect is enhanced and global warming occurs.

California's major initiatives for reducing climate change and GHG emissions are summarized below:

- **Pavley Vehicle Emissions Standards (AB 1493, 2002)** -- This law requires California to establish new standards for motor vehicle greenhouse gas emissions. The ARB-adopted regulations will reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016.

- **2050 GHG Target (Executive Order S-3-05, 2005)** – This Executive Order establishes a GHG emissions target for the State of 80 percent below 1990 levels by 2050.

- **Global Warming Solutions Act (AB 32, 2006)** – This law requires the establishment of regulatory and market mechanisms to reductions of greenhouse gas emissions California to 1990 levels by 2020.

- **Low Carbon Fuel Standard (Executive Order S-01-07, 2007)** -- This Executive Order establishes a new Low Carbon Fuel Standard (LCFS) for transportation fuels sold in California. By 2020 the standard requires that the carbon intensity of California's passenger vehicle fuels be reduced by at least 10 percent.

- **Sustainable Communities and Transportation Planning (SB 375, 2008)** -- This law requires the ARB to develop regional greenhouse gas emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035 that would be implemented through a "sustainable communities strategy" (SCS) to be adopted in each of the Metropolitan Planning Areas (MPOs) throughout the state including the Sacramento Area Council of Governments (SACOG) of which Yolo County is a member agency. The focus of the SCS is to reduce the amount of vehicle miles traveled (VMT) within the applicable regions and demonstrate the ability for the region to attain ARB's targets.

We know that how California communities are designed and built has large consequences on the State's GHG emission levels, and as a result, has an impact on global climate change. The majority of the State's greenhouse gas (GHG) emissions are the result of infrastructure and development decisions: how we build our buildings, where we put them, and the quality and type of infrastructure that are required to serve them. The County's new 2030 General Plan adopted in November of 2009 addresses those issues for unincorporated Yolo County, and establishes a land use pattern and strategy of policies and actions that will result in reductions in local GHG emissions.

Policies and actions incorporating the concepts of "smart growth", and climate change are prominent in every element of the 2030 General Plan. These concepts are also fundamental to the County's commitment towards protecting agriculture and open space, as well as creating communities characterized by neighborhoods that are compact, walkable, and have a variety of commercial and residential uses. There are over 300 policies and action that serve to reduce GHG emissions and address climate change issues. Two actions of particular relevance to today's workshop are:

Action CO-A1115
Develop a Greenhouse Gas (GHG) Emissions Reduction Plan and/or Climate Action Plan (CAP) for the County, to control and reduce net GHG emissions, and to address economic and social adaptation to the effects of climate change. Development of this plan(s) shall include the following steps:

1) Conduct a baseline analysis (GHG emissions inventory) for 1990 or most appropriate baseline year;
2) Adopt an emissions reduction target;
3) Develop strategies and actions for reducing emissions including direct offsets and fees to purchase offsets;
4) Develop strategies and actions for adaptation to climate change;
5) Implement strategies and actions; and
6) Monitor emissions and verify results a minimum of every five years starting in 2010.

Utilize the 1982 Energy Plan as a starting point for this effort. Encourage collaboration with the cities to include the incorporated areas in the plan(s). Amend the General Plan to include the plan(s) after adoption. Require County operations and actions, as well as land use approvals to be consistent with this plan(s). This plan must be in place prior to adoption of any specific plan. (Policy CO-8.1)

Action CO-A115.1
In the interim until the GHG Emissions Reduction Plan/Climate Action Plan is in effect, the following significance thresholds shall be used for project analysis:

- Projects consistent with the General Plan and otherwise exempt under CEQA – Assumed to be de minimus.

- Projects consistent with the General Plan and subject to CEQA – Net zero threshold to be achieved by the applicant as follows:

-Apply practical and reasonable design components and operational protocols to reduce project GHGs emissions to the lowest feasible levels;

-Use verifiable offsets to achieve remaining GHG reductions to the greatest feasible extent, offsets shall be: locally based, project relevant, and consistent with other long term goals of the County. (Policy CO-8.9).

CLIMATE ACTION PLAN (CAP) HISTORY

The CAP will provide a strategy for GHG reductions, smart growth implementation, and adaptation to global climate change. A Request for Proposal (RFP) was prepared and circulated on November 5, 2009. Eleven firms responded to the RFP and four firms were interviewed. AECOM Technical Services, Inc. (previously known as EDAW) was chosen as the most qualified firm for the work and has been under contract since February 9, 2010. The firm is preeminent in the field and is one of the few with significant experience preparing CAPs statewide.

The scope of work includes the following tasks:

A. Review and refine the 2008 and 2030 GHG inventories for unincorporated Yolo County;

B. Conduct a baseline analysis (GHG emissions inventory) for 1990 or other appropriate recommended historic year, utilizing the 1982 Energy Plan as a starting point for this effort;

C. Adopt an emissions reduction target for the years 2020, 2030, 2040 and 2050;

D. Develop strategies and actions/programs for reducing emissions, including direct offsets and fees to purchase offsets. Also, identify secondary strategies to employ if the adopted program is not successful, or is less successful than anticipated, in achieving required reductions;

E. Develop strategies and actions/programs for adaptation to climate change;

F. Develop California Environmental Quality Act (CEQA) Thresholds of Significance for use in evaluating future development projects consistent with the General Plan;

G. Create an on-line carbon calculator to provide potential applicants with an easy-to-use tool for estimating the GHG emissions of their proposed project. The calculator will also provide a menu of actions and programs that can be used to meet targets, and to estimate the costs associated with compliance; and

H. Develop a methodology for monitoring emissions and verifying the results of the SGIP every five years, beginning in 2010.

