Auberry / Eastern Fresno Bioenergy Site Review and Community Meeting

Some members of the community in Auberry, CA have expressed interest in developing a 3 MW or less bioenergy facility. In May 2014, the Yosemite-Sequoia Resource Conservation & Development Council obtained funding from the California Statewide Wood Energy Team and the Sierra Nevada Conservancy to complete third-party site review and conduct an informational community meeting.

This document includes:

1. Site review matrix completed by TSS with information on 4 sites:
    a. Auberry Mill, site #1
    b. Shaver Lake Area, site #2 a, b & c
    c. U.S. Forest Service – SNF, site #3
    d. Sierra High/Middle School
2. Meeting notes as compiled by Yosemite-Sequoia RC & DC
3. Presentation given by TSS at community informational meeting

Compiled by:

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Work completed in part with funds from:

Eastern Fresno County Bioenergy Facility Site Review Matrix

Site Status	Site 1: Auberry Mill	Site 2a,b & c: Shaver Lake Area	Site 3: U.S. Forest Service - SNF	Site 4: Sierra High/Middle School	Information Sources	Comments
Current Land Use Zoning	M3 & Conditional Neighborhood Beautification (APN128-450-58)	HW 168/SL East a). 120-08-012TP Dinkey Crk Road b). 120-12-027TP c). 133-03-049RC	RC40 Dinkey Crk / Stevenson Crk Rds Markwood Meadows Area	AE40 APN 128-07-063 Weldon Farm 33330 Lodge Road, Tollhouse	Fresno County Planning Department (http://www.co.fresno.ca.us/Departments.aspx?id=182)	Preferred Zoning: M-1, M-2, or M-3 Industrial
Environmental Clean Up Status	LUST Site Clean-up closed 2003 Case 5T10000654	None Known: a). Active Hydro Facility/substation b). Former Landfill c). Former Sawmill	None Known	None Known	California EPA Geotracker (http://geotracker.waterboards.ca.gov/)	Environmental remediation can be very expensive and could greatly hinder a project. Ideal site has already been cleaned and had the appropriate studies performed.
Road Infrastructure / Site Access	Easy Access	a). Shared Perimeter Rd? b). Easy Access c). Easy Access	Easy Access	Easy Access – across from school site	Fresno County Department of Transportation (http://www.co.fresno.ca.us/departmentpage.aspx?id=6032)	Can tractor trailers access the site? Would there be any turning issues? Is there sufficient line of site for truck traffic to safely enter and exit the site?
Grid Stability / Infrastructure	Substation in vicinity & 70KV Tap Line	Projected Peak Load 26.9 MVA Substation No. 2260 – 14.0MVA capacity Voltage 33/12KV	Projected Peak Load 26.9 MVA Substation No. 2260 – 14.0MVA capacity Voltage 33/12KV	Projected Peak Load: 7.59 MW	PG&E Solar RAM Map Site (http://www.pge.com/b2b/energysupply/wholesaleelectricsuppliersolicitation/PVRFO/pvmap/ - scroll down for the link over the "FAQ" heading, must sign in with a free account)	Looking for a high Projected Peak Load and a high Total Distributed Generation number.
Proximity to Residencies	Low Density M Zoning	None – Forest Lands	None – Forest Lands	Low Density RR5 AE Zoning	Google Maps (http://maps.google.com)	This is important aspect of community support and can be factored into CEQA and Air Permitting. Noise, dust, and traffic may be issues of concern.
Community Support	Supportive Community Highway 168 FireSafe Council Sierra RCD	Supportive Community Highway 168 FireSafe Council Sierra RCD	Supportive Community Highway 168 FireSafe Council Sierra RCD	Unknown	Fire Safe Council. Biomass Work Group, Local Knowledge of Communities	This is an important local perspective as some communities may be more open to this type of development than others.

Eastern Fresno County Bioenergy Facility Site Review Matrix

Site Status	Site 1: Auberry Mill	Site 2a,b & c: Shaver Lake Area	Site 3: U.S. Forest Service - SNF	Site 4: Sierra High/Middle School	Information Sources	Comments
Water Supply / Discharge	Wells on site	Unknown	Unknown	Wells on site	Local Water Utility District & Local Wastewater Treatment Facility	While water demand for bioenergy processes may vary significantly by technology, water demand for fire safety is significant for these developments.
Site Conditions	67 acres – Pavement & concrete	2a)Current Hydo facilities with large graded area 2b) Former Landfill 2c) Former Mill	Unknown	Large graded areas, partial gravel	Site Visit	Is the site graded? Are there any known soil conditions? Are there any adjacent uses (school, community buildings, etc).
Site Availability	Available – Negotiable with owner	Unknown / Public Lands	Unknown / Public Lands	Unknown	Contact Current Ownership regarding the status of the property	Is the site available for purchase or lease?
Potential Value Added Operations	Sawmill located across the street w/ expansion capabilities Biomass Business Complex	Pine needle disposable by local community FireSafe disposal vs. open burning	Pine needle disposal by local community FireSafe disposal vs. open burning	Vocational / Science Programs Community FireSafe disposal vs open burning	Local Knowledge of Contractors and Local Entrepreneurs	Collocation of heat or electricity offtakers can be helpful. Collocation of value-added products manufacturing (e.g., post/poles, compost/mulch, firewood).
Potential for New Market Tax Credits (NMTC)	Not Qualified	Not Qualified	Not Qualified	Not Qualified	NMTC Maps (http://www.cohnreznick.com/nmtc-mapping-tool)	Search by address or Zip Code. New Market Tax Credits can provide addition funding opportunities.
Enterprise Zones	Yes Fresno County as a whole thru 6/26/2022	Yes	Yes	Yes	Enterprise Zone Maps (http://ajed.assembly.ca.gov/californiaenterprisezoneprogram1)	Search by address or Zip Code. Enterprise zones can provide tax incentives.
Recycling Market Development Zone (RMDZ)	Yes Fresno County as a whole	Yes	Yes	Yes	RMDZ Zone Map (http://www.calrecycle.ca.gov/RMDZ/Reports/Zones/)	Can facilitate low-interest loans, technical assistance and free product marketing.

