Placer County
California

Strategic Plan for the Wildfire Protection and Biomass Utilization Program

October 2007

TABLE OF CONTENTS

Office of The Board of Supervisors

Honorable Chairman of the Placer County Board of Supervisors

Supervisor Bruce Kranz, District 5

Honorable Members of the Placer County Board of Supervisors

Supervisor F.C. Rocky Rockholm, District 1

Supervisor Robert Weygandt, District 2

Supervisor Jim Holmes, District 3

Supervisor Kirk Uhler, District 4

OFFICE OF THE
COUNTY EXECUTIVE OFFICE
COUNTY OF PLACER

Thomas Miller, County Executive Officer
Rich Colwell, Chief Assistant County Executive Officer
Holly Heinzen, Assistant County Executive Officer
Mike Boyle, Assistant County Executive Officer

Wildfire Protection & Biomass Policy Team

Bruce Kranz, Placer County Supervisor District 5

Jim Holmes, Placer County Supervisor District 3

Holly Heinzen, Assistant CEO Placer County

Dr. Richard Burton, Placer County Health Officer

Brett Storey, Biomass Program Manager PC CEO Office

Rui Cunha, Director PC Office of Emergency Services

Tom Christofk, Placer County Air Pollution Control District Officer

Jim Durfee, PC Facilities Services Director

Mary Herdegen, PC CEO Office

George Alves, PC Fire Mitigation Coordinator

Tad Mason, PC Forestry Consultant

Pete Evich, PC Federal legislative advocate

Brian Lungren, PC State legislative advocate

VISION

The Placer County vision for our future is:

In order to better the County and its lands; by protecting its citizens, their property, and our environment; and to assure the future ability to maintain an enjoyable quality of life; we will embark on a path to reduce the threat of a catastrophic wildfire, while deriving the most optimum method of converting unwanted woody biomass into a beneficial commodity. To accomplish this vision, the Wildfire Protection and Biomass Utilization Program was developed in Placer County (County). The goal of the Program is to promote projects that will diminish the threat of catastrophic wildfires, improve public health and safety, reduce pollution, and enhance our environment. In addition, Placer County will advance environmentally-sound economic opportunities for the utilization of the County's renewable biomass resources to produce heat and/or electrical power, alternative transportation fuels, or beneficial bio-based chemicals and products.

It is the intent of Placer County to advance this vision in terms understandable to all citizens, such that they understand that the County intends to protect its communities and the natural environment in conjunction with promoting forest health in practical ways. It is our hope that this mission will gain acceptance from all groups and individuals living, working, and caring about Placer County.

EXECUTIVE SUMMARY

Many of the forests in Placer County have an unnatural excess accumulation of woody biomass due to decades of fire suppression activities. In addition to contributing to poor forest health, excess biomass greatly increases the risk of catastrophic wildfire. To address this issue, Placer County established the Wildfire Protection and Biomass Utilization Program (hereafter referred to as "Program"). The main goals of the Program are to:

- Reduce the risk of catastrophic wildfires in Placer County.
- Protect Placer County citizens and visitors from the consequences of catastrophic wildfires.
- Find one or more beneficial uses for excess biomass in Placer County.
- Improve air quality in Placer County.

In recent years, technological advancements and incentives to use renewable resources for energy generation have enabled biomass-powered energy facilities to become established. Currently, establishment of one or more economically sustainable facility that converts biomass into power, fuel, or another valued commodity appears to be the County's best option for managing excess biomass and reducing the severity of wildfires. However, there are several constraints to establishing a biomass facility. These constraints include the ability to reliably procure and transport biomass feedstock; the

ability to establish requisite infrastructure; the ability to obtain air quality permitting of the facility; and the ability to attract private investors (among other constraints).

The County has identified several key actions that will help it in meeting Program objectives. These include educating public citizens; developing strategic alliances with public and private partners; conducting coordinated and transparent planning; and obtaining grant funding. To accomplish wildfire safety objectives, the County will continue to implement established programs (e.g., Chipper Program) while implementing several new programs (e.g., Biomass Box Program). To accomplish biomass utilization objectives, the County will coordinate or conduct technical studies designed to determine if it is feasible to establish a biomass facility in the County, and it will solicit interest and assistance from public and private stakeholders. This Strategic Plan provides the path for Placer County to effectively protect its communities from the threat of catastrophic wildfire, and to efficiently manage biomass resources that are a large component of that threat. If Program goals are met, Placer County will be a safer, healthier, and more enjoyable place for all.

INTRODUCTION

In July of 2006 the State of California issued its "Bioenergy Action Plan", which describes State-level challenges and goals for enhanced biomass resource utilization. Strategies for reaching goals outlined in the Bioenergy Action Plan are being developed concurrent with the federal governments "Biomass Research and Development Initiative". Both the Bioenergy Action Plan and the Biomass Research and Development Initiative were developed in response to President Bush's "Biofuels Initiative", an on-going directive designed to facilitate national management of biomass resources. With Governor Schwarzenegger's release of the Bioenergy Action Plan and the associated Roadmap for Development of Biomass Resources, California municipalities now have a clear path for the coordination and implementation of biomass research and development activities (CEC 2006)

Program History

The Placer County Board of Supervisors (BOS) recently embarked on a path to combat the threat of catastrophic wildfire and protect its citizens from the devastating effects such a wildfire would have. In May 2005, the BOS formally allocated an increase in funds for wildfire hazard mitigation and other fire safety activities. Then in April 2006, the BOS authorized the CEO to hire a Biomass Manager to examine options for reducing the abundance of flammable woody biomass in the County. Specifically, the Biomass Manager would oversee and coordinate Placer County's efforts to: (1) determine the feasibility of removing woody biomass from forest lands in the County; and (2) examine the options for using excess biomass to generate economically-sustainable forms of energy or other beneficial products. To ensure these efforts have a positive effect on County wildlands and citizens, the BOS has outlined several specific tasks that it would like accomplished. Through participation in the Biomass Technical Committee and the Wildfire Protection & Biomass Policy Advisory group; the Biomass

Manager, other pertinent County staff, several state and federal agency personnel, and various private consultants are working in support of the BOS' stated direction, and several fire protection and biomass related activities have already been accomplished.

Placer County's proactive approach in addressing biomass management has provided the County with the unique opportunity to lead the state by being the first County to implement elements of the Bioenergy Action Plan. It also provides the County with the opportunity to develop partnerships and capitalize on state and federal funding for biomass programs. This Strategic Plan provides direction for Placer County to address biomass removal and utilization; coordinate with state and federal programs; develop strategic partnerships; and effectively and efficiently protect Placer County communities from catastrophic wildfire.

Over the past seven years Placer County has invested over two million dollars into fire prevention activities. These activities have included building fuel breaks, developing programs to inform citizens on how to prevent fires, implementing wood chipper programs, building community support through Fire Safe Councils, establishing defensible space areas, and providing for forest health programs. In addition, the County and State fire organizations have spent millions of dollars to prevent wildfires in Placer County.

Program Area

Placer County, California is located east of Sacramento between Nevada County (to the north) and El Dorado County (to the south). The County stretches from the edge of the Central Valley, east through the foothills and Sierra Nevada to Lake Tahoe and the Nevada border (Figure 1). Approximately half of the County's 969,600 acres are forested. This includes considerable portions of the Tahoe National Forest and Lake Tahoe Basin Management Unit.

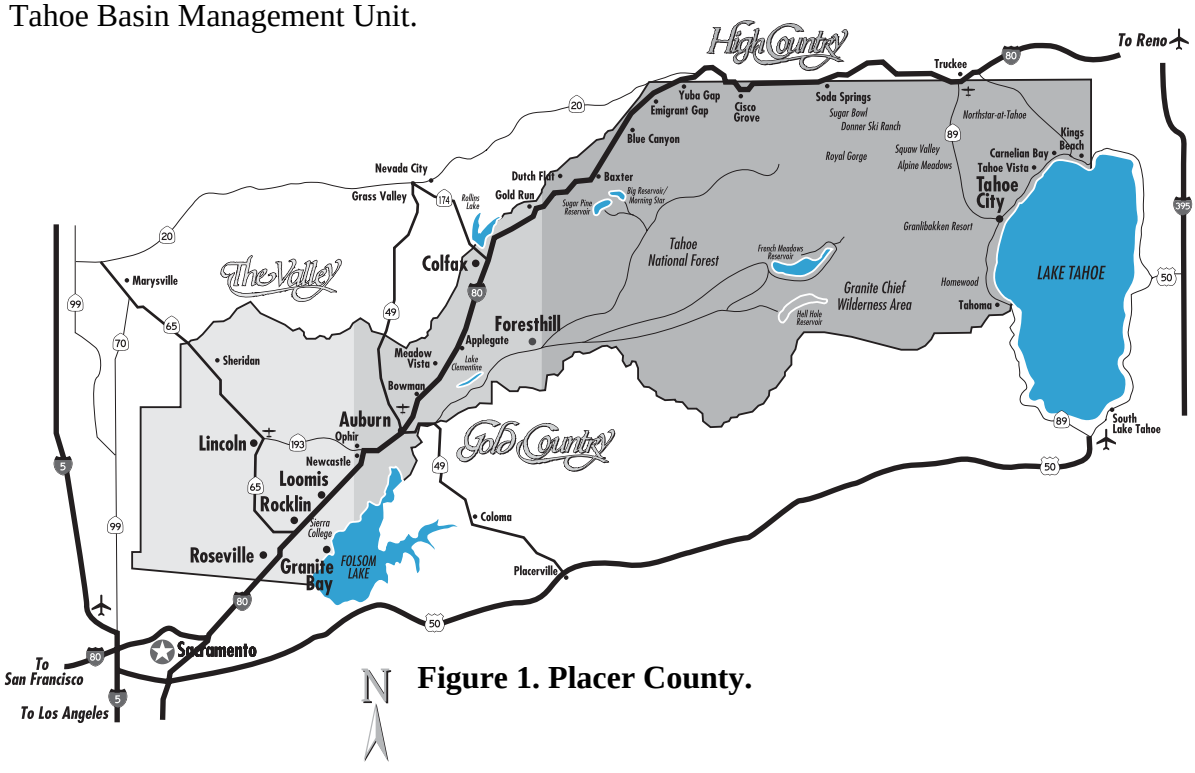

Figure 1. Placer County.

Placer County has experienced a relatively rapid population growth during the last several decades. According to U.S. Census Bureau data, the County's population grew from 172,796 people in 1990 to 248,399 in 2000. This represents a 43.75% increase; only San Benito County experienced more rapid growth in the state. In 2006, the U.S. Census Bureau estimated the County's population had grown an additional 31% since the year 2000 (approximately 324,000 residents). Much of the County's recent growth has been in communities along the wildland-urban interface ("WUI") in both forested and oak woodland environments.