To date, drafts of items A through E are substantially completed and discussed herein. Items F, G. and H are underway.

OUTREACH

Staff has undertaken considerable public outreach as a part of this process. The following summarizes various efforts in this regard:

Agricultural/Rural/Open Space Stakeholders -- As disclosed in the General Plan EIR and explained more below in the discussion of the inventories, the agricultural sector in Yolo County generates more GHG emissions within the unincorporated area than any other sector. This contrasts significantly with the state as a whole and most communities where the transportation sector is the largest emitter. As such it was recognized early in the process that this sector would have an important role in assisting with the development of the CAP and accomplishing necessary reductions. In light of this staff created a stakeholder group to provide input to the process.

Two workshops with this group have been held to date, one on May 6, 2010 and one on July 29, 2010. There were 13 participants in each workshop, representing a variety of interests within the sector. The inventories and strategies have and continue to be refined based on the input from attendees at these meetings. This is especially important in ensuring that the inventories are as accurate as possible and that the reduction measures are reasonable and feasible.

Climate Change Compact -- Staff has briefed the Yolo Climate Change Compact twice to date (April 9, 2010 and June 11, 2010) to both ensure awareness of the County's efforts, but also to ensure coordination on key assumptions. A third briefing will occur on August 13, 2010, covering the same materials addressed in this report.

Attorney General's Office – The State Attorney General has played a significant role in increasing awareness of climate change issues at the local level and the relationship of those issues to local land use control. Representatives of the Attorney General's office were briefed during the County's General Plan Update process and were very supportive of the County's history of land use decisions and land use philosophy as embedded in the General Plan. On July 1, 2010, staff met with representatives of that Office again to brief them on the development of the CAP, including the county's overall direction and information gathering to date. The Attorney General's Office continues to be very supportive of the County's efforts, methodologies, and approach.

Sacramento Area Council of Governments (SACOG) – Two thirds of the CAP budget ($100,000 of $150,000 budget) is funded through a grant from SACOG. Staff has been updating SACOG staff regularly regarding progress on the CAP as a requirement of the grant funding program. In addition meetings with various SACOG staff were held June 11, 2010 to discuss the CAP effort is greater detail. Discussion included identification of efforts needed to ensure local CAP inventories add up to the SACOG regional inventory, and make sense in terms of regional implementation of both AB 32 and SB 375. There was also discussion regarding efforts to utilize the Yolo County methodology for the agricultural sector as a model for the rest of the SACOG region.

Dunnigan Specific Plan Developer Group – The Dunnigan Specific Plan (DSP) is the largest growth area in the 2030 General Plan and the County has received a preliminary application for the Dunnigan Specific Plan (DSP) from the Dunnigan Landowner Group (applicants). As part of the overall project, the applicants have funded $50,000 in consultant costs of the CAP. The CAP is required to be in place prior to adoption of the DSP, and the DSP is required to include consistent climate action efforts. It Is anticipated that the DSP will be responsible for the bulk of the CAP action items related to new growth. Staff met with the DSP representative on July 26, 2010 to coordinate regarding appropriate growth assumptions for the DSP area, and also to provide an update on the CAP efforts and direction to ensure incorporation of appropriate CAP strategies into the Draft DSP.

Yolo Solano Air Quality Management District (AQMD) – The Yolo-Solano AQMD implements State and federal air quality regulations for the region through authority delegated from the CARB. Staff met with the AQMD staff prior to commencing the CAP work and is scheduled to meet with them again August 10, 2010 to update them regarding the County's progress.

Internal Coordination within Yolo County -- The CAP team has worked directly with the following County departments and divisions to coordinate regarding the CAP and related efforts: Public Works, Waste Management, Natural Resources, Economic Development, General Services, and Agricultural Commissioner. Coordination will continue throughout the process.

GHG INVENTORY RESULTS

The purpose of the GHG inventory is to identify and understand emissions from various activities and thereby allow for the development of programs and strategies to control and manage those emissions. Without an understanding of the relative magnitude of emissions from various industries and activities it is not possible to evaluate and debate the relative merits of various reduction efforts. Understanding the inventory also allows for recognition of those portions of the inventory over which the County has no control. Examples include emissions from: the Port of West Sacramento; stationary sources; construction equipment; pass-through traffic on freeways and highways; land uses within the incorporated cities; activities and land uses controlled by the University of California at Davis (UCD); and activities and land uses on tribal trust land.

The consulting team has completed emissions inventories for 1990 and 2008 (see Attachments A and B). These two years were chosen in order to ensure compliance with AB 32. The 1990 data provides the "historic" inventory and the 2008 data provides the "base year" inventory. These inventories reflect the latest industry standards for similar efforts; however, it is important to point out that currently there are no agency-adopted protocols for this work, and furthermore the state of the practice continues to rapidly evolve based on improved science, new regulation, and legal outcomes, among other factors.

Rather than use general assumptions and statewide rates averaged out by land use type, or other top-down approaches that are widely used in developing inventories, the consultants employed a bottom-up approach that utilized actual data specific to Yolo County from a variety of available sources. Each inventory is broken down into the following sectors: energy, transportation, solid waste, stationary sources, construction and mining, agriculture, and waste water treatment.