Meeting Notes | Eastern Fresno County Bioenergy Feasibility Study
Pre-Feasibility Informational Meeting
May 22, 2014
6:30 pm – 8:00 pm

Welcome/Opening Remarks
Steve Haze, Sierra Resource Conservation District

- Sierra Resource Conservation District(Sierra RCD) works in the Eastern Fresno County area
- Board members live in our area, and we deal with issues like range land management, invasive species, restoration, and education
- This is an opportunity for you to ask any questions you may have related to the health of our forest, biomass, what will it mean for jobs, impacts from catastrophic fire, how this relates to natural resources
- Biomass issues started a 12 years ago, when there was a conference in Visalia
- When mills closed we lost a lot of jobs
- Recently we have seen a lot of progress made related to our forest, protecting our foothill and mountain communities, and increasing our economic benefit
- North Fork community worked on this project together and developed it – they have obtained a conditional use permit from Madera County Board of Supervisors
    - Started with the cleanup of a brownfield in North Fork
        - Now we are in phase 5 of financing and construction
    - Sierra RCD will be supporting North Fork as they go into construction phase
- This is the initiation of a feasibility study, and we want the public to provide feedback and be involved in the process
- Q: Will you get everything out of the forest?
    - Some amount of material that may or may not be removed
    - Concerns about the forest being shut down due to yellow legged frog and Yosemite toad
- Q: Where is North Fork Mill?
    - The old mill site
- Q: Frame the context of biomass utilization? What is it's purpose in the community?

Meeting Format and Agenda Review
Jodie Monaghan, Center For Collaborative Policy

- The facilitator went over the meeting format and reviewed the evening's agenda
- Goal of this meeting is to make sure that you get all of your questions answered

- If we cannot answer them tonight, we will make sure we answer them in a subsequent meeting

Community Scale Bioenergy Utilization in California
Elissa Brown, Sierra Nevada Conservancy

- In development means there are people in the area interested in exploring a bioenergy facility
- So why forest bioenergy?
    - Forests are overstocked with fuel, and the fuel that needs to be removed is largely the small diameter trees
    - Large diameter trees have the timber value, which frequently pays for the other restoration, because small diameter timber does not make money or loses money
- Biomass facilities offset these losses and put more money
- SNC wants to redevelop a forest bioenergy industry
- Bioenergy is not the only way to use biomass, but it uses a lot of it and it is a large stable product because it gets power purchasing agreement
    - Kind of like Macy's in a shopping mall – big and it's always going to be there, even if boutiques come and go
- Over 50 mill sites in CA have closed over the last 20 years
- We want to re-establish the biomass industries, which sounds good but it's challenging because this is new plants, new technology, and is not a big money maker
- Main product is electricity, and communities can make money by selling it to power utilities
- State has passed new policies because they want to support renewable energy, including forest bioenergy facilities
- Created an auction to set the price that only includes forest bioenergy facilities – starting auction price of 12.4 cents
- Local community benefit and public benefit for the whole state – water, transmission lines, etc.
- SB1122
    - There is support for community scale bioenergy – SNC brings communities together and funds them
- North Fork Biomass Facility
    - Lot of community work and support went into the North Fork facility
    - North Fork is your pioneer/trailblazer representative of the progress
    - Community Development Council owns it and uses the proceeds, hopes to promote the co-location of businesses nearby
- Development process

    - Starts from the community, it does not start from businesses
    - Community organizations do a feasibility assessment by convening stakeholders
    - Feasibility studies cost about $50,000 but there are grant funds available
    - Once you've done the feasibility study, then choose a developer for design and engineering
- Questions
    - Q: Would you be working with a local developers and local contractors?
        - If locals have the experience or technology
        - If on National Forest, then we can work with them on getting contracts
    - Q: Noise and smell impacts
        - Minimal
    - Q: distribution lines?
        - Any power distributed from the plant would be to co-located businesses - you can buy from the site, but just off-site it doesn't work
    - Private owners can purchase power from a solar array/farm but the same system can't be applied to bioenergy in the form we are discussing currently
    - Q: purchasing power outside of the utility models?
    - Q: Who directed the steering committee in North Fork?
        - Site owner, the community development council, with a board of community organization members
        - But North Fork is and has always been community driven
    - Q: Who is directing the steering committee here?
        - Currently Sierra Resource Conservation District, with support from Sustainable Forests and Communities Collaborative
    - Q: is there a way to make our own power and be energy independent?
        - Form a municipal utility district, or you can form a community choice aggregation
        - Once you form a group, it is sort of like buying insurance, and you can buy at a cheaper rate and chose your resources
        - Want energy that is cheap and reliable
    - Q: Land with the biomass resources is owned and managed by the Forest Service and by Southern California Edison
        - One of the things you look at in a feasibility study is what do local land managers have planned
        - We can negotiate contracts to provide biomass, the North Fork project is again an example of how we can proceed.