To help protect people and their property from potentially catastrophic wildfires, the National Fire Plan (as drafted by federal agencies in 2000) directs funding to be provided for projects designed to reduce the fire risks to communities. A fundamental step in achieving this goal was the identification of communities that are at high risk of damage from wildfire. Thirty-nine of the 1,264 communities currently categorized as at-risk are located in Placer County. Some of these communities have already been affected by wildfire. Since 2001, four major fires have occurred in Placer County (i.e., the Gap, Ponderosa, Star, and Ralston fires) (Figure 2). These fires consumed over 30,000 acres of forest, cost millions of dollars to fight, and resulted in injuries to dozens of firefighters.

Figure 2. Ralston Fire that burned just outside Foresthill in the American River Canyon in September 2006.

Sixty percent of Lake Tahoe's west shore is located within the County. Population growth in the Lake Tahoe Basin (Basin) has been modest compared to other regions of the County; however, the overall population of the Basin at any given time is highly linked to the number of visitors. Lake Tahoe is a national and international tourist destination, and the Basin's economy is significantly dependent on the resort, recreational, and gaming industries. In addition to its economic importance, the Basin provides numerous other benefits including water supply, terrestrial and aquatic habitat, and aesthetic enjoyment. Due to its famed clarity and unique features, Lake Tahoe was designated an *Outstanding National Resource Water*. This designation provides the lake with an additional level of protection under the federal Clean Water Act.

Fire History and Biomass Abundance in California

Prior to the 20th century fire was a common occurrence in the Sierra Nevada. Pre-settlement fire return intervals were generally less than 20 years throughout a broad zone that extended from the foothills through the mixed conifer forests. Frequent fire promoted woodlands and forests that were generally open and dominated by large fire-resistant trees species. In the early 20th century the U.S. Forest Service enacted a nationwide policy of fire suppression. Fire suppression efforts were extremely successful in reducing both the frequency and extent of wildfires. Over a century of fire suppression in conjunction with logging of many large trees has resulted in forests that are generally younger, denser, more homogeneous, and have smaller diameter trees. The lack of fire has almost certainly resulted in substantial increases in the amount of biomass present in forests, as well as the vertical distribution of that biomass. In contrast to pre-settlement conditions, many Western forests now have a large amount of both live and dead fuel near the forest floor. This fuel provides a fuel ladder between surface fuels and the forest canopy, often enabling active "crown" fires (fires that spread quickly as they move through the canopy of a forest) As a consequence; current wildland fires typically burn considerably larger contiguous areas, burn at higher intensities, and are more likely to significantly alter the landscape (McKelvey and others 1996). These types of fires are commonly referred to as "catastrophic wildfires".

In contrast to the low-intensity ground fires that were typical of pre-settlement forests, modern day wildfires often result in severe consequences to both the natural and human environment. Certainly the most significant of these consequences are the injuries and loss of life that periodically occur when firefighters or public citizens are overcome by a wildfire. Other consequences of modern day wildfires include the loss of homes, businesses, and other infrastructure. Economically, wildfires are extremely expensive to suppress. Since 2000, the cost incurred by the US Forest Service alone has averaged over $1 billion annually (NIFC nd). Although the human consequence of catastrophic wildfires is widely known, the ecological consequences are often less so. Catastrophic wildfires may destroy habitat essential to sensitive wildlife species, permanently alter vegetation communities, destabilize soils, degrade water quality, and adversely affect air quality (with subsequent adverse effects on human health).

Fire Management Strategies

Suppression

In 1970 the U.S. Forest Service acknowledged the ecological importance of fire in maintaining healthy ecosystems, and in 1978 the agency officially abandoned its policy that required all fires to be extinguished as quickly as possible (Berry 2007). Nonetheless, fire suppression remains a prominent strategy in both the State's and Federal Government's management of wildlands. In 2005, the US Forest Service estimated that less than 1% of wildfires on federal lands were allowed to burn.

Suppression is an expensive passive strategy to addressing the consequences of catastrophic wildfires. Recent studies have indicated the value of supplemental management strategies in reducing fire suppression costs and many of the other detrimental consequences of wildfire. These include creation of defensible space and installation of fuel breaks; biomass treatment activities through use of prescribed fire; restoration cutting; or other means of fuels treatment.

Defensible Space

Defensible space is defined as:

> *An area either natural or manmade where material capable of causing a fire to spread unchecked has been treated, cleared, reduced or changed in order to act as barrier between the advancing wildfire and the loss to life, property or resources* (Cal Fire 2007).

Through Public Resource Code (PRC) §4291, Placer County and the State of California currently require 100 feet of defensible space around structures located in rural portions of the County. To improve compliance of the requirement, the County conducts inspections of defensible space and provides educational information to landowners. For those landowners seeking it, assistance with meeting defensible space requirements is provided by the Placer County Fire Safe Alliance and the various fire safe councils within the County.

The creation of defensible space is perhaps the single most effective means of protecting structures and assisting firefighting efforts. However, defensible space is only effective if it is implemented and maintained. Even the presence of defensible space does not ensure the protection of a structure or its residents. The Angora Fire that recently occurred (in June 2007) in the Lake Tahoe Basin burned more than 250 structures. Although many of these structures had defensible space, they ultimately burned because Stream Environment Zones had enough fuels to produce airborne firebrands that landed on wooden roofs or other flammable surfaces.

Fuel Breaks

A fuel break is defined as:

> *A strip or block of land on which the vegetation, debris and detritus have been reduced and/or modified to control or diminish the risk of the spread of fire crossing the strip or block of land* (NRCS 2005).

Numerous fuel breaks are located in the County. These fuel breaks are regularly maintained by the County and the U.S. Forest Service.

Although fuel breaks assist firefighters in suppression efforts, they do not ensure a wildfire will be contained. Wildfires often "jump" fuel breaks, particularly under adverse weather conditions (e.g., strong winds). In addition, fuel breaks are only effective if they are adequately maintained. Fuel break maintenance can be expensive and it may be limited if sensitive environmental resource issues occur (e.g., presence of sensitive plant or animal species).

To assist in the prevention of catastrophic wildfires, Placer County intends to develop and maintain more fuel breaks.

Prescribed Fire

Prescribed fire is defined as:

> *Fire applied in a knowledgeable manner to forest fuels on a specific land area under selected weather conditions to accomplish predetermined, well-defined management objectives* (GFC 2007).

Typically the objective of prescribed fire is to reduce the abundance of biomass and understory vegetation. Under the right conditions, prescribed fire provides the added ecological benefit of mimicking a naturally-occurring low-intensity ground fire. A limited amount of prescribed burning currently occurs in the County and will continue as a "tool" used by professional fire organizations.

Several constraints prohibit the use of prescribed fire as the sole management tool in reducing the hazard of a catastrophic fire in Placer County. Currently, the amount and timing of prescribed fires in the County can be constrained by air quality regulations and meteorological conditions. Previous incidents (e.g., Cerro Grande Fire, Lowden Ranch Fire) have caused the use of prescribed fire to have significant liability due to the potential for escape as a result of unanticipated weather events (e.g., high winds, low humidity). In addition, prescribed burning is typically expensive and requires many resources (e.g., firefighters, equipment). Finally, the use of prescribed fire is limited to certain landscapes (e.g., those with gentle slopes and firefighter access) and it may not be possible in areas adjacent to human habitation.

Restoration Cutting

Restoration cutting is a term applied to mechanical cutting that attempts to mimic the effects of historic fire or other ecosystem processes. In contrast to most thinning or commercial timber harvest operations, restoration cutting typically involves removal of both small and large diameter trees in numbers similar to those that would be killed in a historic fire event (i.e., several small and a few large trees). Restoration cutting can be an effective management tool, especially in locations where use of prescribed fire is not possible, or when timber revenues can assist in offsetting the costs of treatment. Unfortunately, restoration cutting can be expensive to prepare and implement, especially if there is not a market for trees being cut (e.g., small-diameter trees).

Biomass Utilization

By the 1970s, organic chemicals derived from petroleum were present in more than 95% of the markets previously held by products made from biological resources (Morris and Ahmed 1992). However, recent technological developments and an interest in using renewable resources have created opportunities to address industrial and societal needs through the production and processing of biological materials. Current uses for biomass or other biological materials include heat and electrical power, commodity and specialty chemicals, fuels, and materials (among other uses).

Electrical Power Generation

Biomass power plants, using thermal oxidation created by a boiler system, were first conceived and constructed during the 1940's in Springfield, Oregon. The purpose of the initial (30 MW) plant was to divert sawmill waste into a controlled efficient oxidation process that would significantly reduce air pollution in the Willamette Valley. Currently, power from biomass is a proven commercial electricity generation option in the United States, and it is a significant source of renewable electricity (currently more than 10,000 megawatts of electricity produced). More than 200 companies outside the wood products and food industries generate biomass power in the United States. Where power producers have access to very low cost biomass supplies, the choice to use biomass in the fuel mix enhances their competitiveness in the marketplace. This is particularly true for power companies choosing to save fuel costs and earn emissions credits. In addition, an increasing number of power marketers and utilities are starting to offer "environmentally friendly" electricity (including electricity from biomass power) in response to consumer demand and regulatory requirements. Typically usable heat is also produced during the electricity generation process. This heat can be applied to co-located uses, which garnish additional economic benefits and enable the technology to be more economically viable.

Transportation Fuels Development

Ethanol, methanol, alcohol-based fuels, or hydrogen derived from woody biomass could potentially provide more than one-third of the current liquid transportation fuels demand

of the United States. As emerging biomass to liquid fuels technology and manufacturing processes are commercialized, significantly more biomass feedstock markets will be needed to supply the raw material needed by the "bio-refineries" of the future.

The molecular components of woody forest biomass (i.e., cellulose, hemicellulose, and lignin) obtained by hazardous fuels reduction offer a valuable future resource opportunity. In addition, forest biomass produced on a sustainable basis offers a renewable transportation fuel feedstock derived from a raw material that has non-competing values and in many cases is considered a waste byproduct.

Other Bio-based Opportunities

In addition to the current technology capable of using woody forest biomass to produce electrical power and heat, there are emerging technologies for the conversion of woody biomass into a wide variety of chemical products, or substances that serve as building blocks for various chemicals and products (Figure 3). These conversion technologies may hold additional, and significant, value for the utilization of woody biomass in Placer County.