As shown on the summary table below, total GHG emissions for the unincorporated area in metric tons (MT) of carbon dioxide equivalents (CO_2e) per year were 613,651 in 1990 as compared to 651,740 in 2008. Pursuant to AB 32, the 1990 number represents the County's reduction target for 2020. In other words, in order to satisfy AB 32, emissions would have to be reduced by 38,089 MT CO_2e (or 5.8%) from the current (base-year 2008) inventory and held at that rate for the next ten years notwithstanding population and economic growth over that period.

The 2008 inventory replaces the 2008 estimate developed for the General Plan Environmental Impact Report (EIR) of 1,883,000 MT CO_2e generated within the unincorporated area. This number has been shown to have been significantly overstated. This was in part a reflection of the state of the field at that time and in part a reflection of the more generalized "top down" method used to compile the General Plan estimate.

The 1990 inventory includes estimates of the historic emissions for the entire county. Unincorporated area emissions of 613,651 MT CO_2e for 1990 comprise approximately 31 percent of the estimated 1,995,840 MT CO_2e emissions for the entire County (including the four cities, the university, the tribe, the port, etc) that year. These numbers indicate that the unincorporated area (621,224 acres) which represents 95 percent of the land within Yolo County (653,549 acres total) accounts for just 31 percent of the emissions. Since developed land uses within the unincorporated area (currently 19,685 acres and planned for as much as 25,227 acres under the General Plan) total less than four percent of the total county area that is not surprising.

Unincorporated Yolo County Greenhouse Gas Emissions Inventory					
Emissions Sector	1990 Historic Inventory		2008 Base-Year Inventory		
	MT CO_2e	%	MT CO_2e	%	Change from 1990
Energy Consumption[1]	131,652	21.5%	181,447	27.8%	37.8%
Transportation	155,577	25.4%	105,253	16.2%	-32.3%
Solid Waste	1,654	0.3%	6,871	1.1%	325.5%
Agriculture	292,032	47.6%	297,341	45.6%	1.8%
Residue Burning	14,669	5.0%	13,917	4.7%	-5.1%
Livestock	30,000	10.3%	45,257	15.2%	50.9%
Rice Cultivation	28,389	9.7%	34,131	11.5%	20.2%
Farm Equipment	72,170	24.7%	71,667	24.1%	-0.7%
Agricultural Irrigation Pumps	39,231	13.4%	39,231	13.2%	0.0%
Pesticide Application	83	0.0%	35	0.0%	-58.4%
Fertilizer Application	98,982	33.9%	79,966	26.9%	-19.2%
Lime Application	4,344	1.5%	11,774	4.0%	171.0%
Urea Application	4,164	1.4%	1,362	0.5%	-67.3%
Wastewater Treatment	256	0.0%	974	0.1%	281.1%
Construction & Mining	14,954	2.4%	29,271	4.5%	95.7%
Stationary Sources	17,526	2.9%	30,583	4.7%	74.5%
Facilities	3,974	22.7%	8,220	26.9%	106.9%
Agricultural Processing	10,905	62.2%	16,483	53.9%	51.1%
Equipment	2,647	15.1%	5,880	19.2%	122.2%
Total[2]	**613,651**	**100%**	**651,740**	**100%**	**12.5%**

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons.
[1] Energy consumption includes emissions from electricity production, from natural gas and propane combustion, and domestic water consumption.
[2] Totals may not match exactly the sum of the numbers in the applicable column due to rounding.
Source: Data compiled by Ascent Environmental, Inc. and AECOM in 2010.

Over 90 percent of the emissions in both scenarios come from the top three sectors: agriculture, transportation and energy consumption.

1990	2008
Agriculture (47.6%)	Agriculture (45.6%)
Transportation (25.4%)	Energy Consumption (27.8%)
Energy Consumption (21.5%)	Transportation (16.2%)
Stationary Sources (2.9%)	Stationary Sources (4.7%)
Construction and Mining (2.4%)	Construction and Mining (4.5%)
Solid Waste (0.3%)	Solid Waste (1.1%)
Wastewater (0.0%)	Wastewater (0.1%)

This means that for maximum effect, the CAP reduction measures will need to achieve the greatest reductions in these areas.

GHG EMISSION PROJECTIONS

As noted above, the County's AB 32 reduction target is 613,651 MT CO2e in 2020. However, the effort to reduce GHG emissions obviously does not end in 2020. As a part of the CAP, the consultant team is also developing GHG emission projections for 2030, 2040, and 2050. The CAP 2030 projection will replace the 2030 projection developed as a part of the General Plan EIR analysis, which assumed full build-out of the General Plan by 2030. The CAP projections are based on assumptions about the rate at which planned land uses (per the County General

Plan), will build-out over time, using market and economic information. This work was not completed in time for inclusion in this report. Staff will present this information to the Planning Commission at the workshop.

In conjunction with the development of the emission projections, the CAP team will be developing proposed local reduction targets for each projection year. For example, the State reduction target for 2050 is 80 percent below 1990 levels. The County will be developing targets for 2030, 2040, and 2050. Currently the only reduction target mandated in State law is the target of 1990 levels by 2020.

The proposed local reduction targets for each projection year will be developed later in the process and presented to the public and decision makers at that time.

GHG REDUCTION STRATEGIES

The foundation of the County's climate change and GHG reduction philosophy is embodied in the 2030 General Plan land use map, policies, and growth management. The General Plan land use map incorporates all the elements of smart growth and GHG reduction, and the various General Plan elements contain over 300 policies and actions related to GHG reductions, smart growth implementation, and adaptation to global climate change. The purpose of the CAP is to translate that philosophical commitment into real-world applications that take into account the effect by sector and can be aggregated to show the total quantified results of the County's approach, with the goal of achieving the target reductions.