Forest Bioenergy – An Introduction
Tad Mason, TSS Consultants

- Biomass may eventually be converted into liquid biomass fuels, but that technology is many years away
- In the meantime, bioenergy facilities create power, heat, and biochar
- Not dependent on wind and sun, and very dependable since it turns waste product into energy
- Air quality benefits – no uncontrolled combustion, so less air impacts, as opposed to piling and burning
- These also create dependable family wage jobs
- Healthy forests (handout pg. 12, 2nd slide)
    - Red zones are forested ecosystems that are at extreme risk to wildfire
    - We have missed so many fire return intervals, which creates a lot of fuel build up
- There is anecdotal and growing scientific evidence that thinning can reduce fire risk
- Placer county air district
    - Monitored the emissions from the power plant with open pile burning
- Q: will you buy a burn pile?
    - This may be part of the plan, providing chipping services or disposal
- Q: biomass at lower elevation(2,000-4,000) may have a lower cost?
    - Brushing is challenging to work with, maybe use a baler, but they are costly
    - Oak trees are useable, other hardwoods are challenging/costly
- Also looking at agriculture fuels as well – orchard trimming, tree trimmings, etc.
- CA counties are mandated to divert 50% of their waste away from landfills, like Fresno's biomass facility
- Need to meet a new standard for biomass disposal
- Q: Impacts of the yellow legged frog and Yosemite toad endangered listing?
    - We don't anticipate any major impacts to biomass harvesting, this is not on the same level as the spotted owl impacts of a few years ago
- We Look at historic levels of biomass availability to forecast forward and determine what is sustainably available considering existing environmental compliance requirements
- Placer County - 2 MW project near Truckee – region that you can cover with a one hour haul radius
- Feedstock needs to be environmentally and economically available
- Banks want a 10 year secure supply, and 3x the amount of biomass than you really need
- Knowing the feedstock allows you to choose your technology
- Types of technology
    - Combustion plants – combustion of biomass creates heat, uses heat to convert water into steam which turns a turbine and creates power
    - Gasification – introducing chips 3 inches and smaller, fairly dry 20-25% moisture, into a reactor or vessel at very high heat without oxygen(no combustion)

        - Changes the chips from a solid to a gas(hydrogen and methane), clean up the gas, apply it to a generator
        - Biochar and syngas properties
        - Need to just get it kick started, and then it generates its own heat from the products
    - Ex: the one in Merced owned by phoenix
        - This produces syngas and biochar
- Q: Noise and odor concerns?
    - Chips will be stored, so there will be a wood smell, there will not be smell from the plant
    - 80 – 85 decibels 200ft away
- Q: number of jobs?
    - In the plant, 5 per jobs
    - So 5-8 in one MW site
- Q: So we could potentially scale up?
    - Yes
- 2 truckloads of chips per day, though there may be more as the woods are open or action is occurring
- Loader also operating on-site
- Biochar
    - Major product from gasification; sought after soil amendment for carbon fixation
    - Up to 60% per pound
- Potential sites
    - Auberry mill site – 65 acres, PG&E substation closely located, as well as transmission feed line, zoned for business, and part of the beautification initiative in Fresno
        - New plant would be smaller than the old cogeneration plant that is there now
    - Former landfill in Shaver Lake Area
    - Also historic mill site in Shaver Lake
    - Southern California Edison – Rich Bagley
        - On the north east side off of 168 they have a hydroelectric substation, so that is another potential opportunity
        - Feedstock from the private forest is regardless
    - Sierra High School – Welden farm area
        - Small scale biomass facility offering career opportunities or training programs
- We want to hear about other sites
    - 168 corridor as near to it as possible is ideal
    - Could even have multiple final sites

Site Selection and Consideration
Tad Mason, TSS Consultants and Steve Haze, Sierra RCD

- There are different considerations required for the sites, identified in a matrix
- Zoning, road access, infrastructure, room, proximity to residences, community support
- If the community does not support it, it's not a project
- Highway 168 FireSafe Council and Southern California Edison are supportive
- Looking for maximum community involvement
- Q: does the old mill have the only good enough water source?
    - The process doesn't require much water
- C: This community is built on the forest, and we should revive the mill, and is there any way that we can move this process forward in a more streamlined way
    - Not at this time, need wide community support
- Q: is there a comparable plant that we could go see?
    - Mariposa Biomass Project (http://mariposabiomassproject.org/index.html) is planning a field trip to the Merced plant owned by phoenix energy, we will send out information about that
    - We can also work on organizing a field trip for Auberry residents in coordination with the Friends of the Auberry Library
    - Phoenix energy is the developer for North Fork

Next Steps
Jodie Monaghan, Center for Collaborative Policy, and Steve Haze, Sierra RCD

- State Wood Energy Team applied for grant money for four bionenergy feasibility projects, including Auberry
- Sierra Resource Conservation District has a certain amount of funding to go toward a full feasibility study
- We may think that the Auberry mill site is a good choice, but we have to make sure we have looked at all our options for when we apply for funding for grants, and when we go to developers
- Remediation of dump sites may have better opportunities, or it may be better to locate it near the school for training opportunities
- Feasibility gives us a chance to really explore all of our options
- We will make the full slides available
- We are available for you to contact
- Within 45 days we will be convening our first session and conferring with the Forest Service to get the District Ranger to attend to show their support

- Dinkey Landscape Restoration Project is very important to this process
    - Next DLRP meeting on July 28th at the High Sierra Ranger District Office
- North Fork provides us a model to work off of if we want
- Participants should get involved with the forest plan revision process – public meeting in Fresno on June 16 at the Holiday Inn Fresno Airport, 5090 E. Clinton Fresno
- Tom Katchpole: this isn't something new to this area, we've had chipping and biomass thinning in the area before, we can do it again

Forest Bioenergy – An Introduction

Bringing Bioenergy
Opportunities to
Eastern Fresno County
May 22, 2014

Tad Mason, CEO
TSS Consultants

TSS Consultants

- TSS established in 1986 – principal focus was biomass to power
- Continue to assist project developers, government agencies, utilities, and tribal entities with bioenergy development and projects – biopower, biogas, biofuels, and bioproducts

What is Biomass?

