



Operation of the Courthouse Annex Biomass Facility

- Overview of the initial plan
- Sierra Institute's evolving role and cost challenges
- Going forward (how this fits into the larger picture)



Crescent Mills Wood Utilization Campus

Stakeholder Outreach

Plumas County:

- Plumas Unified School District
- Fire Safe Council
- County Officials
- Hospital Administrators
- Feather River College
- Portola City Council
- Plumas National Forest
- Forestry Professionals

Regional:

- US Forest Service
- State Agencies
- UC Berkley
- State Wood Energy Team
- Biomass Working Group
- Other Communities

Objectives:

- Identify critical public facilities
- Develop effective Advisory Body

Danielle Banchio, Registered Professional Forester
#2808

Nick Boyd, Feather River College Director of Facilities

David Keller, Plumas County Community Development
Commission

Charles Plopper, Professor Emeritus, UC Davis

Dony Sawchuk, Plumas County Director of Facility
Services

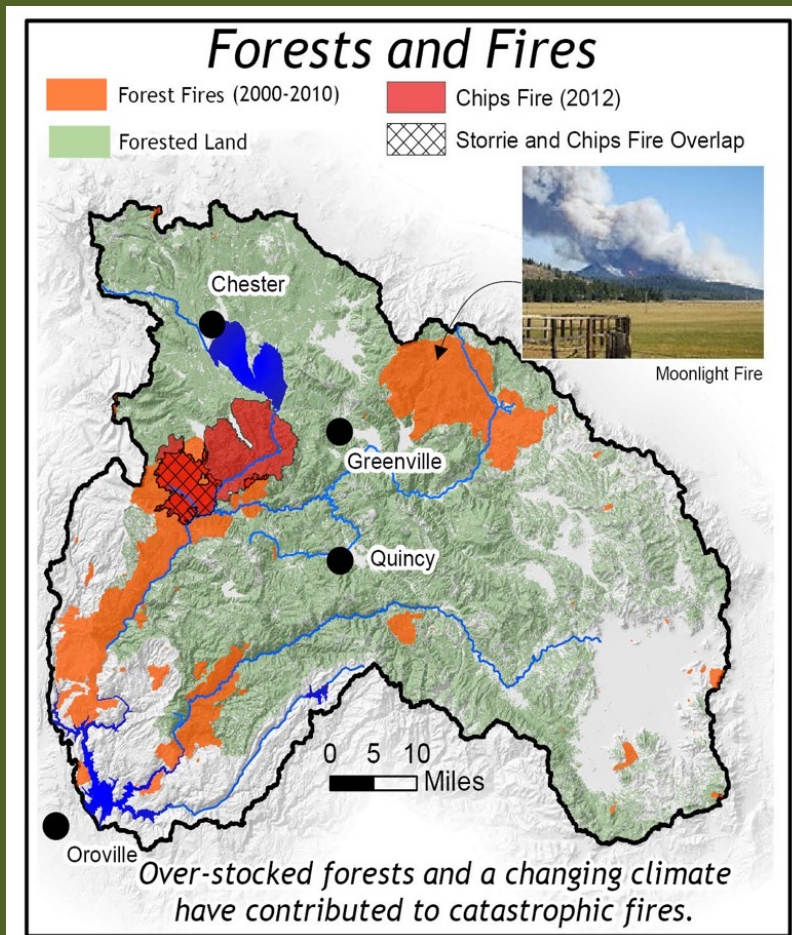
John Sheehan, former Executive Director of Plumas
Corporation

Lori Simpson, Plumas County Supervisor District Four

Elaine Vercruysse, Logging Systems Planner with the
Plumas National Forest

Randy Wilson, Plumas County Planning Director

Value of Increasing Biomass Utilization



- Reduce fire risk
- Improve forest health
- Improve air quality and reduce black carbon emissions
- Stabilize heating costs
- Create local jobs
- Reduce fossil fuel use
- Utilize abundant, local resource