The consulting team has drafted a list of recommended GHG reduction measures, mechanisms, and performance standards for inclusion in the CAP (see Attachment 3). These were developed by consolidating the applicable General Plan policies and actions into 36 recommended CAP measures corresponding to emission sectors and subsectors from the GHG emissions inventories. The Draft CAP will contain a table cross-referencing each reduction measure and mechanism to adopted General Plan policies and actions. It will also provide the estimated GHG reduction potential and cost of each measure, and will contain an implementation program specifying responsible County departments and agencies for each measure and mechanism.

Each reduction measure relies on one or more reduction mechanisms. A total of 119 reduction mechanisms are proposed for consideration at this time. It is anticipated that the number of reduction mechanisms will be further reduced or consolidated as the Draft CAP is prepared based on community comments, staff review, and cost-benefit characteristics determined for each measure.

The reduction measures are presented in the following format:

Sector – The applicable economic activity category, as expressed in the GHG emissions inventories. Adaptation to climate change is also addressed as a "sector" within the CAP.

Subsector – The portion of the applicable sector to be addressed through the proposed reduction measure and mechanism. Subsectors are identified in the GHG emissions inventories.

Measure – The specific activity or practice that the County seeks to influence in order to reduce GHG emissions consistent with General Plan policies and actions.

Mechanism – The direction or way in which the County seeks to influence the proposed measure.

Performance Indicator – The metric(s) the County will use to quantify potential GHG reductions for each measure and mechanism. Performance indicators will be tracked over time in order to report CAP implementation progress.

The reduction measures are also sorted into tiers based on their likely success in reducing substantial amounts of GHG emissions, potential cost-effectiveness, and level of quantification confidence based on available science. This categorization by tier is preliminary and is likely to change based on information derived from subsequent steps in the drafting of the CAP.

Tier I includes measures most likely to achieve the largest reductions within the appropriate sectors and most reliably and defensibly measurable.

Tier II consists of fall back measures to which the County can turn in the future if the performance of the Tier I measures is less effective than expected.

Tier III consists of measures that are important to overall CAP reduction program, but for which there is no reliable quantification method. Tier III also applies to measures and mechanisms that are not accounted for within the GHG inventory.

Tier IV measures address how the County will adapt to rising sea levels, droughts, floods, fires and other phenomena that may result from the effects of climate change. These are identified as "Tier IV measures" and isolated within the "adaptation" sector. They do not have measurable performance criteria.

Staff will review these measures with the Commission during the workshop.

REMAINING TASKS AND SCHEDULE

Pursuant to the scope of work, the following tasks remain:

- Develop California Environmental Quality Act (CEQA) Thresholds of Significance for use in evaluating future development projects consistent with the General Plan;

- Create an on-line carbon calculator to provide potential applicants with an easy-to-use tool for estimating the GHG emissions of their proposed project; and

- Develop a methodology for monitoring emissions and verifying the results of the SGIP every five years, beginning in 2010.

This work is underway and will be presented to the public and decision-makers as part of the soon to be released Draft CAP. At this time it is anticipated that the draft document will be released in the Fall with adoption hearings planned by the end of the year.

ATTACHMENTS

Attachment 1 -- Historic Greenhouse Gas Emissions Inventory Results and Peer Review of the Base-Year and Build-out Inventories

Attachment 2 – Base-year Greenhouse Gas Emissions Inventory, Future Year Projections, and Reduction Target Recommendation

Attachment 3 – Greenhouse Gas Reductions Measures Memorandum

Note: Attachments 1 and 2 will be provided separately on August 9th, 2010. Attachment 3 is included.

ATTACHMENT 3

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Memorandum

To	Heidi Tschudin, David Morrison, Don Rust	Page	1
CC	Honey Walters, Claire Bonham-Carter		
Subject	Proposed Measures for Yolo County Climate Action Plan		
From	Jeff Henderson and Culley Thomas		
Date	August 5, 2010		

The attached table provides a list of recommended Yolo County Climate Action Plan (CAP) greenhouse gas (GHG) reduction measures, mechanisms, and performance standards. This material is provided for consideration by the Yolo County Planning Commission, and Yolo Climate Compact at upcoming meetings in July and August 2010. It reflects input from County staff, and the Agricultural/Rural/Open Space stakeholders group at their meeting on July 29, 2010. This memo describes the process AECOM used to assemble these materials.

AECOM reviewed over 300 climate change-related policies and actions identified within the Yolo County General Plan. The review identified substantial overlap between policies drawn from throughout the General Plan. In addition, some measures contain multiple emission reduction mechanisms that need to be separated for quantification purposes. However, the policies and actions form a robust platform for the CAP to build on.

Following this review, the General Plan policies were sorted by applicable emissions sector, including *agriculture, energy, transportation and land use, solid waste,* and *wastewater treatment*[1]. Each policy was categorized into an overarching climate action strategy and applicable emissions reduction mechanisms were identified.

AECOM then consolidated the 300+ climate change-related General Plan policies into 36 recommended CAP measures corresponding to emission sectors and subsectors from the GHG emissions inventory. Each reduction measure relies on one or more reduction mechanism. A total of 119 reduction mechanisms are recommended for consideration at this time. It is anticipated that the number of reduction mechanisms will be further reduced or consolidated as the Draft CAP is prepared based on community comments, staff review, and cost-benefit characteristics determined for each measure. The Draft CAP will contain a table cross-referencing each reduction measure and mechanism to adopted General Plan policies. It will also provide the estimated GHG reduction potential and cost of each measure, and will contain an implementation program specifying responsible County departments and agencies for each measure and mechanism.