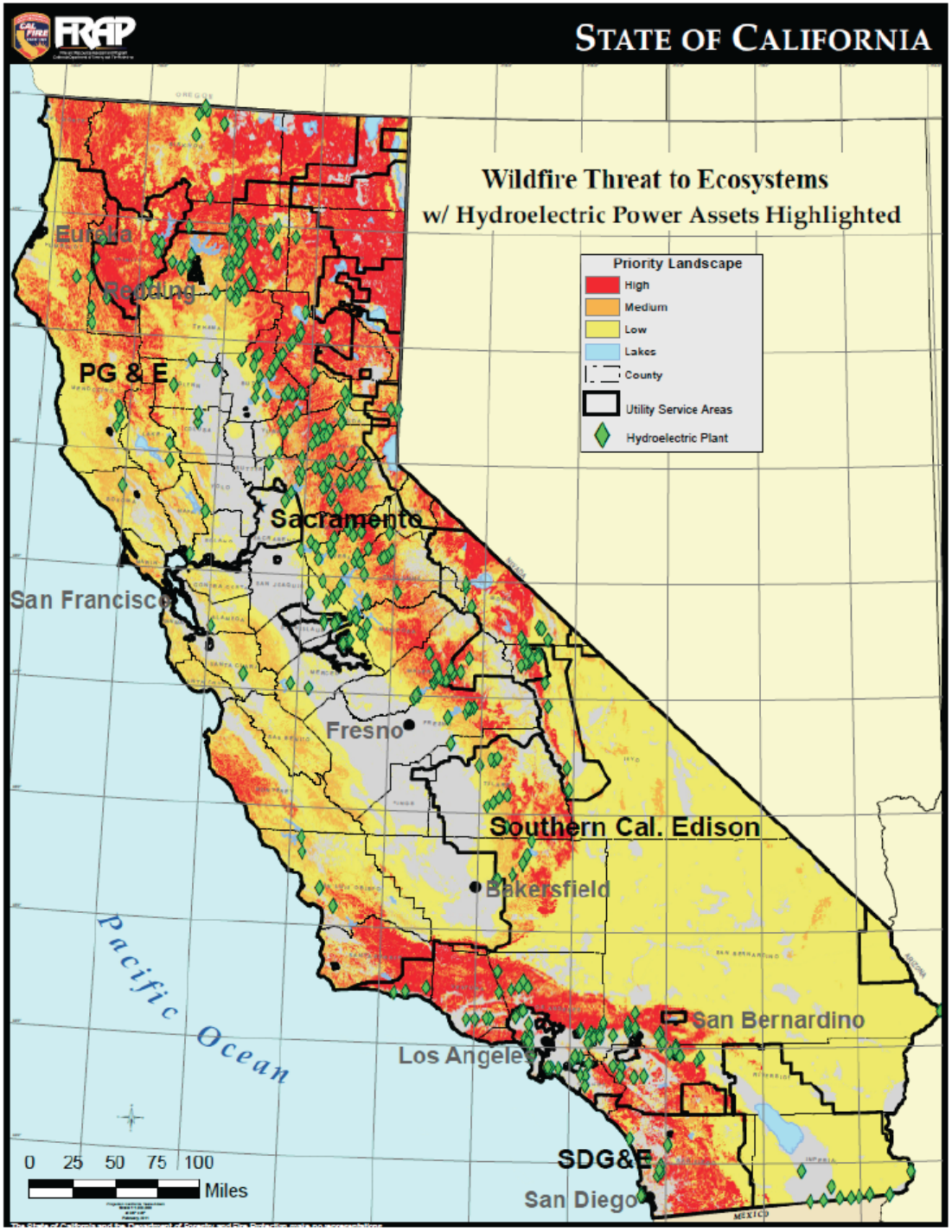
- **Biomass** – any solid, nonhazardous, cellulosic material derived from: forest-related resources, solid wood wastes, agricultural wastes, and plants grown exclusively as a fuel.*