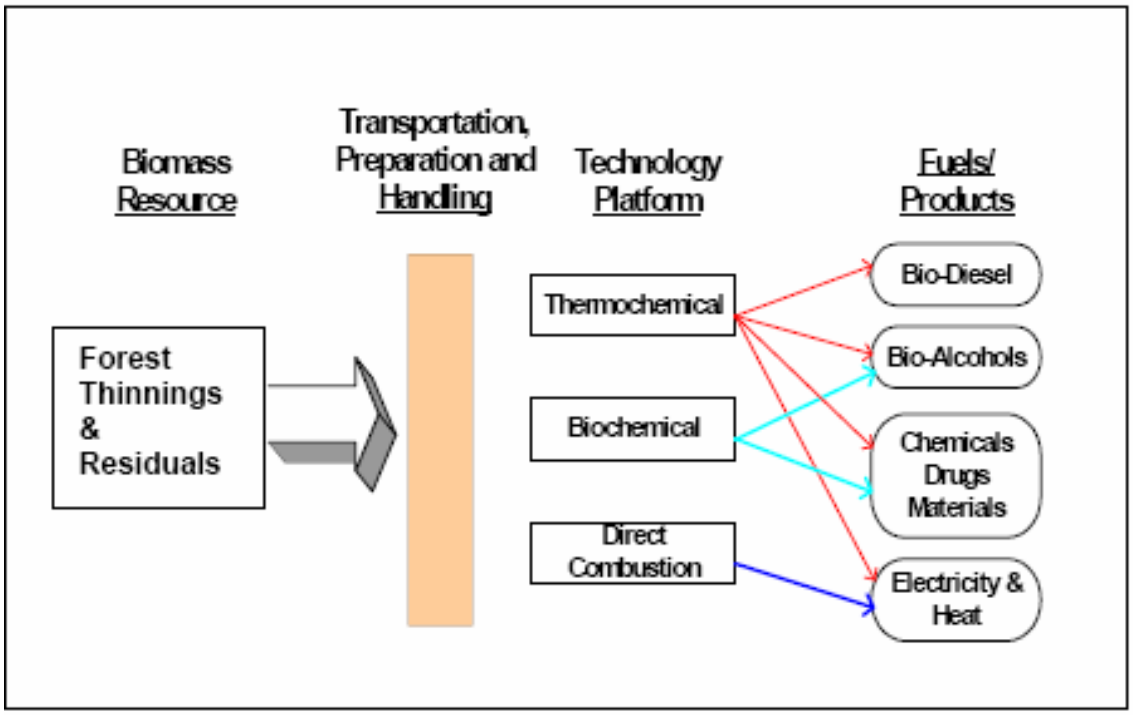

Figure 3. Existing and emerging biomass utilization technologies

GOALS

The goals of Placer County's Wildfire Protection and Biomass Utilization Program are to:

1. Reduce the risk of catastrophic wildfires in Placer County.
2. Protect Placer County citizens and visitors from the consequences of catastrophic wildfires.
3. Find one or more beneficial uses for excess biomass in Placer County.
4. Improve air quality in Placer County.

OBJECTIVES

In an attempt to achieve these goals, Placer County has generated several objectives for the Wildfire Protection and Biomass Utilization Program to accomplish. The primary objectives are to:

1. Determine the feasibility and options for removing excess woody biomass from lands within the County.
2. Determine the feasibility and options for transporting excess biomass from the source to a biomass processing and/or utilization facility.
3. Determine the feasibility and options for converting excess biomass into electrical power, alternative transportation fuels, or another commodity beneficial to the citizens of Placer County.
4. Identify and secure funding for Program activities.
5. Promote the Program.
6. Continue and expand management practices that protect Placer County from the adverse effects of wildfire.
7. Continue to seek and evaluate information on new strategies that will protect the County from the adverse effects of wildfire.
8. Examine the feasibility of the various alternatives for removing excess biomass from wildlands in Placer County.
9. Coordinate with resource agencies, other counties, fire protection organizations (e.g., Fire Safe Councils), utilities, consultants, and the public to improve the level of fire protection in the County.
10. Identify the various beneficial uses and markets for excess biomass in Placer County.
11. Determine the most beneficial use(s) for excess biomass in Placer County.
12. Market biomass utilization opportunities to private biomass business enterprises.

With the enactment of this Strategic Plan in 2007, Placer County will embark on a series of actions that will promote pertinent research; provide collaborative solutions; outline necessary annual programs; build lasting partnerships; plan focused technology demonstrations; develop infrastructure for appropriate facility development; and determine appropriate funding solutions to allow for advancements in wildfire safety, and the founding of an enduring renewable biomass utilization strategy for local forest biomass materials.

PROGRAM STRATEGIES

Wildfire Protection

This section provides the strategy for reaching the goal of protecting the County from the consequences of catastrophic wildfires. It contains a discussion on the wildfire safety programs that have already been implemented in the County, the intent of those programs, and additional programs we propose implementing.

Fuels Reduction

According to former U. S. Forest Service Chief Dale Bosworth, the national forests' greatest threats include hazardous accumulations of fuels due to the exclusion of fire, and the dangerous fires that could result from ignition of these fuels (Berry 2007). Similar threats exist on forests outside the national forest system, including on wildlands in Placer County. Recently, considerable effort has been devoted to mitigating these threats by reducing the abundance of hazardous fuels through either prescribed burning or mechanical removal of fuels.

Defensible Space

Increasing numbers of homes in Placer County are present along the wildland-urban interface (i.e., homes and structures bordering wildlands). Without proper mitigation, most of these homes and structures are at great risk of being damaged or destroyed by wildfire. In addition, homes and structures adjacent to wildlands (especially ones without proper wildfire mitigation) stress firefighting resources and raise fire suppression costs. Placer County currently has several programs designed to support individual homeowners and businesses in reducing fuels and establishing defensible space around their properties. These programs include the "Chipper" Program and the PRC §4291 Defensible Space Inspection Program.

For the most part, Placer County has relied on voluntary cooperation of private landowners to implement local hazardous fuel reduction measures. In all likelihood there will always be a certain amount of non-compliance. However, we believe there are residents that would like to comply, but simply are unable to. Placer County will develop a Fuel Load Reduction Assistance Program that provides free or discounted fuel load

reduction services to those in need (e.g., handicapped, low-income, seniors on fixed incomes) to ensure they are fire safe.

Placer County currently works with local fire professionals and their supporting Fire Safe Councils to assess impacts from development and to establish long-term fuel reduction and maintenance arrangements. Given the desire to promote fire prevention activities, Placer County will develop methods to recognize communities and individuals that demonstrate a superior commitment to fire prevention and fire safe activities.

Placer County will encourage the insurance industry and other relevant parties to develop incentives (e.g., credits or discounts) for their customers to make dwellings, communities, and landscapes safe from fire. Incentives would be similar to those homeowners currently receive for having smoke alarms, security systems, and other safety equipment.

County Projects

Numerous existing County projects are designed to remove biomass fuels from private land for the express purpose of protecting homes, businesses, and the community in general. The County also intends to build on the USFS' directive to promote healthy forests even beyond WUI areas and into accessible forested regions. The County has worked with organizations to develop and maintain fuel breaks and conduct defensible space inspections. In addition, the County is poised to begin managing open space and parks with a more aggressive hazardous fuels reduction program.

The County will continue to review and implement projects that promote fire prevention, and it will look to more directly encourage up-front activities, such as the mandatory installation of fuel breaks whenever new homes and businesses are developed in the WUI.

Biomass Box Program

County staff has already developed and implemented the operating methods and budget to place biomass boxes into our communities that require defensible space treatments. The idea is to promote defensible space by all business and homeowners during the spring and then to provide these "boxes" (Figure 4) to allow the public to have the material removed easily and at little or no cost. This program has already become a mainstay for the County, and it helps the County in its mission to protect its citizens and visitors from the consequences of catastrophic wildfires. It also provides an alternative to "open burning", thereby reducing the amount of air pollution.

Figure 4. Placer County Biomass box program

Agricultural Waste Removal/Mulch Program

County staff will define and develop the operating methods and budget to promote the mulching or removal of all agriculture waste products within Placer County. The idea is to promote non-burning by all business and homeowners following harvest season by either providing a means for the public to have the material removed easily and at little or no cost (likely as a part of our "biomass box" program), or by developing methods to promote the mulching of these materials. The County hopes that this program will also become a mainstay for the County and help in our mission of preventing as much "open burning" as possible.

Coordinated Planning

Community Wildfire Prevention Planning

Placer County supports community wildfire prevention through the Community Wildfire Prevention Plan (CWPP) process. Placer County's support for the CWPP process includes funding, assistance with projects, and assistance with grant preparation. A CWPP enables a community to plan how it will reduce the risk of wildfire. The plan identifies strategic sites and methods for fuel reduction projects across the landscape and jurisdictional boundaries. Benefits of having a CWPP include National Fire Plan funding

priority for projects identified in a CWPP. In addition, the U.S. Forest Service and the Bureau of Land Management (BLM) can expedite the implementation of fuel treatments identified in a CWPP through alternative environmental compliance options offered under the Healthy Forests Restoration Act.

Placer County Fire Safe Alliance

Placer County provides leadership and support for the Placer County Fire Safe Alliance (PCFSA). The primary function of the PCFSA is to reduce the likelihood of catastrophic wildfire in the County. It does so by supporting public education and community fuel reduction efforts; by providing professional fuels management expertise and guidance to fire agencies and councils; and by coordinating resources and fuel reduction efforts.

The PCFSA has an executive board consisting of representatives from the United States Forest Service, Bureau of Land Management, California Department of Forestry and Fire Protection, and Placer County Office of Emergency Services (OES). PCFSA members include fire professionals, fire safe councils, the Resource Conservation District, and watershed group representatives.

Workshops and Alliances

The County believes a stronger alliance with other parties involved in catastrophic wildfire prevention and fuel reduction efforts will be an asset to the Program. Alliances enable sharing of knowledge, coordination of activities, and provide additional credibility to program activities. The County will participate in workshops for, and with, targeted stakeholders to discuss plans and objectives, and to solicit their interest and participation. These workshops will emphasize how local initiatives align with statewide and national goals and objectives, how participating stakeholders would benefit from an alliance with the County, and what each alliance member's role would be. In particular, we would like to explore opportunities for an alliance with the PCFSA, augmented by members from the Placer County Water Agency, the PCAPCD, Union Pacific, Pacific Gas and Electric, Sierra Pacific Industries, Sierra Pacific Power, and other public and private sector entities contributing to the fuel reduction efforts ongoing in Placer County. To build and maintain interest and momentum, Placer County plans to hold workshops early in Program development.

Fire Code

Placer County has adopted the Uniform Fire Code and has incorporated more rigid standards when deemed appropriate. The current fire code is contained in Chapter 15.04.040 of the Placer County Code. Placer County currently conducts assessments and makes recommendations for more stringent fire code standards in coordination with the various fire organizations in Placer County, the Placer County Fire Safe Alliance, and Placer County staff. Recommendations are presented to the BOS for consideration and approval.

Defensible Space Code

The Placer County Hazardous Vegetation Abatement Ordinance is being developed to provide guidance for the abatement of hazardous vegetation on unimproved parcels. This ordinance will apply to any unimproved parcel adjacent to an improved parcel, where the owner/occupant of the improved parcel is unable to obtain the required defensible space clearances, as per adopted County Codes and/or PRC 4291. The owner of the unimproved parcel shall provide the fuel modifications to meet the defensible space requirements of the improved parcel. The Placer County BOS supports the improved parcel defensible space obligations found in PRC 4291. This ordinance will augment State law to ensure defensible space activities are accomplished along roadways, fire access easements, and unimproved parcels adjacent to improved parcels; and so that land owners can benefit from the intent of PRC 4291. This pilot ordinance shall take effect thirty days after its adoption for the areas defined as the North Tahoe Fire Protection District, Alpine Spring County Water District, Squaw Valley Public Service District, and Northstar Community Services District. The ordinance will remain in effect for one year.