The attached table identifies the following components of the recommended CAP:

Sector – The applicable economic activity category, as expressed in the GHG emissions inventory. Sectors addressed within the Yolo County CAP include: agriculture, energy, transportation and land

[1] *Only one policy related to the construction and mining sector and no policies related to the stationary sources sector were encountered during this review. For this reason, the sectors were omitted from the list. The one construction and mining sector-related policy was merged into the energy sector.*

use, solid waste, and water. Adaptation to climate change is also addressed as a "sector" within the CAP.

Subsector – The portion of the applicable sector to be addressed through the proposed reduction measure and mechanism. Subsectors are identified in the GHG emissions inventory.

Measure – Identifies the specific activity or practice that the County seeks to influence in order to reduce GHG emissions consistent with General Plan policies and actions.

Mechanism – Describes the direction or way in which the County seeks to influence the proposed measure.

Performance Indicator – Provides the metric(s) the County will use to quantify potential GHG reductions for each measure and mechanism. Performance indicators will be tracked over time in order to report CAP implementation progress.

Tier – The reduction measures and mechanisms are also sorted into tiers based on their likely effect in reducing substantial amounts of GHG emissions, potential cost-effectiveness, and level of quantification confidence based on available science. The attached table presents a *preliminary* assessment of the assignment of each measure and mechanism to one of four tiers, as follows:

- *Tier I* includes measures most likely to achieve the largest reductions within the appropriate sectors and most reliably and defensibly measurable.

- *Tier II* consists of fall back measures to which the County can turn in the future if the performance of the Tier I measures is less effective than expected.

- *Tier III* consists of measures that are important to overall CAP reduction program, but for which there is no reliable quantification method. Tier III also applies to measures and mechanisms that are not accounted for within the GHG inventory.

- *Tier IV* measures address how the County will adapt to rising sea levels, droughts, floods, fires and other phenomena that may result from the effects of climate change. These are identified as "Tier IV measures" and isolated within the "adaptation" sector. They do not have measurable performance criteria.

Assignment of individual measures and mechanisms to tiers will fluctuate as preliminary measures and mechanisms are refined, quantified, and evaluated for cost-effectiveness.

We recommend that these materials be presented to the County Planning Commission and Yolo Climate Change Compact to assist in the process of refining the recommended CAP. In the meantime, AECOM will continue to work toward quantifying the GHG reduction potential and cost-effectiveness of the range of recommended measures and mechanisms. Following these processes, a refined list of recommended measures and mechanisms will be used to construct the Draft CAP for public release and presentation to the Board of Supervisors.

Agriculture Sector

Inventory	Reductions			Rating
Subsector	Measure	Mechanism	Performance Indicator	Tier
Nitrogen Fertilizer Application / Soil Management	AG-1 Reduce agriculture-related nitrous oxide emissions	A-1.1 Nitrogen Fertilizer application reduction	X acres of crop X with 25% reduction in mineral nitrogen fertilizer application	Tier I
		A-1.2 Conservation tillage (N_2O reduction)	X acres of crop X converted to conservation tillage (no till or reduced till)	Tier II
		A-1.3 Winter cover cropping	X acres of crop X that implements winter cover cropping	Tier II
		A-1.4 Organic nitrogen fertilizer application	X acres of crop X that switch from mineral to organic nitrogen fertilizers (e.g., manure, chicken feathers)	Tier II
		A-1.5 Crop Transition	X acres of crop X that transition to crop Y	Tier II
Field Equipment	AG-2 Reduce fossil fuel consumption in field equipment	A-2.1 Tractor operation efficiency	X% of farm equipment increases fuel efficiency X% through improvements to equipment, operation, and maintenance	Tier I
		A-2.2 Biofuel or low-carbon fuel conversion	X% of farm equipment switches to biofuels and X% of farm equipment switches to low carbon fuels	Tier II
		A-2.3 Conservation tillage (reduced fuel consumption)	X acres of overall farmland converted to conservation tillage	Tier II
Livestock	AG-3 Reduce livestock methane emissions	A-3.1 Reduced-food-intake cattle breeds	X% of cattle transition to reduced-feed-intake genetic stock	Tier II
		A-3.2 Reduced-food-intake sheep breeds	X% of sheep transition to reduced-feed-intake genetic stock	Tier II
		A-3.3 Diet modification (lambs)	X% of lambs with modified dietary intake (lipid and protein supplements)	Tier II
		A-3.4 Confined livestock manure management	X number of confined dairy cows with manure management system that reduces methane generation by X%	Tier II
		A-3.5 Concentrated horse manure management	X number of horses with concentrated manure management that transition to alternative practices which reduce methane production by X%	Tier II
Pesticide Application	AG-4 Reduce high GWP pesticide emissions	A-4.2 Methyl bromide application reduction	100% reduction in methyl bromide application	Tier II
Rice Cultivation	AG-5 Reduce rice cultivation-related methane emissions	A-5.1 Intermittent irrigation	X acres of rice to implement intermittent irrigation	Tier I
		A-5.2 Mid-season drainage/drying	X acres of rice to implement mid-season drainage/drying	Tier I
		A-5.3 Rice straw compost	X acres of rice to compost rice straw and reapply to fields	Tier II
		A-5.4 Early rice straw incorporation	X acres of rice to incorporate rice straw early after harvest	Tier II
		A-5.5 Rice straw export	X acres of rice to export straw to fiber product manufacturing, biomass energy, etc	Tier II
		A-5.6 Low-methane rice cultivars	X acres of rice planted in new low methane rice cultivars with less root exudate	Tier II
Residue Burning	AG-6 Reduce crop residue burning	A-6.1 Orchard residue chipping	X tons of orchard residue chipped and used as a soil amendment	Tier I
		A-6.2 Rice straw export	X tons of rice straw exported to fiber product manufacturing (no credit for biomass energy)	Tier II
		A-6.3 Rice straw compost	X tons of rice straw composted and reapplied to fields	Tier II
		*A-6.4 Crop-residue-to-energy ****	**** no direct emissions reduction benefit within sector, but source of renewable energy that could offset energy sector emissions*	See Energy
Liming	NA	No reduction measures proposed for liming subsector		NA
Carbon Sequestration (not in inventory)	AG-7 Sequester carbon in agricultural systems	A-7.1 Hedgerows	X miles of hedgerow established	Tier II
		A-7.2 Permanent Crops (orchards, etc)	X trees of species X planted	Tier II
		A-7.3 Rangeland afforestation (where appropriate)	X acres of rangeland converted to oak woodland, or alternatively X trees of species X planted	Tier I
		A-7.4 Riparian forest restoration	X acres of riparian forest restored	Tier I
Local Produce (not in inventory)	AG-8 Increase consumption of local agricultural products	A-8.1 Local product marketing	X% of residents and businesses food products sourced from Yolo County farms and ranches	Tier II
		A-8.2 Farmers markets	X number of new farmers markets established in Yolo County	Tier II