*based on the definition of biomass in the 2005 Energy Act

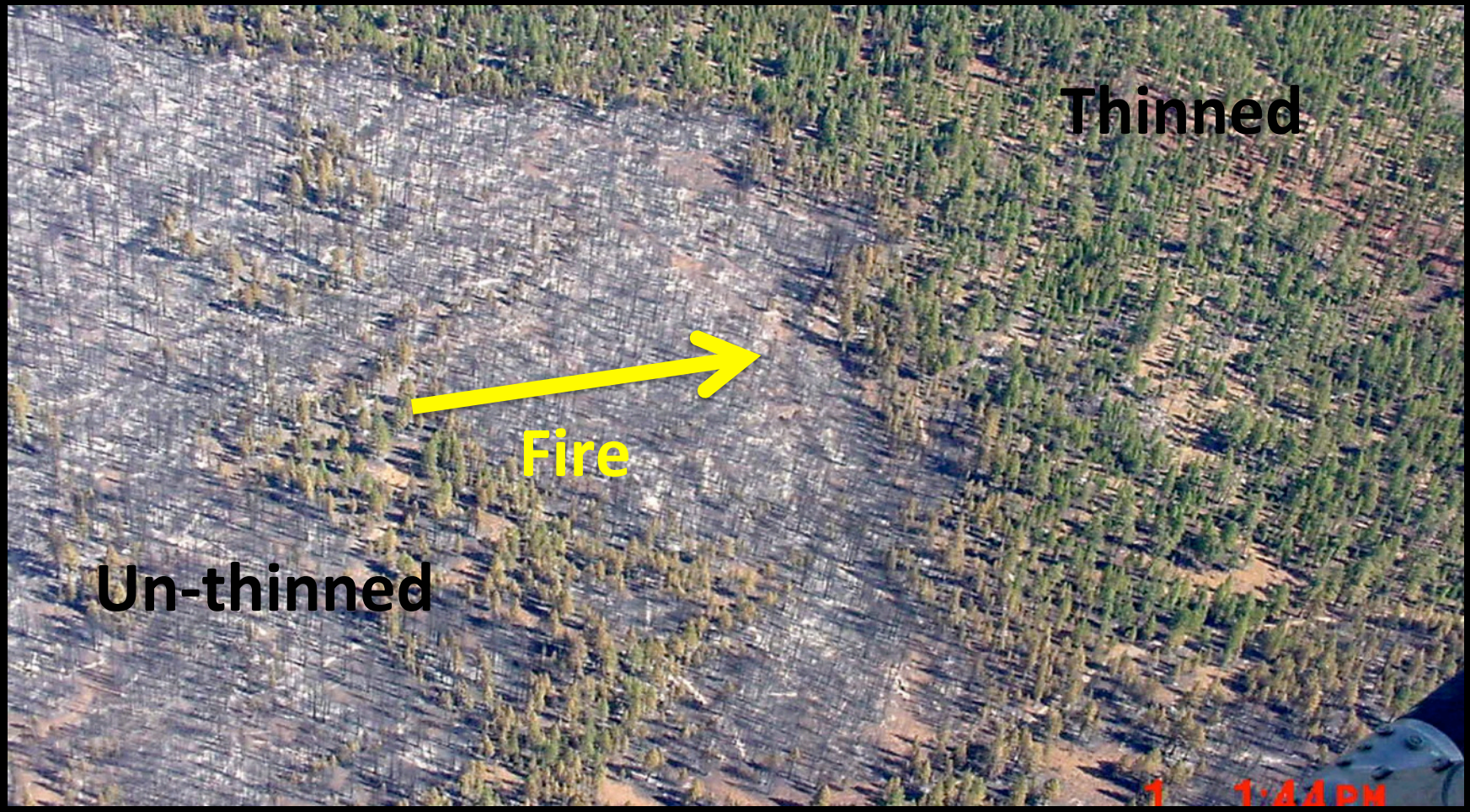
Potential Benefits of Biomass Utilization

- Renewable energy, transportation fuels, and bio-based products
- Provides base load (24/7) electricity
- Turning a waste into a product
- Air quality benefits
- Greenhouse gas reduction
- Rural economic development
- Healthy forests/reduce wildfire potential

Why are healthy forests important?