Establishing Healthy Forests

The relationship between healthy forests and catastrophic wildfire prevention has been well established. Placer County will work with various agencies to understand and promote land management practices that provide for a healthy forest ecosystem. To do this, Placer County will:

- Continue to establish arrangements for sustainable fuel reduction efforts around new development along the WUI.
- Support State and federal legislation and programs that fund fuel reduction efforts and promote responsible forest management practices.
- Implement, coordinate, and facilitate individual land owner fuel reduction efforts.
- Continue to implement, coordinate, and facilitate community fire safety efforts by establishing fuel breaks along access routes, at strategic sites on ridges, or in areas highly susceptible to fire (e.g., along railways and major highways).
- Capture and utilize biomass material generated through the Defensible Space Program.
- Advocate the creation and maintenance of strategic fuel modification zones throughout the County.
- Assist private tree farms in locating viable markets for their timber and biomass resources.
- Advocate both public and private sustained yield forest management plans.

Effectiveness of Treatment Activities

Until relatively recently, there was very little information on the effectiveness of treatment activities in controlling fire severity and behavior. Within the past few

decades, shifts in forest management practices and a dramatic increase in treatment activities have generated numerous studies on wildland fire ecology. Studies have concluded that not only are treatments effective in controlling and reducing fire activity, but that significant savings in total fire costs to citizens can be realized. In a modeling study conducted by UC Berkeley, researchers concluded that a combined strategy of suppression, mechanical mastication, thinning from below, and prescribed fire would significantly alter fire behavior, fire intensity, and tree mortality (Stephens and Moghaddas 2005).

Locally, forest treatment activities have proved effective in assisting suppression, lowering fire intensity, and modifying fire behavior. In the year 2000, the Goat Fire (Lassen County) entered an area that had previously had fuel treatments. As the fire entered the treatment area, it dropped back to the ground (from the canopy), resulting in a lower fire intensity, thus providing an opportunity for firefighters to control the burn (Figure 5). The treatment area was attributed with helping contain the fire before it reached the nearby community of Lake Forest Estates. In the 2006 Ralston Fire, shaded fuel breaks around the community of Foresthill enabled firefighters to concentrate on other critical areas and protect the community.

Figure 5. Result of treatment activities on the intensity of the Goat Fire. Island of trees in center of picture had previously received fuels treatment and survived the fire.

In 2006, the Western Governor's Association concluded: *The cost of treating fuels on an acre of forested land is usually much less than the cost of active fire suppression on the same acre under wildfire conditions.*

The cost for the recent Ralston Fire (2006) that occurred in Placer County was estimated to be around $13 million, and fortunately there were no losses of life or structures. It is clear that it is in the best interest of Placer County to avoid the economic, societal, and environmental costs resulting from a catastrophic wildfire (Figure 6).

As the County examines what it can do to ensure safety from catastrophic wildfire, the results of forest treatments seem to have both tangible and financial benefits. With over half of all of Placer County covered by forest, the County needs to ensure that treatment activities continue and increase. The County intends to develop programs that can support as many treatment options as practical.

Figure 6. Results of the Ralston Fire. In many areas the fire devastated the forest and wildlife habitat, severely impacted air quality, and caused significant erosion.

Biomass Utilization

There are three main components to the biomass utilization aspect of the Program. These are:

1. Determining the feasibility of, and options for, removing excess biomass in Placer County;
2. Determining the feasibility of, and options for, transporting and storing treated biomass from unwanted locations to desired facilities; and,
3. Determining the feasibility of, and options for, processing biomass into a valuable commodity.

The subsequent section of this document includes a discussion of each component, including the variables that will be addressed and the processes we propose to implement. We conclude by discussing strategies and requirements common to all three components. Although we discuss each component separately, they are highly interrelated, and work on each component will be conducted concurrently. For example, the Program will be heavily influenced by the County's ability to attract one or more biomass utilization business to the area. However, attracting biomass businesses to the area is highly dependent on the County's ability to facilitate a reliable and economical supply of biomass feedstock. Because results of any given study will likely influence the scope of future studies, we are unable to provide a step-by-step process that will be followed to achieve results. However, to efficiently analyze the feasibility of, and options for biomass utilization, the County will begin with analysis of the most limiting factors. If analysis of these factors produces positive results, the County will conduct analysis of less limiting factors until it can produce a concrete plan for biomass utilization.

Biomass Removal

Placer County has multiple reasons for being interested in removing excess biomass from County forestlands. Two particularly significant reasons are: (1) removing excess biomass produces tangible results in reducing the threat of catastrophic wildfire and increasing community safety; and (2) removing excess biomass has the potential to substantially reduce fire suppression costs. Whereas the monetary value of these two benefits can be estimated, removing excess biomass also has the potential to provide highly worthy societal benefits. Although difficult to quantify, prevention of a catastrophic wildfire will greatly benefit society and the natural environment.

There are two general means of "removing" biomass from a site. The first option is to treat biomass on-site such that either the total amount of biomass is reduced, or the characteristics of biomass are altered such that they will mitigate wildfire behavior. The second option is to transport biomass to an off-site location where it can be disposed of or processed and utilized.

Ultimately, both opportunities and constraints will likely affect the methods used for biomass removal, or whether removal activities can occur at all. These include, but are not limited to:

- Societal benefits/constraints
- Economic benefits/constraints
- Ecological benefits/constraints
- Sensitive resource (e.g., biological, cultural) benefits/constraints
- Effect on tourism
- Long-term sustainability
- Market stability

Placer County believes the consequences of not treating biomass at all are too great for "no-treatment" to be considered a viable option. Consequently, one of the initial phases of the Program will involve analysis of the various treatment options, and the opportunities and constraints associated with each treatment option. Ultimately, it is hoped that a suite of treatment options can be developed from which a particular option (or combination of options) can be selected given the characteristics and objectives of each specific site.

Placer County recognizes the advantages associated with coordinating with other groups (e.g., USFS, Cal Fire, Fire Safe Councils, and Local Fire Districts) involved in biomass removal activities. The County will encourage the coordination of forest treatments on private land with those on adjacent public land. This will facilitate the sharing of resources and assist in public outreach and education.

On-site treatment

Treating biomass on-site typically involves either burning it (through prescribed fire or "pile" burning), or mechanically modifying it (mastication). Other forms of on-site treatment include timber harvesting, grazing, or use of herbicide.

Prescribed Fire

Using prescribed fire to treat biomass enables the ecological benefits of fire to be returned to the landscape. From an economic and tactical standpoint, it can be a cost-effective means of treating large amounts of biomass quickly, and over a widespread area. It also allows biomass to be treated in areas difficult to access by humans and equipment. However, prescribed fire can only be used when certain fuel and weather conditions (e.g., high moisture content, low winds) are present, and when landscape conditions support its use. For example, steep landscapes or landscapes with several structures often prohibit use of prescribed fire. Additionally, despite careful planning and implementation prescribed fires occasionally "escape" (i.e., become wildfires in their own right). The consequence of a fire that escapes is perhaps the single biggest factor that limits in its widespread use. Placer County is well aware of this possibility.

Another factor that limits the use of prescribed fire in Placer County relates to air quality. Prescribed fire activities and meteorological conditions combine to produce poor air

quality. Poor air quality has consequences on human health, affects the natural environment, and reduces the aesthetic value of the region (among other reasons).

Placer County will work with professional organizations, the U.S. Forest Service, Cal Fire, local fire districts and the PCAPCD to improve air quality resulting from prescribed fire. Options for improving air quality associated with prescribed fire includes use of mechanized burners (e.g., air curtain destructors) and enhanced weather forecasting tools (such as RAWS and a Radar Profiler if the burning is related to the Tahoe Basin).

Mechanical Modification

Mechanical modification of biomass involves the use of equipment to convert biomass from standing ladder fuels to ground fuels, typically in the form of scattered pieces or chips. After treatment, material is not removed, but remains on the ground where it will have less chance of contributing to a crown fire. Also known as mastication, mechanical modification generally involves minimal ground disturbance, reduces germination of brush species, and can be an effective pretreatment for prescribed fire. However, it can be costly and is limited to locations where equipment can be transported.

Off-site treatment

Historically, off-site treatment of biomass involved transporting it to a disposal facility, typically a landfill. This is not an attractive option given landfill constraints and the abundance of biomass in the County. Placer County and its cities have for years been capturing this waste, recycling it, and producing various commodities (e.g., biomass to electricity and mulch) from it through the local landfill in Rocklin (Materials Recycling Facility MRF), which is jointly owned and governed by the County and the cities of Rocklin, Roseville, and Lincoln). Future plans will actually increase the amount of this material being recycled throughout the County.

Unfortunately biomass harvesting for transport and sale to viable off-site markets has not been profitable for many years due to various issues associated with material accessibility and availability. Consequently, the private biomass harvesting infrastructure that once thrived has largely collapsed. Recent advancements in biomass processing technology, in conjunction with the high cost of fossil fuels and the desire to generate energy from renewable sources has sparked a renewed interest in biomass “harvesting”.

There are differences between the mechanical methods used for harvesting and collecting biomass, and those used for fire prevention. This is primarily because of differences in project objectives; and because the size, species, and volume of target vegetation differs. Currently, neither private nor public fire prevention crews are equipped to efficiently collect, process, and transport large volumes of woody biomass to a utilization center off-site. Fire prevention crews are for the most part equipped to “modify” fuel loads in strategic locations on a three to five-year treatment cycle. Additionally, less biomass volume is treated for fire prevention purposes than that for a biomass harvest.

Placer County will investigate the options to support the restoration of infrastructure needed to treat biomass off-site. Off-site treatment options and the strategies the County

will take for investigating these options is discussed in subsequent sections of this document. Biomass harvests are most cost-effective when conducted in conjunction with timber harvests. Placer County will investigate the ability to treat biomass off-site through use of infrastructure available during a timber harvest or salvage operation, or perhaps determine a new process for the removal of both biomass and merchantable wood.

Biomass Transport and Storage

If biomass is going to be processed off-site, Placer County will need to develop a logistics network that ensures the smooth transition of biomass from its source to its destination. This will involve analysis of many factors and the enactment of several programs. The subsequent section describes factors relating to moving and storing woody biomass materials. Currently the County is able to transport and process the biomass produced by homeowners and business, and through the current system it is prepared to transport and process the projected increase in biomass that will be generated through the Program. Disposal of biomass in a landfill is not an option Placer County would consider. As a result, we only discuss the logistics behind transporting biomass to a facility where it will be converted into a valuable commodity, as this provides a potential economic benefit to the County.

Biomass Transportation Methods

The ability to transport biomass materials to existing and future biomass utilization facilities in an economically-feasible manner is critical to the success of the Program. Typically transport costs represent the most significant expense associated with an active biomass harvest operation. Placer County will advocate for several studies and demonstrations to identify the optimal methods for transporting biomass, and the additional infrastructure that will be required to do so.