Biomass Utilization in Plumas County

Biomass Thermal Opportunities	Current Heating Costs	Fuel Type	Gallons Used	Biomass Used	Savings
Portola District Heating Facility					
<i>Eastern Plumas Heath Care</i>	\$ 147,500.00	diesel fuel	37,000	400 bdt	\$25,075.00
<i>Portola High School</i>	\$ 79,500.00	heating oil	22,640	210 bdt	\$13,515.00
<i>Portola City Hall</i>	\$ 4,700.00	propane	2,582	15 bdt	\$799.00
<i>Portola Library</i>	\$ 5,500.00	propane	2,750	15 bdt	\$935.00
<i>Portola USPS Building</i>	\$ 4,000.00	propane	2,300	15 bdt	\$680.00
County HHS/FRC	\$ 135,000.00	electric/Prop.	17,000	200 bdt	\$45,000.00
USFS Supervisors Office	\$ 37,000.00	prop/fuel oil	11,500/3,260	100 bdt	\$24,500.00
USFS Mt. Hough RD	\$ 35,000.00	propane	14,340	115 bdt	\$20,625.00
Greenville K-12 School	\$ 112,500.00	diesel fuel	30,646	275 bdt	\$19,125.00
Chester Heating Facility					
<i>Wildwood Asst. Living Fclty</i>	\$ 60,000.00	propane	26,000	175 bdt	\$38,125.00
<i>Seneca Hospital</i>	\$ 80,000.00	diesel Fuel	21,000	210 bdt	\$53,750.00
Green Tons/Acre	10 to 15				
Bone Dry Tons/Acre	8 to 12				
Avg. price of chips (raw mtrl).	\$60.00				
Retail chips/bdt (thermal)	\$125.00				
Price of heat	83%				
<u>Thermal Network</u>					
Total biomass needed	1,705 bdt				
Acres treated	150 - 250				
<u>3 MW CHP</u>					
Total biomass needed	25,000 bdt				
Acres treated	2,100 - 3,200				

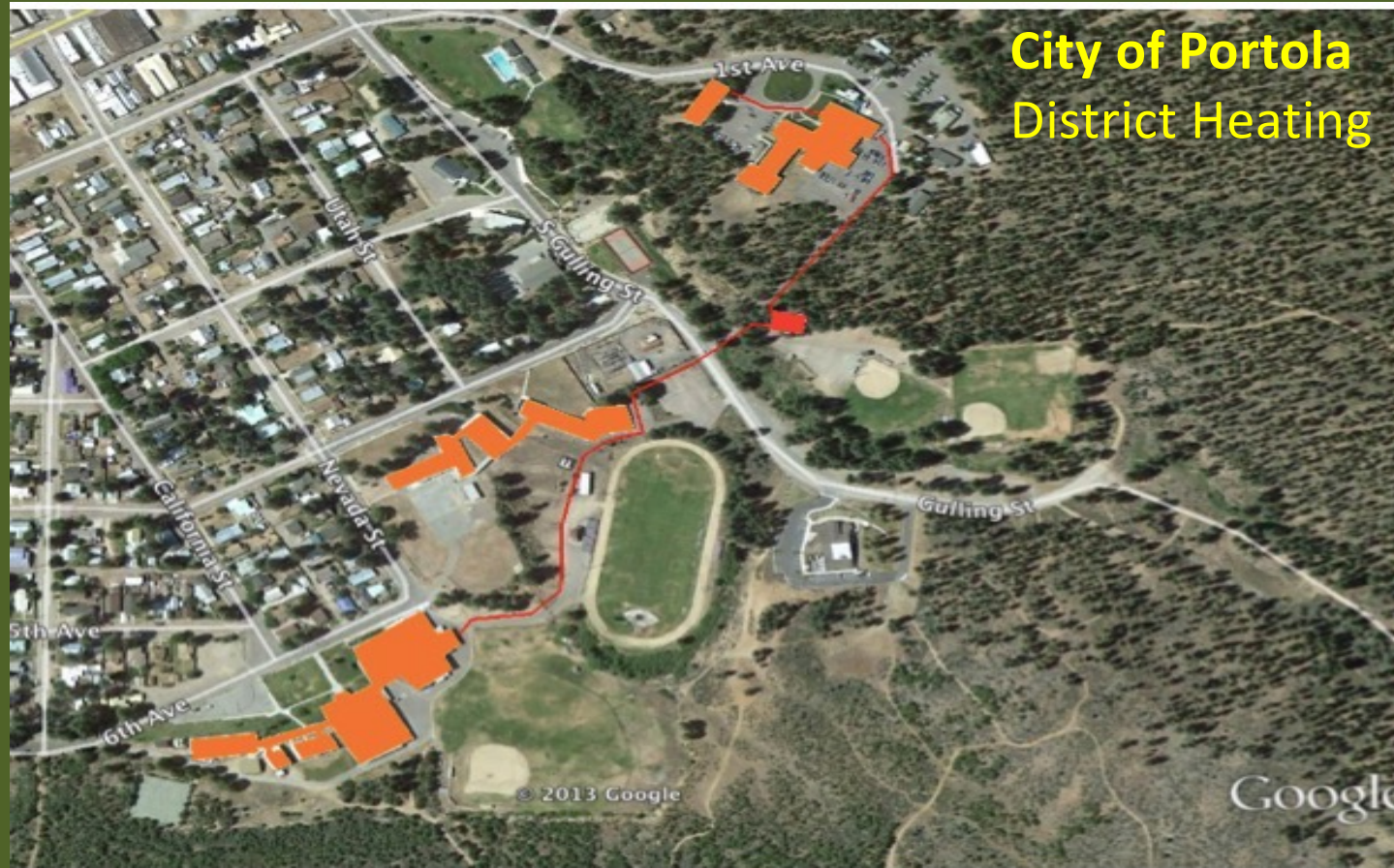
Increased biomass utilization in Plumas County will have the following annual results:

County wide savings:	\$197,129
Fossil fuel gallons offset:	170,018
Homes powered:	3000
Tons of biomass used:	27,000
Acres treated:	2,250 - 3,500

KEY

bdt: bone dry ton
CHP combined heat and power

City of Portola District Heating



Greenville Community Energy Facility



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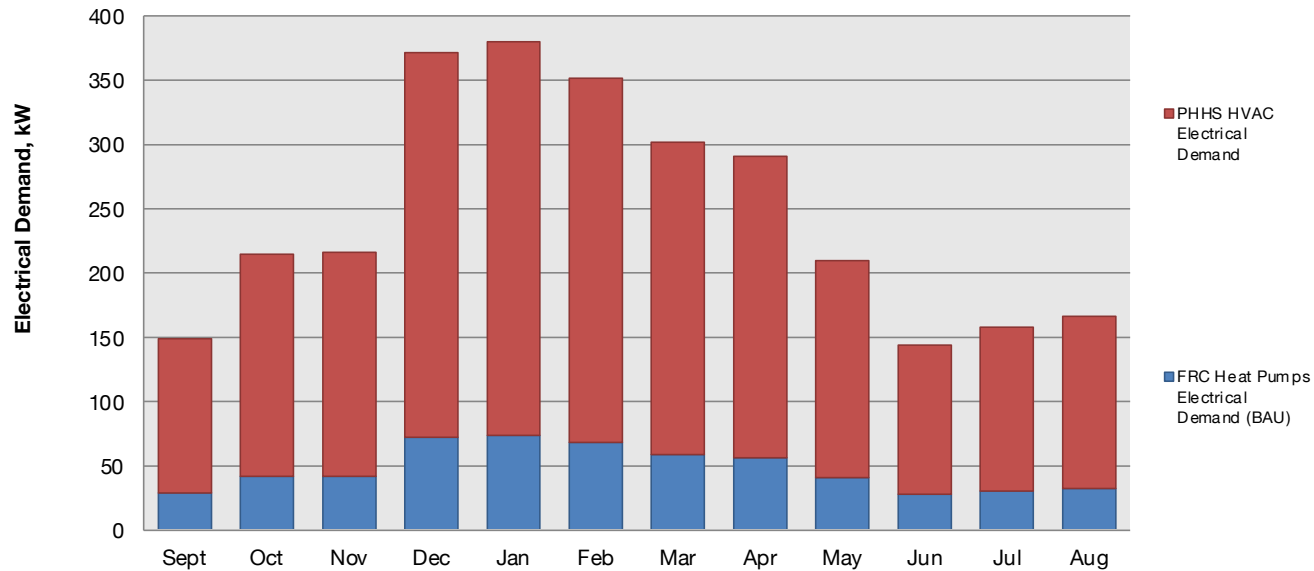
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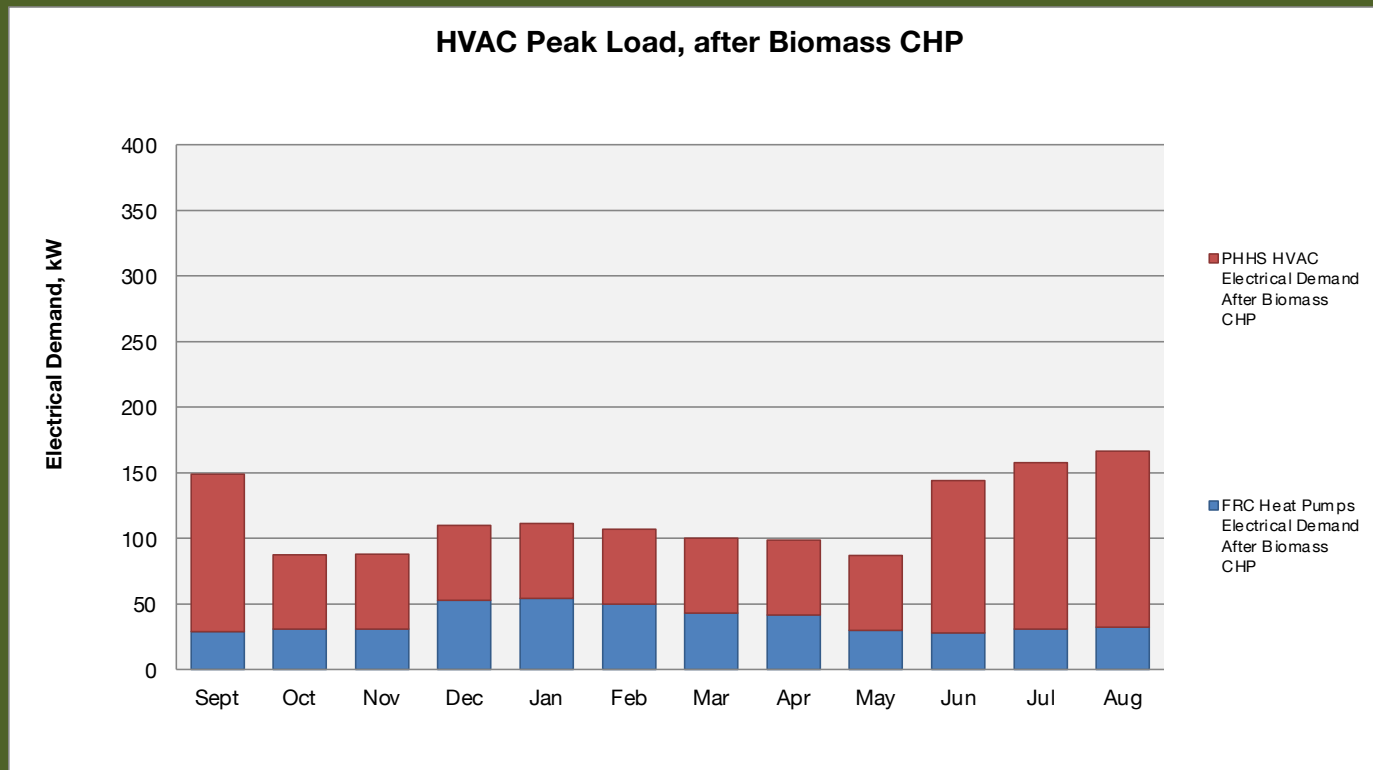
CHP: combined heat and power