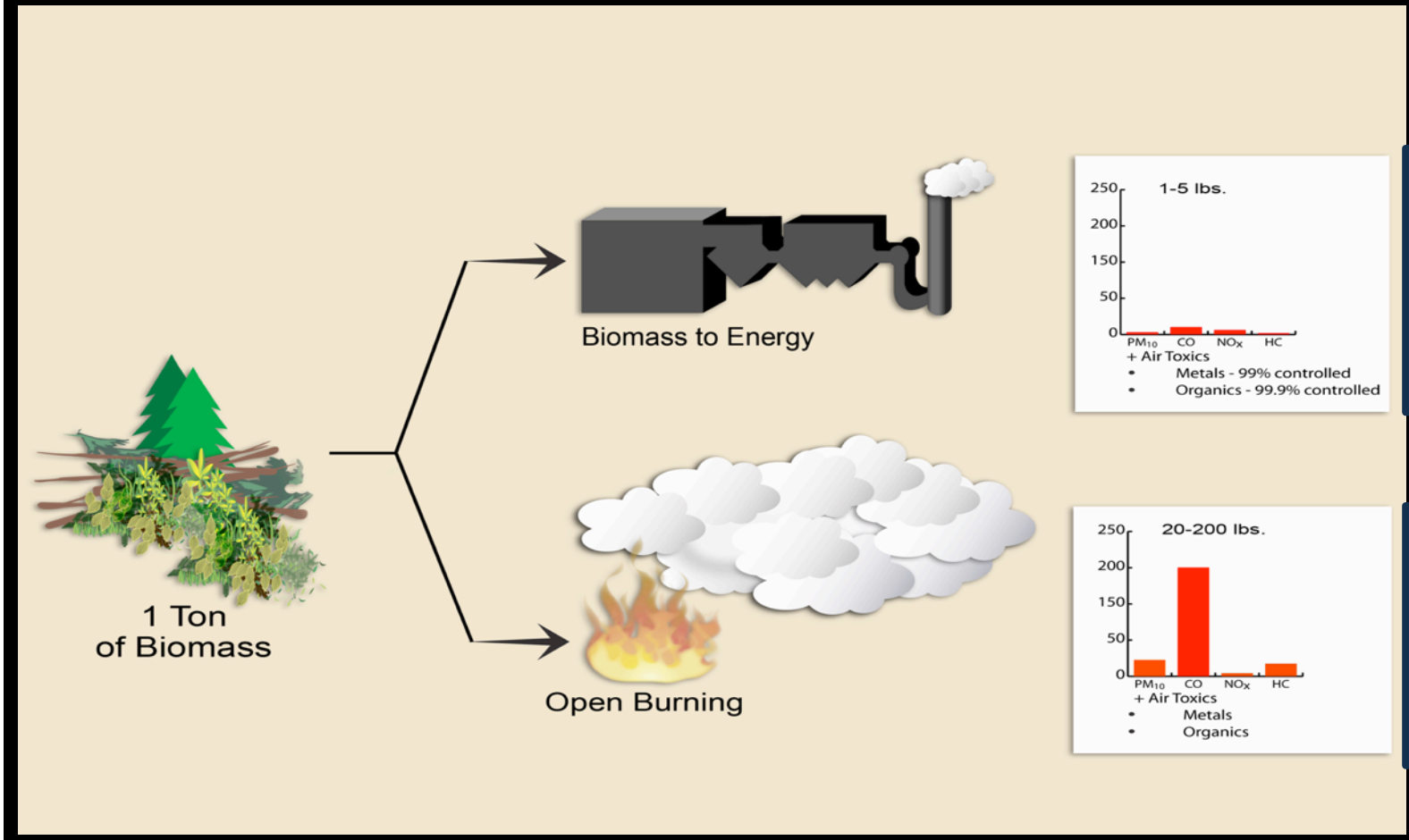


Positive Effects of Fuel Treatments



Cone Wildfire, Lassen National Forest, September 2002

Woody Biomass Energy Production - Reduces Overall Emissions from Open Burning



Controlled Facility Combustion 1-5 lbs of pollutant released to atmosphere per ton of fuel

Uncontrolled Open Combustion 20-200 lbs of pollutant released to atmosphere per ton of fuel

Graphic courtesy of Placer County Air Pollution Control District

New Influencing Factors Effecting Bioenergy Facilities

- Growing waste disposal issues/opportunities
- Renewable energy gov't mandates/incentives including Senate Bill 1122
- New financial and owner groups looking for renewable energy business deals
- Fossil fuel pricing – abrupt current and future price increases
- Acceleration in the development of new biomass to energy conversion technologies
- Greenhouse gas reduction opportunities

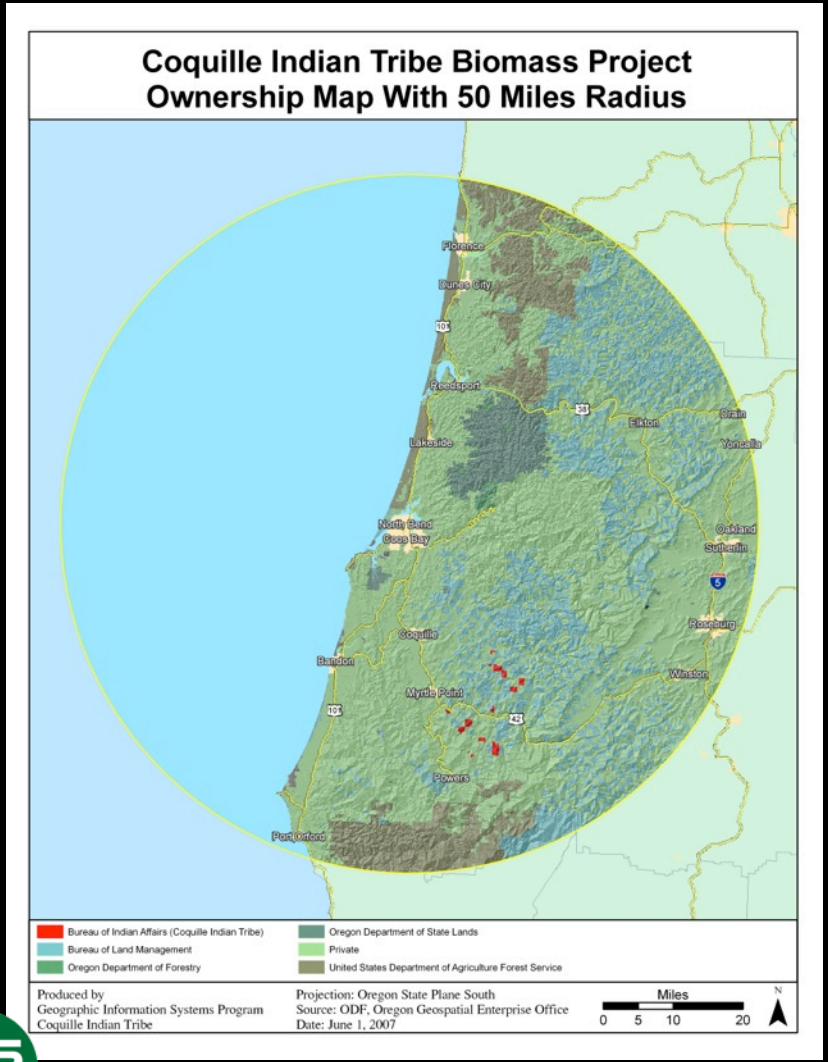
SB 1122

- Enacted in 2012
- Requires 250 megawatts of biomass power procurement:
  - 110 megawatts from wastewater treatment, organic waste diversion, food processing, and codigestion
  - 90 megawatts from dairies and agricultural waste
  - **50 megawatts from sustainable forest-sourced biomass**
- Rules being developed at CPUC under the Renewable Market Adjusting Tariff (Re-MAT) proceeding