Wildland biomass sources are seasonal (due to weather related issues) and widely dispersed. For the Program to succeed, transporters and storage facilities must be able to respond to changes in seasonal abundance of biomass and the geographic distribution of the source (i.e., amount to transport and location collected). The County does not have the necessary capital to invest in equipment capable of transporting and handling biomass. As a result, the County will identify contractors capable of transporting and handling biomass, and it will determine whether these contractors are capable of responding to seasonal and changes in the marketplace.

Historically, biomass in Placer County has been transported to a waste facility by waste management companies. The County will solicit them to compete for biomass “disposal” services. The County will also solicit services from private trucking and hauling firms that are capable of transporting biomass. Competition among businesses will help the County establish actual costs for handling biomass, and will enable the County to achieve the optimum operational cost.

Biomass Transportation Requirements

Currently, economies of scale are required for biomass facilities to be competitive with traditional (i.e., fossil-fuel powered) facilities. Existing biomass power facilities located within the County (SPI - Lincoln and Rio Bravo Rocklin) have a minimum annual biomass consumption rate of approximately 340,000 bone-dry tons[1] per year. Given the necessary economy of scale and need to minimize costs for a small-scale, site-specific biomass utilization program, Placer County will need to coordinate with those responsible for the existing biomass flow in the region. The logistics of securing a consistent flow of biomass into a continuously-operating facility is truly a challenge, especially at an economically viable price point.

Transport of biomass is likely to increase the number of trucks and machinery on Placer County roadways. County residents and visitors may be adversely affected by any resulting increase in traffic. The County will investigate the potential for nighttime transport of trucks and machinery associated with biomass project activities. Ideally, multiple small facilities will be present in the County, such that the distance between the biomass source and a facility is minimal. This would reduce transportation costs (both monetary and traffic).

Biomass Storage

Adequate storage and handling of woody biomass fuel and raw material adjacent to, or nearby a utilization facility is an essential element in the economic success of the facility. The presence of inadequate on-site biomass storage, sorting, screening, processing, or drying systems is commonly overlooked because of the perception of an endless supply of material (and thus no need to conduct operations efficiently). Whereas it is true that there is an extreme abundance of growing and accumulating forest biomass within the wildlands of Placer County, all processes involved in transporting and storing material must be efficient and sustainable for the facility to survive. The County will be conducting studies to look at this issue as it relates to any proposed public/private partnership facility, and it will provide the results of those studies to businesses that wish to use them for their projects.

Tahoe Biomass Removal Program

To date, the Tahoe Biomass Removal Program has been very successful. Through the program, properties along the WUI in the Lake Tahoe Basin have biomass chipped on-site, then transported to the County facility at Cabin Creek (Figure 7). From there it is hauled to a biomass facility in Loyalton where it is converted into clean, renewable energy. The County plans to enhance and expand this valuable program. Expansion of the program will give the County a better understanding of the logistics network required for a new biomass facility in the Tahoe Basin. The County will seek state or federal funding for expansion of the program, with the objective of increasing the volume of

[1]One bone dry ton represents 2,000 pounds with zero percent moisture. This is a common unit of measure used in the renewable energy and forest products market sectors.

biomass processed for utilization. Additionally, the County will promote the development of the program within the other four counties surrounding the lake (i.e., El Dorado, Washoe, Douglas, and Carson City).

Figure 7. Biomass being chipped for transport to County storage facility at Cabin Creek.

Biomass Conversion

One of the primary goals of the Program is to establish a local means of converting excess biomass into a valued commodity that provides economic and societal benefits for Placer County (Figure 8). This section of the Plan provides discussion on the strategies the County will implement in an attempt to achieve this goal. Specifically, we outline the activities and projected technologies that we will investigate in support of the Program.

Figure 8. Benefits provided by biomass utilization

Currently, establishment of a biomass energy facility in the County appears to be the most logical solution for managing excess biomass and increasing wildfire safety. Eventually almost all forest fuels will be burned by wildfire or prescribed burn, harvested for a product, or used in a biomass power generation facility. Both prescribed burning and wildfires emit significant volumes of air pollutants. Using wildland fuel in a biomass power plant reduces air pollutants by at least 75.0% to 99.9%. Besides reducing air pollutants, conversion of woody biomass into electrical power provides many other benefits. Direct or indirect benefits of establishing a biomass energy facility in the County include:

- Energy production from a renewable resource
- Reduction of harmful air emissions (such as particulate matter and hazardous air pollutants)
- Reduction in adverse public health effects from wildfire smoke
- Displacement of the need for fossil fuel usage
- Reduction in greenhouse gas emissions
- Reduction in acid rain
- Reduction in the burden to community landfills
- Creation of new jobs
- Conservation of wildlife habitat
- Forest health improvements
- Conservation of recreation areas
- Increase in aesthetic values
- Enhancement of watershed values

The PCAPCD and County biomass organizations are currently exploring ways to consider these benefits in the permit evaluation process.

The County knows that there are many challenges associated with establishing a biomass utilization facility in the County. The County intends to outline those challenges, formulate strategies to resolve them, and document solutions. To date, challenges include the following:

- Meeting air pollution and other environmental regulations
- Increasing forest pre-treatment
- Developing biomass logistics capability and funding
- Acquiring funding for new biomass facilities
- Attracting private enterprise to the region

In addition to these challenges, a sustainable business plan is critical for the long-term utilization of biomass resources. To attract potential biomass enterprises and ensure a sustainable business plan, the Program team will provide assistance with business planning, site selection, project planning, project permitting, feedstock procurement, and community outreach.

To have one or more biomass facilities built during the next several years, a variety of tasks must be implemented. Figure 9 depicts the major actions Placer County will attempt to accomplish to make facility development possible. These actions will be accomplished and funded through the partnership of public and private entities. If the County is unable to accomplish these actions it will need to revert to current biomass disposal methods.

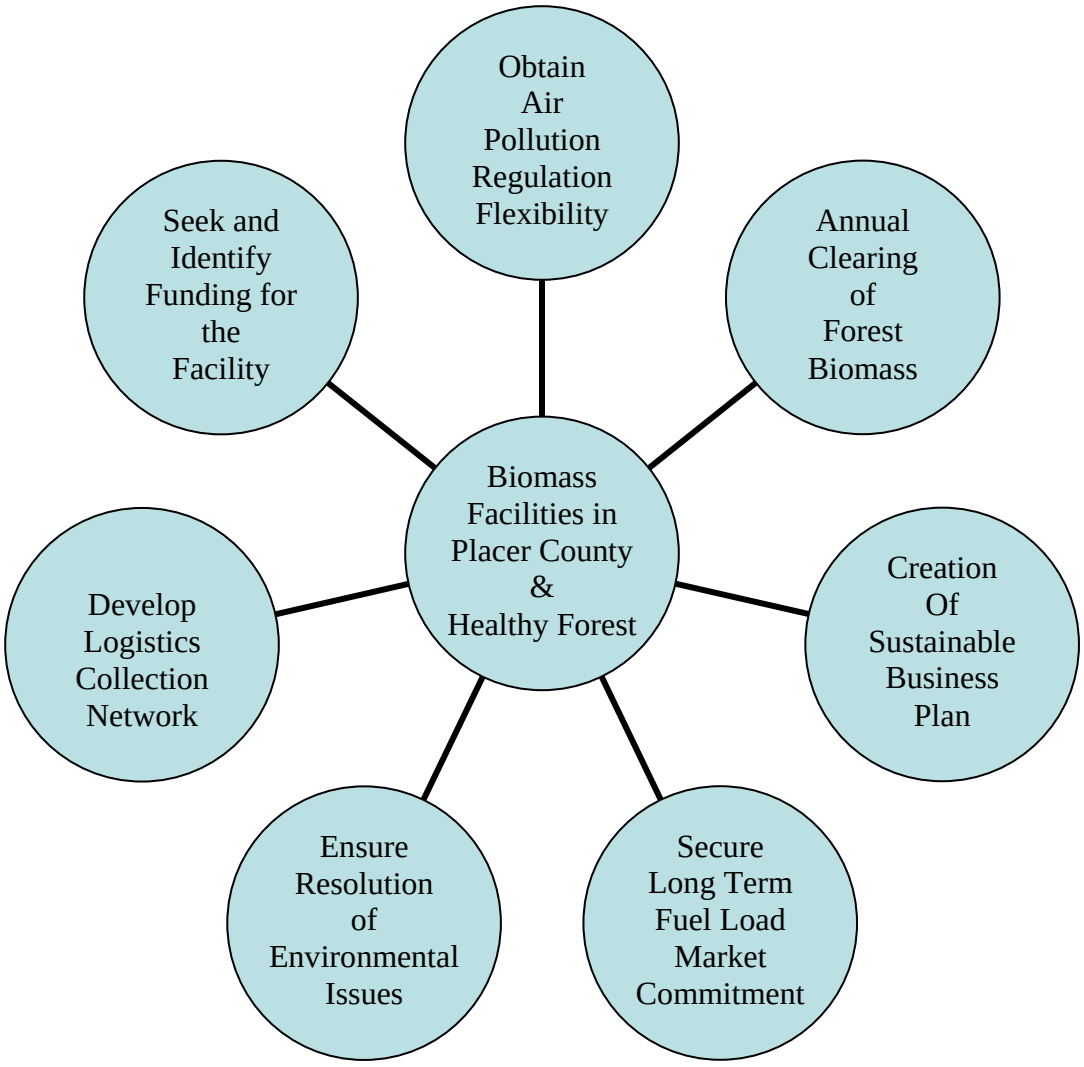

Figure 9. Actions Placer County will take or facilitate to enable biomass facility construction.

Fuel Load Projections

For a conversion facility to be successful, Placer County will need to have definitive information on the amount of biomass that can or will be available through fuel treatment projects. Information will include the annual availability of biomass in the region, and the specific location of that biomass in relation to possible facility sites. The joint (Placer County and the USFS) Coordinated Resource Offering Protocol (CROP) study that has been completed, along with existing studies that have been performed will provide requisite information on the amount of woody biomass available from federal and state-managed land. This information will be supplemented by studies conducted by the County on the amount of biomass available from agricultural operations and private land. Once all this information is available, Placer County will conduct a thorough supply and market analysis to determine the volume and seasonal availability of biomass fuel, as well as the costs to harvest, collect, process, and transport that fuel to a potential facility in the County.

Forest ecologists have provided guidelines on the types, size, and abundance of forest biomass that should be removed to promote healthy forest ecosystems and reduce risk of catastrophic wildfire. Biomass removal projects implemented by the County will conform to those guidelines. Furthermore, it is clear that the abundance and types of woody forest biomass that should be removed to promote healthy forest ecosystems (and available for use at a biomass facility) will vary over time as treatments are implemented. Placer County is cognizant of this fact, and facility feasibility analysis will incorporate projections of biomass availability over the life span of potential facilities.

Determine and Demonstrate Appropriate Technology

Technologies for biomass utilization are continually advancing. Placer County will conduct a review of current biomass utilization technologies, and generate a list of technologies appropriate for the County. The County will then analyze the ability to implement each technology deemed appropriate, and select both preferred and alternate technologies. Selected technologies will be demonstrated at an appropriate scale. In conducting the demonstration, we will work with our technology partners and affected communities to determine the criteria a technology must meet before it is implemented.