ATTACHMENT 3

Energy Sector

Inventory	Reductions			Rating
Subsector	Measure	Mechanism	Performance Indicator	Tier
Residential Electricity; Commercial Electricity; Industrial Electricity	E-1 Pursue a community choice aggregation program	EN-1.1 Increase in renewable energy portfolio	X% of electricity portfolio from renewable or clean energy sources	Tier I
Residential Electricity; Res. Natural Gas	E-2 Reduce energy consumption in existing residential buildings	EN-2.1 Energy efficiency building envelope retrofits	X% of existing residential buildings completing energy efficiency retrofits	Tier I
		EN-2.2 Energy efficient lighting and appliance retrofits	X% of existing residential buildings installing high efficiency lighting and appliances	Tier I
		EN-2.3 Smart grid technology integration	X% of existing residential buildings installing smart grid systems and appliances	
Residential Electricity; Res.l Natural Gas	E-3 Reduce energy consumption in new residential buildings	EN-3.1 Minimum performance standards for new construction	100% of new residential units performing at X% energy efficiency improvement above Title 24 standards (CGBC Tier I = 15%; CGBC Tier II = 30%)	Tier I
		EN-3.2 Exemplary energy performance in new construction	X% of new residential units voluntarily performing at X% level of energy efficiency above Title-24 energy code requirements X% of new residential units with no net energy consumption and/or carbon emissions	Tier II
		EN-3.3 Passive energy lot layout, building, and landscaping strategies	100% of new residential units employing passive energy site design practices	Tier II
		EN-3.4 Heat island mitigation strategies	X% of new residential units to employ urban heat island reduction strategies, reducing cooling load energy use by X%	Tier II
		EN-3.5 Energy efficiency appliances and equipment	100% of new residential units achieving X% reduction in energy consumption through Energy Star appliances	Tier I
		EN-3.6 Energy efficient exterior lighting and lighting equipment	100% of new residential units achieving X% reduction in energy consumption	Tier II
Commercial Electricity; Com. Natural Gas	E-4 Reduce energy consumption in existing commercial buildings	EN-4.1 Energy efficiency building envelope retrofits	X% of existing commercial buildings completing energy efficiency retrofits, improving efficiency by X%	Tier I
		EN-4.2 Energy efficient lighting and appliance retrofits	X% of existing commercial buildings installing high efficiency lighting and appliances, improving efficiency by X%	Tier I
		EN-4.3 Smart grid technology integration	X% of existing commercial buildings installing smart grid systems and appliances, reducing consumption by X%	Tier II
		EN-4.4 Agricultural building energy efficient lighting	100% of new agricultural buildings using energy efficient lighting, improving efficiency by X%	Tier III
Commercial Electricity; Com. Natural Gas	E-5 Reduce energy consumption in new commercial buildings	EN-5.1 Performance standards for new construction	100% of new commercial buildings performing at X% energy efficiency improvement above Title 24 standards	Tier I
		EN-5.2 Exemplary energy performance in new construction	X% of new commercial buildings voluntarily performing at X% level of energy efficiency above Title-24 energy code requirements	Tier II
		EN-5.3 Passive energy building and landscaping strategies	100% of new commercial buildings with X% reduction in energy consumption	Tier II
		EN-5.4 Heat island mitigation strategies	X% of new commercial buildings employ heat island reduction strategies, reducing cooling load energy use by X%	Tier II
		EN-5.5 Energy efficient appliances and equipment	100% of new commercial buildings achieving X% reduction in energy consumption through Energy Star appliances	Tier I
		EN-5.6 Energy efficient exterior lighting and lighting equipment.	100% of new commercial buildings achieving X% reduction in energy consumption	Tier II
Residential Electricity; Res. Natural Gas	E-6 District energy	EN-6.1 District energy systems in higher density mixed use specific plan development	X% of new construction in Specific Plan areas Y and Z accessing district energy, achieving X% energy efficiency improvement	Tier I
Industrial Electricity; Industrial Natural Gas	E-7 Industrial process energy efficiency	EN-7.1 Process load energy efficiency retrofits	X% of existing industrial operation improving process load efficiency by X% New industrial operations improve process load efficiency by X% above	Tier III
Residential Electricity; Res. Natural Gas Commercial Electricity; Com. Natural Gas	E-8 Renewable energy	EN-8.1 Solar hot water heaters	X% of new and existing residential units installing solar hot water heaters, reducing conventional energy demand by X% X% of new and existing commercial buildings installing solar hot water heaters, reducing conventional energy demand by X%	Tier I
		EN-8.2 Photovoltaic systems	X% of new residential units install, on average, X-MW of solar PV panels, reducing conventional energy demand by X%; X square feet of total commercial rooftop space is used to install solar PV, avoiding X MWh of consumption	Tier I
		EN-8.3 On-farm renewable energy facilities (i.e. walnut hulls-to-energy)	X MW of renewable energy generation capacity is installed in agricultural facilities	Tier II
		EN-8.4 Landfill gas-to-energy facility	X MW of renewable energy generation capacity installed at the landfill gas-to-energy facility, avoiding X MWh of consumption	Tier I
Embodied Energy (Not in inventory)	E-9 Reduce embodied energy within construction materials	EN-9.1 Low-embodied energy construction materials	100% of new construction achieves X% reduction in embodied energy (carbon content) of building materials	Tier III
		EN-9.2 Reuse existing buildings or previously developed areas	100% of new construction achieves X% reduction in embodied energy by reusing existing buildings or site layouts	Tier III
		EN-9.3 Recycled aggregate materials and products	100% of new construction achieves X% reduction in embodied energy by using recycled aggregate materials and products	Tier III
		EN-9.4 Low-embodied energy procurement materials	X% reduction in the embodied energy of County-procured materials	Tier III