Principal Steps of a Bioenergy Project

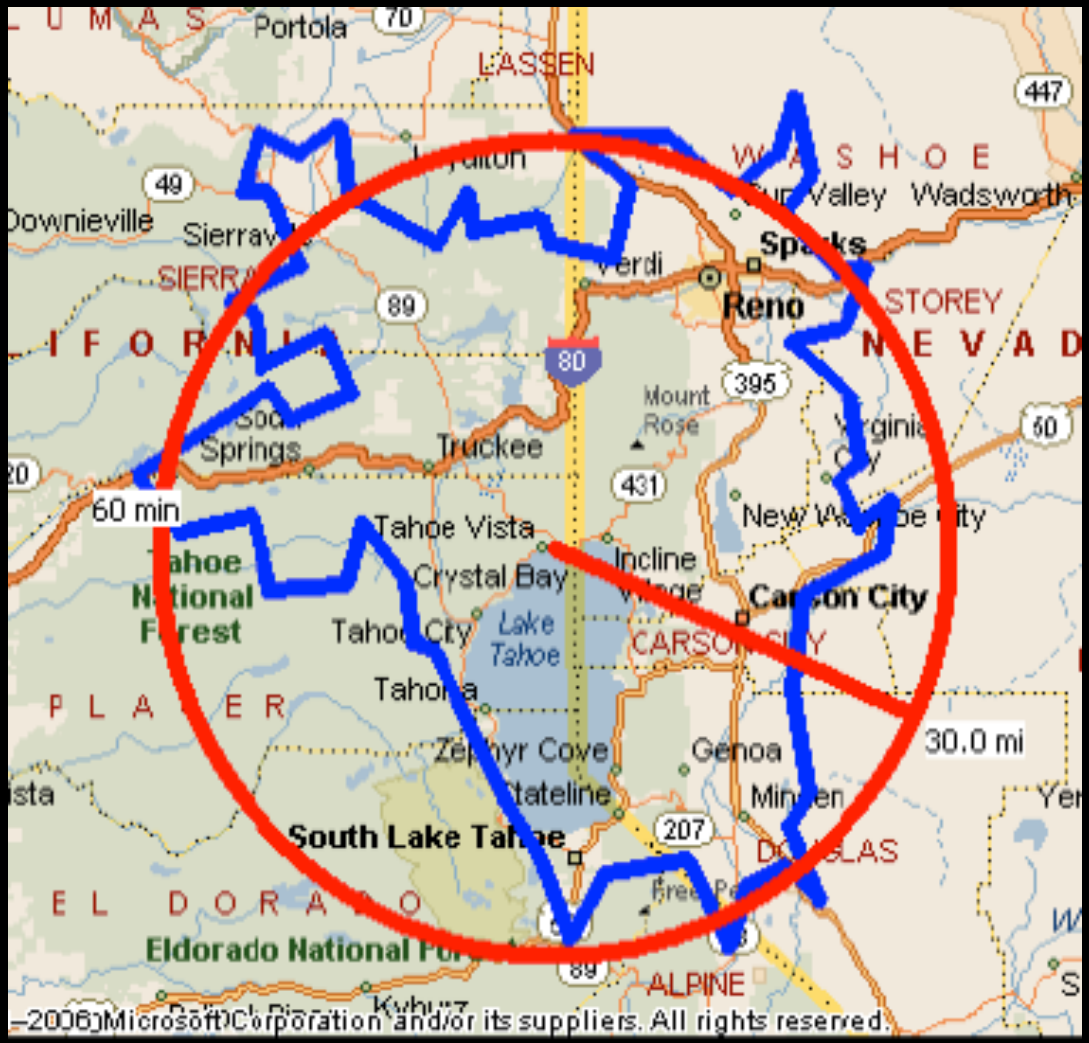
- Resource Assessment
- Siting and Environmental
- Technology Selection
- Project Economics/Financial Analysis
- Secure Feedstock with LT Agreement(s)
- Off take Agreements (power/heat)
- Secure Project Financing
- Design and Construct

Biomass Resource Assessment – Doing the Assessment



- Assess available resources within a physical and economic boundary
- Begin with available data and information
- Interview potential sources and others knowledgeable of local and regional biomass resources
- Scaling the potential facility

Resource Assessment Mapping



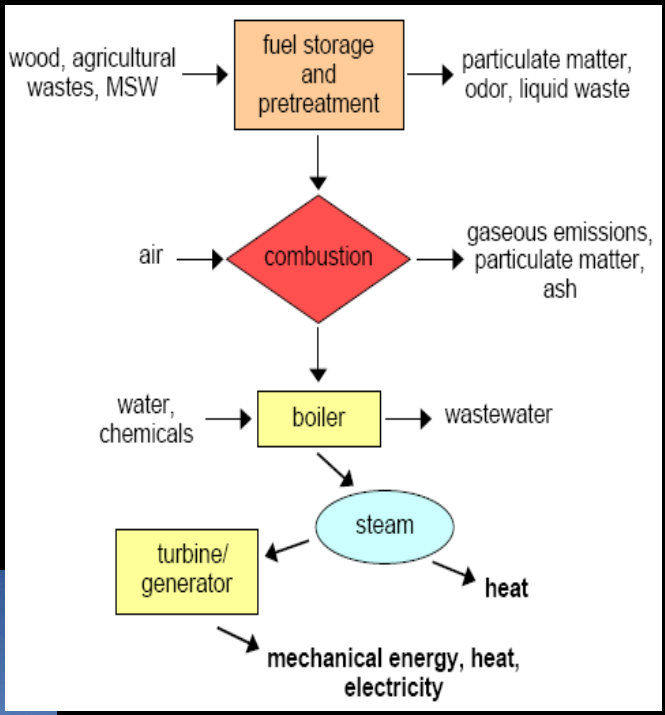
Biomass Feedstock Assessment – What is necessary to know?