The County plans to work collaboratively with the PCAPCD, the California Air Resources Board, and the U.S. Environmental Protection Agency to develop an air quality trials program with metrics that can demonstrate the air quality benefits associated with using a biomass facility to offset wildfire and open burning of woody forest biomass.

Develop Site Plans

If the County determines it is feasible and beneficial to develop a biomass utilization facility in the County, it will need to determine an appropriate site to locate the facility. Appropriate locations for the facility will depend on the abundance and distribution of

biomass fuel, transportation issues, infrastructure, and environmental constraints. Once a potential site is located, the County will determine applicable site plans and environmental documentation before proceeding. The County will look at the affected communities for additional review to ensure that projects are scaled properly and with community support. Placer County staff will work with biomass technology consultants and experts to integrate biomass technology design into facility development plans.

Given the relatively high retail energy prices within the County, it may be most effective to place small biomass cogeneration technologies at facilities with substantial base load energy demands. These include hospitals, government centers, prisons, and manufacturing plants among others.

Other Bio-based Opportunities

With all factors taken into account and systematically evaluated, it may not be feasible to develop a biomass power facility in the County. Even if it is feasible to develop a biomass power facility in the County, there may be more appropriate uses for biomass in certain parts of the County. Plant molecules can be processed to create building blocks for industry to manufacture a wide variety of consumer goods, including fuels, chemicals, plastics, solvents, paints, adhesives, and drugs. Placer County will determine what other uses for biomass materials can be economically developed in the County. The County will also examine other beneficial (but non-economic) uses for biomass in the County. For example, wood chips and tree limbs placed in strategic locations have been proven effective in minimizing erosion. Current businesses throughout the County utilize this strategy, and the County has jointly participated in coordinating these strategies to maximize biomass usage.

Wildfire Protection and Biomass Utilization

The following strategies are common to both wildfire protection and biomass utilization aspects of the Program.

Air Quality

Although Placer County biomass research and demonstration programs will be targeted towards furthering the utilization technology base and lowering the cost of long-term energy needs, the County needs to understand, and be able to place value in improving air quality. Improving air quality can lead to numerous public benefits for the citizens of Placer County (and beyond). These include improved public health, protection of the significant visual resources of Placer County, and potential reduction in greenhouse gases (which could be of economic value to Placer County when a greenhouse gas reduction credits program is ultimately established in the United States).

Effect of Uncontrolled Combustion of Forest Biomass on Air Quality

Wildland fires release large quantities of several significant air pollutants. These include: particulate matter (PM), nitrogen oxides (NOx), carbon monoxide (CO), volatile organic

compounds (VOCs), sulphur oxides (SOx), and Hazardous Air Pollutants (HAPs). There is the potential to reduce fire-related emissions through the increased diversion of biomass to facilities where it can be utilized in a "controlled" manner. Wildfires, prescribed burning, and open pile burning in forests can produce significant quantities of incompletely oxidized combustion products. These combustion products degrade air quality by contributing to background levels of gaseous and particulate matter pollutants, and they serve as precursors to criteria air pollutants (as defined by the federal Clean Air Act). Air pollutants not only impact visibility, but can impact local and regional human health.

Effect of Biomass Utilization System in Controlling Pollutants

Air pollution control experts have determined that use of a biomass facility can reduce air pollutant emissions by >97% over current open burning practices. Specifically, there can be a 95% (or greater) reduction of PM, a 75% (or greater) reduction of NOx, a 98 % reduction of CO, a 97% reduction of VOCs, a 99% reduction of toxic metals, and a 99.9% reduction of toxic organics (i.e., HAPs)(Figure 10).

Biomass power facilities that produce both electricity and heating/cooling power can accomplish the following:

- Support hazardous fuels reduction.
- Result in a net improvement in air quality.
- Reduce waste material destined for landfills.
- Co-produce transportation fuels (as emerging conversion technologies become available).

Quantification of Air Quality Benefits

The establishment of new biomass utilization facilities in Placer County is currently constrained by existing local, state, and federal air regulations that do not take into account the benefits of controlling emissions at a stationary facility versus the uncontrolled emissions from open burning and wildfires. Placer County will seek ways, both through technical and scientific investigations and subsequent policy development in cooperation with state and federal agencies, to "offset" emissions from biomass utilization facilities that use biomass otherwise likely consumed by uncontrolled burning. Biomass power plants that use fuels reduction material for feedstock should be allowed to take credit for reducing overall net emissions, both in criteria pollutants as well as greenhouse gasses (GHGs).

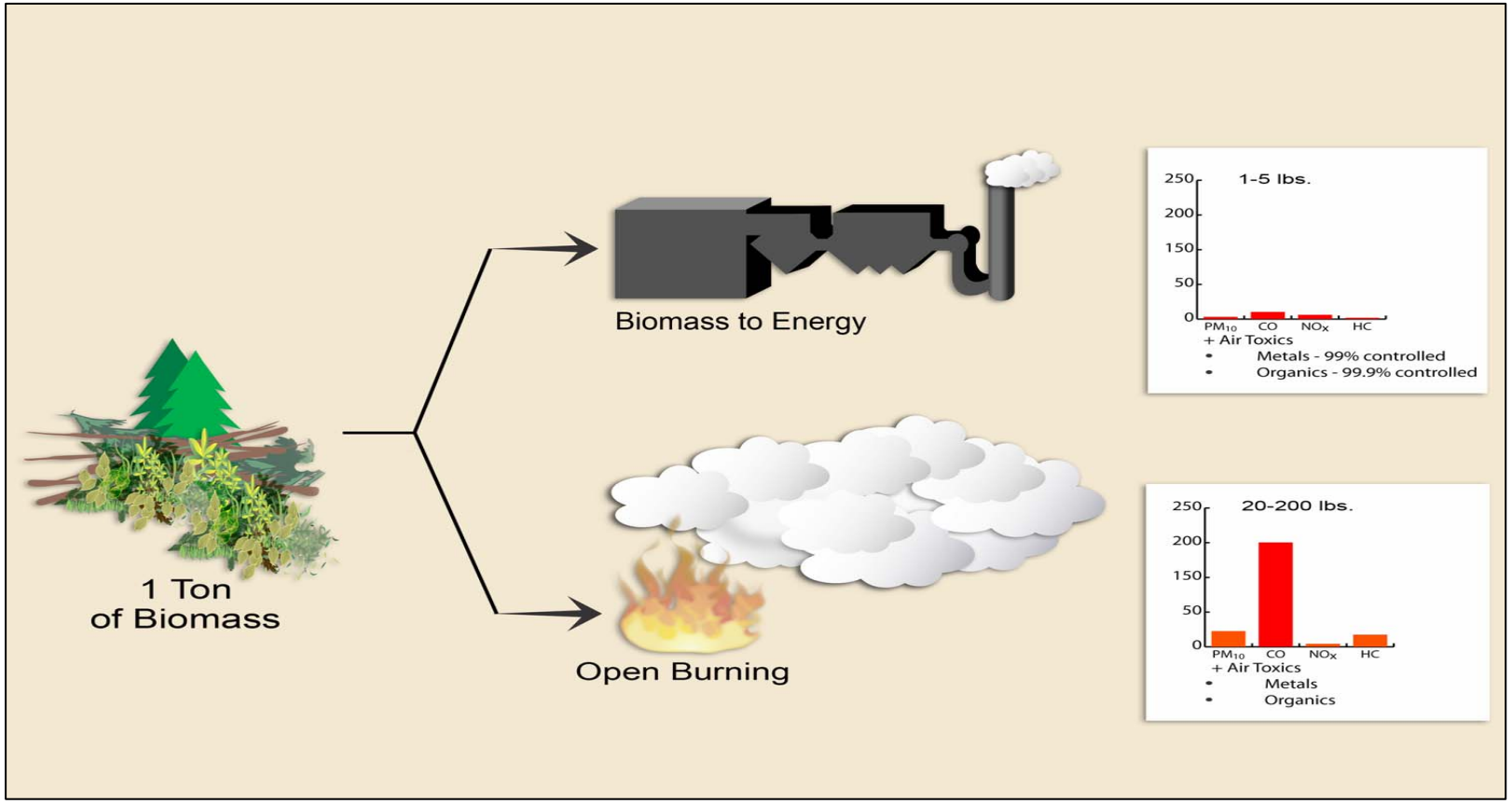

Figure 10. Difference in emissions between open and controlled burning

The PCAPCD is exploring ways of factoring in the "total benefits" of a biomass project into the air quality permitting evaluation process, as well as seeking ways to quantify avoided emissions from fires to use as emissions offsets, which in Placer County are necessary for permitting purposes. The PCAPCD, along with Placer County and other partners will continue to seek funding for the necessary technical and scientific investigations needed to demonstrate the benefits of offsetting air pollutants from open burning of forest biomass. These benefits will need to be endorsed by both state and federal air quality regulatory agencies in order to be utilized on a project permitting basis. Placer County has begun working with the California Air Resources Board and the U.S. Environmental Protection Agency so that their regulatory and statutory needs are incorporated into the permitting process.

Outreach

To better serve the public, the County intends to provide information on the Program at a variety of venues and through a variety of means. Information will be presented in lay terms to maximize the public's understanding of Program goals and developments. Information the County anticipates providing to the public includes:

- Defensible space accomplishments
- Forest thinning and treatment accomplishments
- Adverse effects of smoke, particulate matter, and other air pollutants on air quality and human health
- Biomass (the material)
- Biomass utilization possibilities (technologies)
- Economic/environmental biomass life cycle analysis
- Forest stewardship
- Economic development of potential technologies
- Status of the Program and specific projects

This material can be disseminated directly to the public, or adapted to support regional, state, or national events in which the County is often asked to participate. In preparing information, the County will incorporate the most currently available materials and metrics to provide accurate, factual, and open information.

One of the primary means of keeping the public informed on the status of the Program will be through the use of an active website. The County envisions the website as an open forum that contains information on program activities, the status of grants, annual accomplishments, and feedback from the community.

Education

Education is one of the best tools for fire prevention and safety. Placer County's public outreach and education programs are designed to educate landowners on fire risk and ways of reducing it. The County believes educating landowners encourages them to conduct responsible pre-fire mitigation actions. Placer County currently supports fire professionals and their supporting Fire Safe Councils by participating with the California Fire Safe Council and Alliance, and by staying informed of current fire prevention legislation and practices. Placer County provides free informational materials through the Fire Safe Alliance for distribution at community meetings. In addition, Placer County officials visit over 3,000 County property owners annually. During these visits landowners are provided free educational material on fire safety.