Transportation Sector (includes Land Use)

Inventory	Reductions			Rating
Subsector	Measure	Mechanism	Performance Indicator	Tier
	* Transportation and land use measures will need to be calculated at community specific level.			
Transportation (No subsectors)	TL-1 Reduce vehicle trip emissions in new development	TL-1.1 Density (8	Combined to achieve 44 VMT generated per household per weekday	Tier I
		TL-1.2 Jobs/housing balance (1.2 jobs/housing unit)		
		TL-1.3 Land use mix		
		TL-1.4 Community centers (centeredness)		
		TL-1.5 Connectivity and design (600 ft max block length)		
		TL-1.6 Proximity to transit in new development		
Transportation (No subsectors)	TL-2 Reduce vehicle trip emissions in existing communities	TL-2.1 Density	Combined to achieve 44 VMT generated per household per weekday	Tier I
		TL-2.2 Jobs/housing balance (1.2 jobs/housing unit)		
		TL-2.3 Community Centers (centeredness)		
		TL-2.4 Farm Labor Housing	X% reduction in farm-based commute trip VMT from on-farm housing for workers/families	Tier II
Transportation (No subsectors)	TL-3 Increase bicycling mode share	TL-3.1 Bicycle infrastructure	6% bicycling mode share for new development (*Davis, Woodland, Winters average journey-to-work mode share*)	Tier II
		TL-3.2 Bicycle parking	X% bicycling mode share for existing communities	Tier II
Transportation (No subsectors)	TL-4 Increase walking mode share	TL-4.1 Walking infrastructure	4% Walking mode share for new development (*Davis, Woodland, Winters average journey-to-work mode share*) X% walking mode share for existing communities	Tier II
		TL-4.2 Traffic calming		Tier II
		TL-4.3 Safe-Routes-to-School program		Tier II
Transportation (No subsectors)	TL-5 Increase public transit mode share	TL-5.1 Local bus service	3% transit mode share for new development (*Davis, Woodland, Winters average journey-to-work mode share*) X% transit mode share for existing communities.	Tier I
		TL-5.2 Express bus service		Tier I
		TL-5.3 Bus stop amenities		Tier II
		TL-5.4 Bus route coverage		Tier II
		TL-5.5 Bus service frequency		Tier II
Transportation (No subsectors)	TL-6 Increase carpool mode share	TL-6.1 Enforced parking cashout	13% carpool mode share for new development (*Davis, Woodland, Winters average journey-to-work mode share*) X% carpool mode share for existing communities	Tier I
		TL-6.2 HOV priority		Tier I
		TL-6.3 Guaranteed ride home program		Tier I
		TL-6.4 Dynamic ridesharing		Tier II
		TL-6.5 Centrally located park and ride stations		Tier II
		TL-6.6 Preferential parking for carpools		Tier II
		TL-6.7 Flexible employee work schedules		Tier I
		TL-6.8 Tranportation management association		Tier II
Transportation (No subsectors)	TL-8 Reduce freight emissions	TL-8.1 Routing improvements	X% reduction in heavy truck VMT (heavy trucks represent about 10% of total VMT)	Tier III
		TL-8.2 Farm-to-market facilities	X% reduction in farm-to-market VMT	Tier III
Transportation (No subsectors)	TL-9 Alternative fuels	TL-9.1 Electric charging stations	X new electric charging stations installed in Yolo County; ⊠X new electric or hybrid/electric vehicles owned in Yolo County	Tier II
		TL-9.2 Biofuels	X gallons of biofuel purchased in Yolo County	Tier II
Transportation (No subsectors)	TL-10 Traffic Flow	TL-10.1 Roundabouts	X% reduction in traffic delay	Tier II
		TL-10.2 Fully-connected grid-based street pattern		Tier II
		TL-10.3 Traffic light synchronization		Tier II