- Sustainable long term supply located within close proximity (< 50 miles)
- Economically available
- Environmentally available
- Meets quality specifications
- Available in quantities and from diverse sources that support project financing
  - ✓ Minimum 10 year supply, 70% under contract
  - ✓ At least 2.5 – 3 times facility usage (fuel supply coverage ratio

Technology Evaluation & Selection

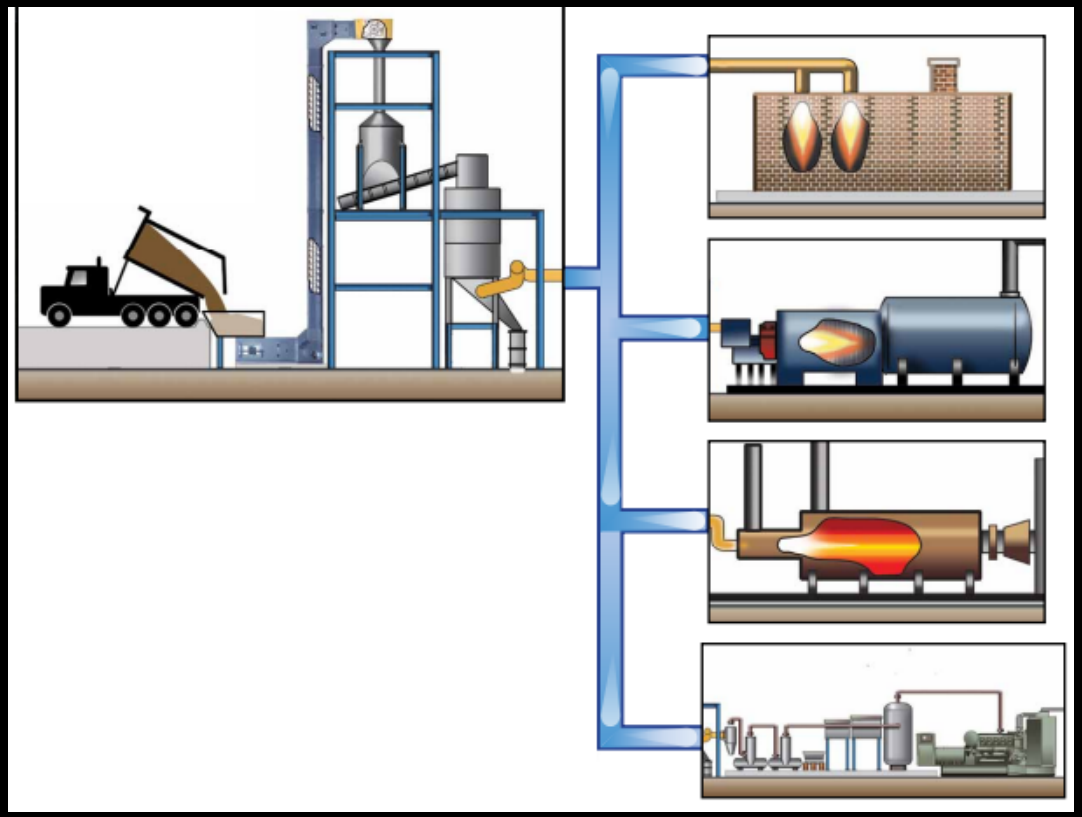
- Search for most appropriate technology considering project location and biomass supply
  - ✓ Ability to convert local supply into heat, power, and/or transportation fuels
  - ✓ Must meet local permitting specifications
- Technology should be proven
  - ✓ Operates efficiently on available biomass supply
  - ✓ Operates cleanly on available biomass supply
  - ✓ Appropriate for site and local/regional resources

Combustion Technology



Gasification

Gasification converts biomass to a combustible gas (a.k.a. syngas)



Phoenix Energy
(Ankur)

All Power Labs

Biochar

- Process
  - ✓ Thermochemical treatment, developed through gasification
  - ✓ Separates water, VOCs, & hemicellulose in woody biomass. Also breaks the cellulosic structure of the wood at 700-1000°C
  - ✓ Produces a carbonaceous residue

    Biochar can be between 75%-85% fixed carbon
  - ✓ Results yield 7%-20% of the original mass

Site Selection Considerations

- Location relative to feedstock resources
- Current Land Use Zoning
- Power grid capacity and infrastructure
- Community Support
- Site conditions/site availability
- Potential collocation of value-added enterprises

Potential Sites in Eastern Fresno County

- Auberry mill site
- Shaver Lake Sites
  - Substation
  - Former landfill
  - Former sawmill
- US Forest Service – Sierra NF
- Sierra High/Middle School

Project Economics

- Sustainable and economical fuel supply
  - ✓ Fuel/feedstock supply typically represents the highest variable cost for a biomass facility
- Existing incentives
  - ✓ Production Tax Credits
  - ✓ Local incentives – enterprise zone
- Markets for power, heat, fuels, and byproducts
  - ✓ Market support justifies capital investment
- Return on investment
  - ✓ Return on Investment (ROI) of 20%+

Implications for Eastern Fresno County

- Reduces potential for wildfire
- Improved air quality (fewer wildfire and open burning emissions)
- Conversion of wood waste to renewable power
- New, sustainable, family wage jobs

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