Through the Program, Placer County intends to continue educating the public on fire prevention and safety. The County plans to provide comprehensive information to the public on:

- Creating an effective defensible space
- Human behavior before, during, and after a fire
- Effects of smoke-filled air on human health
- Uses for biomass (e.g., mulching, erosion control)
- Burning alternatives and best burning practices
- Wildfire management organizations (e.g., fire safe councils and alliances)

In collaboration with the County Public Information Office, the County will develop strategic alliances with public and private partners to develop a Public Education and Community Awareness Campaign that provides information on alternative means of hazardous fuels reduction and biomass utilization. Campaign components could include:

- Campaign logo/slogan contest
- Community forums/town hall meetings
- Summits/seminars (e.g., Tahoe Summit)
- Community recognition programs (that recognize exemplary "Fire Safe Neighborhoods/Communities")
- School educational/curriculum materials to K-12 grade levels
- A fire safe/biomass newsletter
- Legislative briefings to the local delegation
- A biomass web site

As the County demonstrates its efforts over time, it will be mindful to provide the public with Program accomplishments. The County plans to use the newspaper, community

meetings, websites, various publications, and biomass conferences to present information on Program accomplishments.

Program Management

Placer County must concentrate on making progress on both aspects of the Program: wildfire safety and biomass utilization. To ensure progress, Placer County must remain focused on meeting the Program's explicit goals. Strategies for ensuring progress include working collaboratively, conducting advance planning, using up-to-date information to make decisions, or simply accomplishing worthwhile activities that promote greater community-wide benefits.

For each intended project, a plan will be developed to ensure success. Strategies, budgets, metrics, and measures of success will be detailed and reviewed by the policy team prior to initiating any individual project. Rather than start from scratch, the Program should capitalize on information and plans that have been (or are currently being) developed by other pertinent agencies, groups, or organizations. Building on the efforts of others will enable the County to develop stronger projects and ones that are more readily acceptable in the community.

Although the Program is specific to the communities in Placer County, the County has aligned Program goals and objectives to coincide with those published by federal and state resource agencies. This will ensure that the County is well aligned for funding opportunities, and that the County can actively participate in regional and national technology review and strategy sessions.

Many of the activities in the Strategic Plan will require the County to understand new technologies and processes. The County intends to methodically and regularly evaluate new technologies and processes that may be relevant to the Program. The County also intends to demonstrate select technologies or processes as a means of validating their potential to the relevant parties.

Partnerships

There are numerous organizations around the region, the country, and the world that have unique perspectives on the topics pertaining to the Program. There are also many other groups performing activities similar or symbiotic to those proposed in this Strategic Plan. For the Program to be successful, Placer County must engage the diverse expertise and knowledge of other organizations, agencies, and individuals. To do so, the County intends to create a partnership comprised of federal and state agencies, private companies, environmental groups, industries, utilities, financial institutions, educational institutions, and members of the public. From this partnership, the County intends to build a core group of managers, employees, and consultants with which to derive strategies, plans, and demonstrations. The partnership would subsequently review and comment on these strategies, plans, and demonstrations. The County anticipates this

process will lead to a better program, and one that is acceptable to all and implemented appropriately.

Placer County intends to share information on the successes and setbacks of the Program with all others that may benefit from that information. The County will do this through presentations, printed media, the Program's website, and other appropriate means. In addition, the County will promote all relevant regional meetings, programs, and conferences that can either assist or be assisted by the County.

Technical and Business Partnerships

For Placer County to be successful in the biomass field it will need to attract and promote leading technical partners that can help determine the County's best opportunities for biomass utilization. In particular, it is absolutely critical that the County cultivates private interest in the biomass utilization component of the Program. In addition, a joint public-private venture requiring matching investments will leverage limited public funding and reduce risk exposure. The County's approach will be to look for partners who are willing to invest time, money, and expertise into helping the County achieve Program goals. Incentives for partners to join the County include the eventual business opportunities that may arise if any biomass utilization facilities are developed. Placer County has already been approached by several private firms and educational institutions hoping to be involved in biomass utilization plans. The County plans to investigate the technologies offered by these firms, as well as their performance history and ability to adhere to budgets.

Stewardship Contracts

One of the long-term goals for Placer County is to participate in a Stewardship Contract project in the Lake Tahoe Basin, the Tahoe National Forest, or both. Initiated in the 2003 Appropriations Act, Public Law 108-7 grants the BLM and USFS a ten-year authority to enter into stewardship contracts or agreements to achieve agency land management objectives and meet community needs. One of the primary functions of a Stewardship Contract is to conduct treatments to improve, maintain, or restore forest health. Stewardship contracting differs from other existing contracting authorities in the following manner:

- Contracts are selected by the agencies on a best value basis.
- Contract length may exceed five years but will not exceed ten years.
- The agencies may apply the value of vegetative products removed as an offset against any services received (goods for services).
- Any excess offset value of vegetative products removed may be applied to other stewardship contracts (net proceeds retained by local national forest).
- A multiparty monitoring and evaluation process is required.
- Collaboration with stakeholders is encouraged.

The contracts will allow private companies, communities, and others to retain forest products in exchange for the service of thinning trees and removing brush or other hazardous fuels. Long-term contracts foster a public-private partnership to restore forest health by providing assurance to those who undertake implementation of the contract. This enables them to invest in equipment and infrastructure without worrying about contract stability. Equipment and infrastructure is needed to productively harvest, collect, process, transport, and utilize material generated from forest thinning projects. Small diameter logs, brush and other woody biomass, can be removed, and utilized for value-added purposes: from lumber, to soil amendments, to the production of heat and electrical energy. Lastly, stewardship contracts may offer key solutions in support of a more reliable flow of biomass feedstock material for utilization at delivered values independent of public subsidies traditionally required for biomass removal projects on public lands.

Adaptive Management

In executing plans for the Program, the County will monitor advancements in the latest techniques and technologies associates with fire science, fuels treatment, mitigation of impacts to sensitive resources, and biomass utilization. As a result, the County will continue to educate itself on new technologies and research, and it will be prepared to transition to any new technologies or strategies that are more applicable to Program goals.

Population and demographics are likely to change over the course of implementing the Strategic Plan. Societal needs and expectations may change with these population and demographic changes. Throughout the course of the Program, the County will make an attempt to assess the long-term (beyond 5 years) needs of the County, and incorporate those needs into the Program, as applicable.

Peer review of the County's strategies will ensure the approach is appropriate and that the Program maintains its objectives. The County will consider inviting outside (i.e., other than Placer County) organizations to assist in measuring the success of tasks, and to provide a critical review of the status of the Program.

Good strategic plans are not static; rather they evolve to reflect new knowledge, needs, and strategies. Placer County intends to update this Strategic Plan at least once a year to document progress, assess goals, and to confirm the vision, strategy, roadmap, and program elements.

Budget

The County will work with its Economic Development staff as well as other outside agencies to develop business models for the various biomass utilization-related programs the County will promote. Some of these business models will be further developed by private enterprises taking responsibility for Program activities (e.g., biomass facility operation).

In finalizing this version of the Strategic Plan, the County will need to determine its long-term financial commitment to the on-going operations and maintenance costs of projects. This will likely involve analysis of the long-term economic viability of the Program as a whole, and the funding available for the various County-based projects that have been proposed. Once this process is complete, annual budgets should be appropriated to ensure progress can be made towards reaching Program objectives, and to determine the amount of additional funds required from federal, state or private sources.

To maximize the possibility of success, select aspects of the Program should not rely on grant funding or other tenuous sources. Instead, county funding should be available to allocate as necessary. For example, county funding should be available for creation of defensible space, and it will be needed to manage biomass if biomass energy facilities in the County do not materialize. Although the Program will require County funding, ultimately the Program is dependent on successfully obtaining various grants. With that and potential cost savings in mind, the County should consider developing and funding a position for an additional grant writer.

Funding

Placer County has prepared a comprehensive Strategic Plan that has outlined ambitious activities to reach the objectives of the Program. Most of these activities will require funding. Fortunately, the County has federal and state legislative advocates to assist in identifying potential funding sources. Nonetheless, Placer County will need to develop a strategy for obtaining timely and sustainable funding if the full potential of the Program is to be realized. In addition to county discretionary funding, funding will be pursued from a combination of local, state, federal, and private sources to complete what the County has proposed.

Federal Sources

The most likely federal funding source for catastrophic wildfire prevention activities is through competitive grant opportunities provided by the U.S. Forest Service. The woody biomass utilization grants administered through the Forest Products Laboratory are particularly appealing to the Program. There may also be discretionary funding available through the Forest Service's wildfire suppression program accounts.

The BLM is the lead implementing federal agency for the Southern Nevada Public Lands Management Act (SNPLMA). An eligible expenditure of funds under the SNPLMA is for environmental restoration projects set forth in the Lake Tahoe Restoration Act. Because "forest health" is included as an environmental restoration activity as defined by the Lake Tahoe Restoration Act, funding may be available through the SNPLMA. For Placer County, the limitation with SNPLMA money is that it may only be used for a project in the Lake Tahoe Basin. The County will explore the potential for obtaining SNPLMA funds for projects that improve forest health by removing excess biomass.

Congressionally-directed funding for catastrophic wildfire prevention activities may be available through the Interior-EPA spending bill. This bill funds the U.S. Forest Service, Bureau of Land Management, and U.S. Fish and Wildlife, among others. Whereas there is not a traditional "earmarked" account under the Forest Service section of this bill, Placer County will pursue advocacy efforts through its elected Representatives.

Congressionally-directed funding for biomass utilization activities could be requested through the Energy and Water appropriations bill, or possibly the Interior-EPA spending bill. In the last few fiscal years, the energy section of the Energy and Water appropriations bill has provided funds for Congressionally-directed energy supply and conservation projects. In fiscal year 2007, Placer County was fortunate to acquire one of the few targeted Congressional earmarks for biomass projects.

State Sources

In 2006, California voters passed Proposition 84. Proposition 84 authorizes $5.4 billion in general obligation bonds for safe drinking water, water quality, and water supply; flood control; natural resource protection; and park improvements. Specific funding for wildlife and forest conservation includes:

- $180 million for forests;
- $135 million for wildlife;
- $90 million for natural community conservation plans; and,
- $45 million for protection of farms, ranches, and oak woodlands.

Placer County plans to pursue grant opportunities available through Proposition 84 funds.

Every January the Governor's new budget will be submitted to the legislature. The County anticipates each budget will have significant funds for some or all of the following programs:

California Department of Forestry
-Vegetation Management Program
-California Forest Improvement Program
-Forest Stewardship Program
-Forest Legacy Program

California Resources Agency
-California Tahoe Conservancy Grant Programs (Proposition 40 and 50)
-Sierra Nevada-Cascade Conservation Grant Program (Proposition 50)
-Sierra Nevada-Cascade Conservation Grant Program (Proposition 12)

California Environmental Protection Agency
-Emergency Response and Disaster Preparedness

California Integrated Waste Management Board
-Reuse Assistance Program

California State Legislature
-Legislation regarding specific funding for targeted programs

In 2007, the Governor's initial budget included funds to build a woody biomass facility in the Lake Tahoe Basin. Unfortunately those funds were removed when the Legislature conducted its negotiations. The County hopes the funds will be reintroduced and approved in next year's budget. Placer County will monitor funding for these programs and will be prepared to capitalize on any funding opportunities that are available to support the Program.