Solid Waste Sector

Inventory	Reductions			Rating
Subsector	Measure	Mechanism	Performance Indicator	Tier
Solid Waste	SW-1 Reduce waste-related emissions	SW-1.1 Organic materials diversion	90% diversion of organic materials (i.e., food waste, yard waste, soiled paper)	Tier I
		SW-1.2 Construction and demolition waste diversion	75% diversion of construction and demolition waste	Tier II
		SW-1.3 Waste reduction and recycling	4.2 pounds per resident per day and 3.25 pounds per employee per day by 2020 (including organic wastes and C & D)	Tier I
Solid Waste	SW-2 Reduce landfill methane emissions	SW-2.1 Landfill methane capture	90% methane capture	Tier I
		SW-2.2 Landfill gas-to-energy	See Reduction Mechanism E-8.4	Tier I

Water Sector

Inventory	Reductions			Rating
Subsector	Measure	Mechanism	Performance Indicator	Tier
Water	WT-1 Reduce water consumption in existing buildings and landscapes	WA-1.1 Plumbing fixture/fixture fitting efficiency retrofits	20% improvement above the California Building Standards Code water efficiency standards in X% of existing buildings (mandatory + voluntary)	Tier ii
		WA-1.2 Water leak repair	Water leak repair in X% of existing buildings (mandatory + voluntary)	Tier II
		WA-1.3 Weather-based irrigation systems	Weather-based irrigation systems installed to service X% (or X acres) of existing landscapes	Tier II
		WA-1.4 Greywater / rain water collection systems	Greywater/rain water collection systems installed to service X% (or X acres) of existing landscapes	Tier II
		WA-1.5 Turf replacement	X% (or X acres) of existing landscapes converted to alternatives (i.e., xeriscape, low water plants)	Tier II
		WA-1.6 Consumer education	Education and outreach initiatives, resulting in X% water consumption reduction	Tier III
Water	WT-2 Reduce water consumption in new buildings and landscapes	WA-2.1 No net increase in water demand	100% offset of new project water demand	Tier II
		WA-2.2 Turf coverage maximum	25% maximum turf coverage in new development	Tier II
		WA-2.3 Greywater / rain water collection systems	Installation in 100% of new development	Tier II
Water	WT-3 Reduce agricultural water consumption and irrigation-related energy use	WA-3.1 Pump repair or upgrade	X% of pumps repaired and % of pumps upgraded to highest efficiency pump	Tier II
		WA-3.2 Solar irrigation pumps	X% of pumps switched to solar electric energy source	Tier II
		WA-3.3 Deficit irrigation	X acres of crop X converted from X irrigation technology to deficit irrigation	Tier II
		WA-3.4 Drip irrigation	X acres of crop X converted from X irrigation technology to drip irrigation (factor in additional energy in drip system)	Tier II
		WA-3.5 Alternate furrow irrigation	X acres of crop X converted from standard furrow irrigation to alternate furrow irrigation (factor in reduction in nitrous oxide emissions)	Tier II
		WA-3.6 Expand surface irrigation to additional acreage in County	X acres of X crop that currently use groundwater for irrigation to switch to surface water irrigation	Tier III
Wastewater	WT-4 Reduce stormwater generation	WA-4.1 New low impact development stormwater systems	No off-site treated stormwater from new projects	Tier II
		WA-4.2 Low impact development stormwater retrofits	X% reduction in treated stormwater in existing communities	Tier II
Wastewater	WT-5 Reduce wastewater treatment emissions	WA-5.1 Wastewater methane capture	X% methane capture	Tier I
		WA-5.2 Wastewater gas-to-energy	X MWh of generation capacity, avoiding conventional energy consumption	Tier I

Adaptation "Sector"

Sub Category	Measure	Mechanism	Performance Indicator	Tier
Adaptation - General	AD-1 Develop anticipatory governance strategies capable of ensuring that Yolo County remains resilient to climate change	AD-1.1 Develop program to communicate state-of-the-art climate adaptation science to the Yolo County community and officials for anticipatory planning purposes	NA	Tier IV
Adaptation - Agriculture	AD-2 Facilitate climate adaptation within Yolo County Agriculture	AD-2.1 Develop an Agricultural Climate Adaptation Plan that focuses on increasing the resiliency of Yolo agriculture to climate change	NA	Tier IV
		AD-2.2 Develop program to monitor climate change effects on and trends relevant to Yolo County agriculture and convey findings to community	NA	Tier IV
Adaptation - Water Resources	AD-3 Anticipate climate change effects on the County's water resources	AD-2.1 Develop program to monitor climate effects on water resources in Yolo County	NA	Tier IV
Adaptation - Sea Level Rise	AD-5 Respond to the potential threat of sea level rise	AD-2.1 Develop a Sea Level Rise Strategic Plan	NA	Tier IV
Adaptation - Wildfire	AD-6 Ensure wildfire management practices respond to changing climate	AD-2.1 Develop program to evaluate the potential increased threat of wildfire resulting from climate change and the adequacy of existing wildfire mitigation practices	NA	Tier IV
Adaptation - Public Health	AD-8 Protect public from climate change induced health risks	AD-2.1 Develop program to monitor and respond to climate change induced public health risks (e.g., heat-related illness and mortality, air quality-related diseases, and vector borne diseases)	NA	Tier IV