Timeline of Events

Due to the complexity of our efforts (i.e., prevention of catastrophic wildfire and biomass utilization), separate timelines are displayed below to provide clarity on lower level programmatic goals for each aspect of the Program. Figure 11 portrays the Proactive catastrophic wildfire prevention roadmap and Figure 12 shows the Biomass utilization phases roadmap.

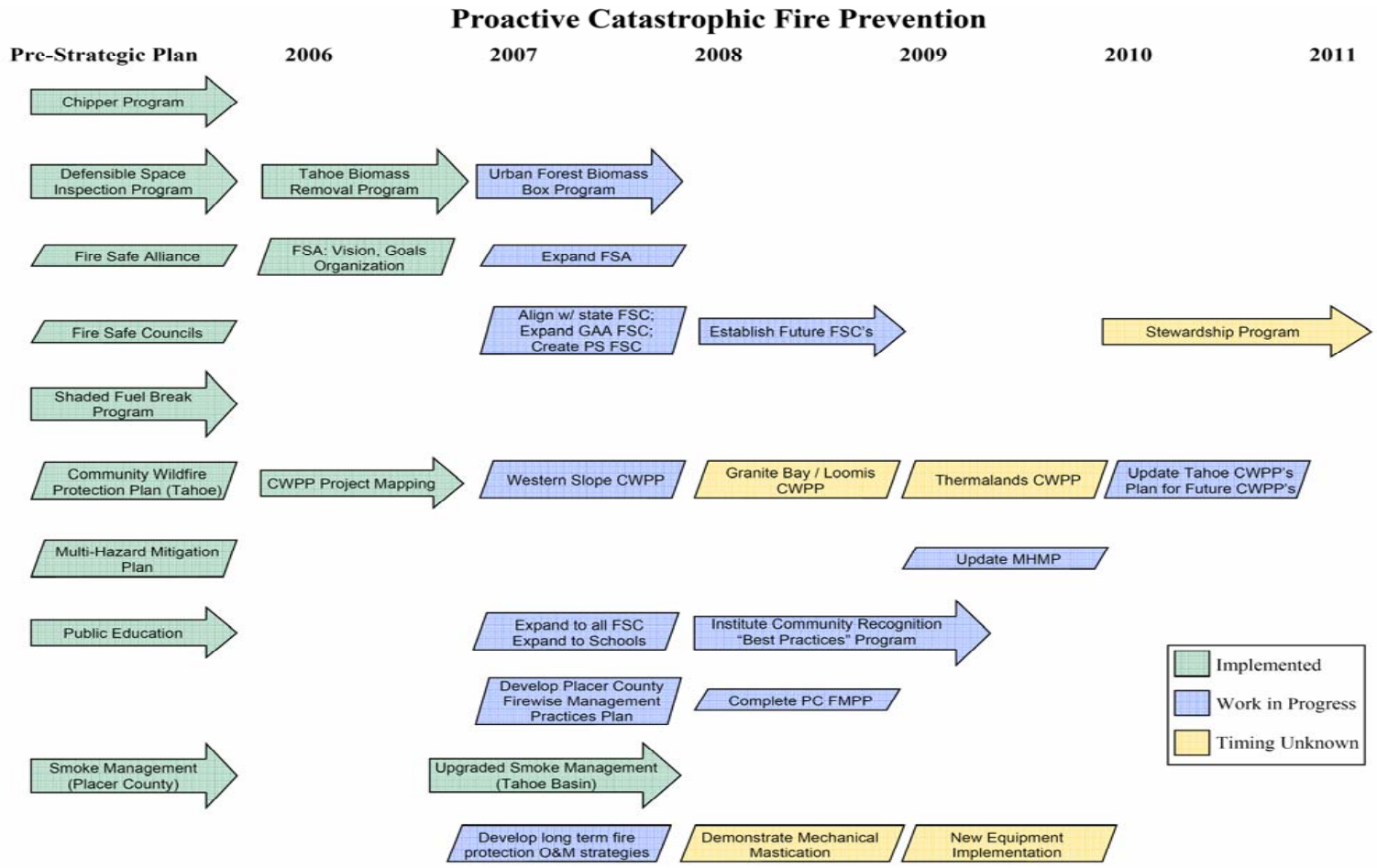

Figure 11. Proactive catastrophic wildfire prevention roadmap

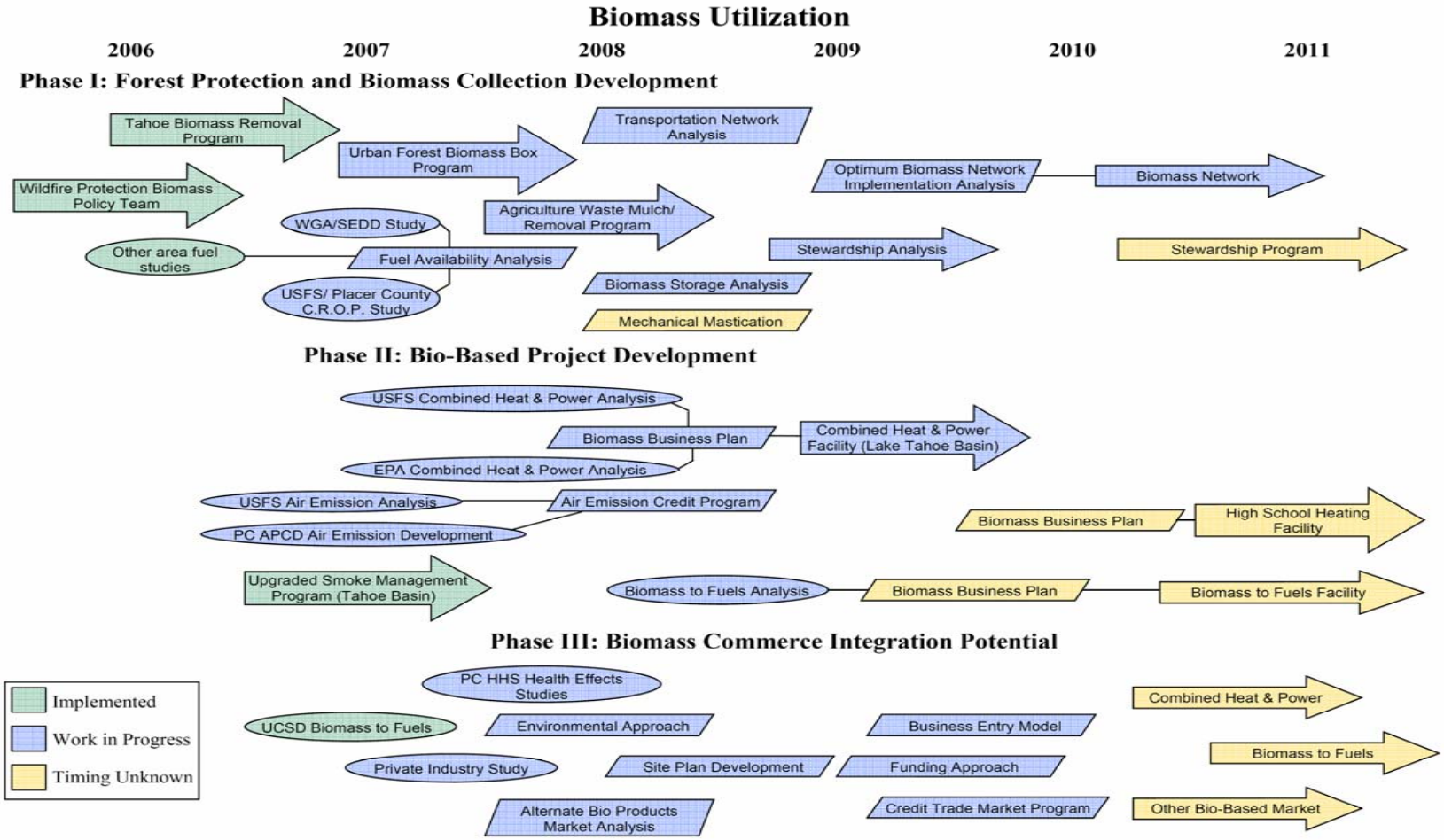

Figure 12. Biomass utilization phases roadmap

ACKNOWLEDGEMENTS

This document was created and written for the Board of Supervisors by the members of the Placer County Wildfire Protection and Biomass Utilization team. We would like to acknowledge Scott Cashen, Frederick Tornatore, and Tad Mason of TSS Consultants for their additional input and editing to complete this document. Additionally we would like to thank all of the local County fire agencies, Cal Fire, USFS, the California Tahoe Conservancy, the California Energy Commission, the EPA, the California Biomass Collaborative, the League to Save Lake Tahoe, the Sierra Club, the Sierra Forest Legacy, Steve Holl Consulting, and other members of the public for their input, guidance, and positive review of our efforts to date.

Placer County looks forward to more public interaction as we implement this Strategic Plan.

LITERATURE CITED

Berry, A. 2007. Forest policy up in smoke: Fire suppression in the United States. Available online: < http://www.isnie.org/assets/files/papers2007/berry.pdf>. Accessed 2007 Aug 28.

[Cal Fire] California Department of Forestry and Fire Protection. 2007 May 10. Cal Fire home page. < http://www.fire.ca.gov/wildland_terminology.php?filter=D>. Accessed on 2007 Aug 22.

[CEC] California Energy Commission. 2006 November. Available online: < http://biomass.ucdavis.edu/materials/reports%20and%20publications/2006/2006_Biomass_Roadmap.pdf>. Accessed on 2007 Sep 27.

[GFC] Georgia Forestry Commission. 2007. What is Prescribed Fire? Available at: < http://www.gfc.state.ga.us/ForestFire/PrescribedBurning.cfm#Certification>. Accessed on 2007 Aug 23.

McKelvey, K.S.; Skinner, C.N.; Chang, C.; Erman, D.C.; Husari, S.J.; Parsons, D.J.; van Wagtendonk, J.W.; Weatherspoon, C.P. 1996. An overview of fire in the Sierra Nevada. Pages 1033-1040 *in*: Sierra Nevada Ecosystem Project, Final Report to Congress, Vol. II, Assessments and Scientific Basis for Management Options. Davis, CA: University of California, Centers for Water and Wildland Resources. Report No. 37.

Morris, D. and I. Ahmed. 1992. The carbohydrate economy: Making chemicals and industrial materials from plant matter, The Inst. for Local Self Reliance, Washington, DC.

[NIFC]. National Interagency Fire Center. Not Dated. Wildland Fire Statistics. Available online: <www.nifc.gov/stats/index.html>. Cited in Berry 2007.

[NRCS] Natural Resource Conservation Service. 2005 May. National Handbook of Conservation Practices: Fuel Break – Code 383. Available at: < ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/383.doc>

Stephens, S.L. and J.J. Moghaddas. 2005. Experimental fuel treatment impacts on forest structure, potential fire behavior, and predicted tree mortality in a mixed conifer forest. Forest Ecol Management 215:21-36.