Electrical Demand Reduction

HVAC Peak Load, Business as Usual



Electrical Demand Reduction



Sierra Institute's Role in the Plumas County Biomass Energy System

Identifying and addressing hurdles to implementing a sustainable system:

- Expensive capital infrastructure costs
- Challenge of initial years

Covering chip piles prior to chip shed



Chip shed constructed to improve chip quality



Covering Prohibitive Capital Costs

Item	Use	Cost
Boiler/Building	Providing heat and/or power derived from forest restoration derived biomass	\$2,500,000
Temporary use bin-hauling truck	Launch operation with affordable truck	\$22,000
CARB compliant truck	Support permanent operations	\$60,000
Storage Shed	Storing dry (enough) chips throughout the winter.	\$450,000
Chipper/conveyor system	Processing biomass at the site	\$150,000

Launching an independent stable operation

- Subsidizing operations in initial years with funding and free site and infrastructure use

Biomass transport to Crescent Mills subsidized

Biomass transport to Crescent Mills unsubsidized

Biomass Annual Operation Costs

Fiscal Year	Total Bins	Total Annual Cost	Cost per Bin	Comments
FY 18/19	N/A	\$51,434	N/A	First year operational. Owned and maintained by Sierra Institute under TESA Contract. Bins used were not tracked by this department. Biomass was generating power as well as heating water for the geothermal ground loop which supplies warmed water for ground-source heat pump units. Billing occurred by Sierra Institute by tracking the amount of BTU's produced by the Biomass on a monthly basis and billed the county for total amount of BTU's used during that month.
FY 19/20	47	\$84,442	N/A	Owned and maintained by Sierra Institute under TESA Contract. Biomass was generating power as well as heating water for the geothermal ground loop which supplies warmed water for ground-source heat pump units. Billing occurred by Sierra Institute by tracking the amount of BTU's produced by the Biomass on a monthly basis and billed the county for total amount of BTU's used during that month.
FY 20/21	21	\$12,125	\$577	TESA contract ended and the county assumed ownership and operational expenses of the Biomass. It was determined the generator was not of sufficient size to produce power efficiently and was taken off-line. The Biomass was now only being utilized to heat the water from the geothermal ground loop to supply 'warmed' water to the ground-source heat pump units at the Annex.
FY 21/22	14	\$6,007	\$429	Biomass used only for heating water to the ground-source heat pump units at the Annex.
FY 22/23	16	\$23,595	\$1,474	Biomass used only for heating water to the ground-source heat pump units at the Annex.
FY 23/24	15	\$44,240	\$2,949	Biomass used only for heating water to the ground-source heat pump units at the Annex.

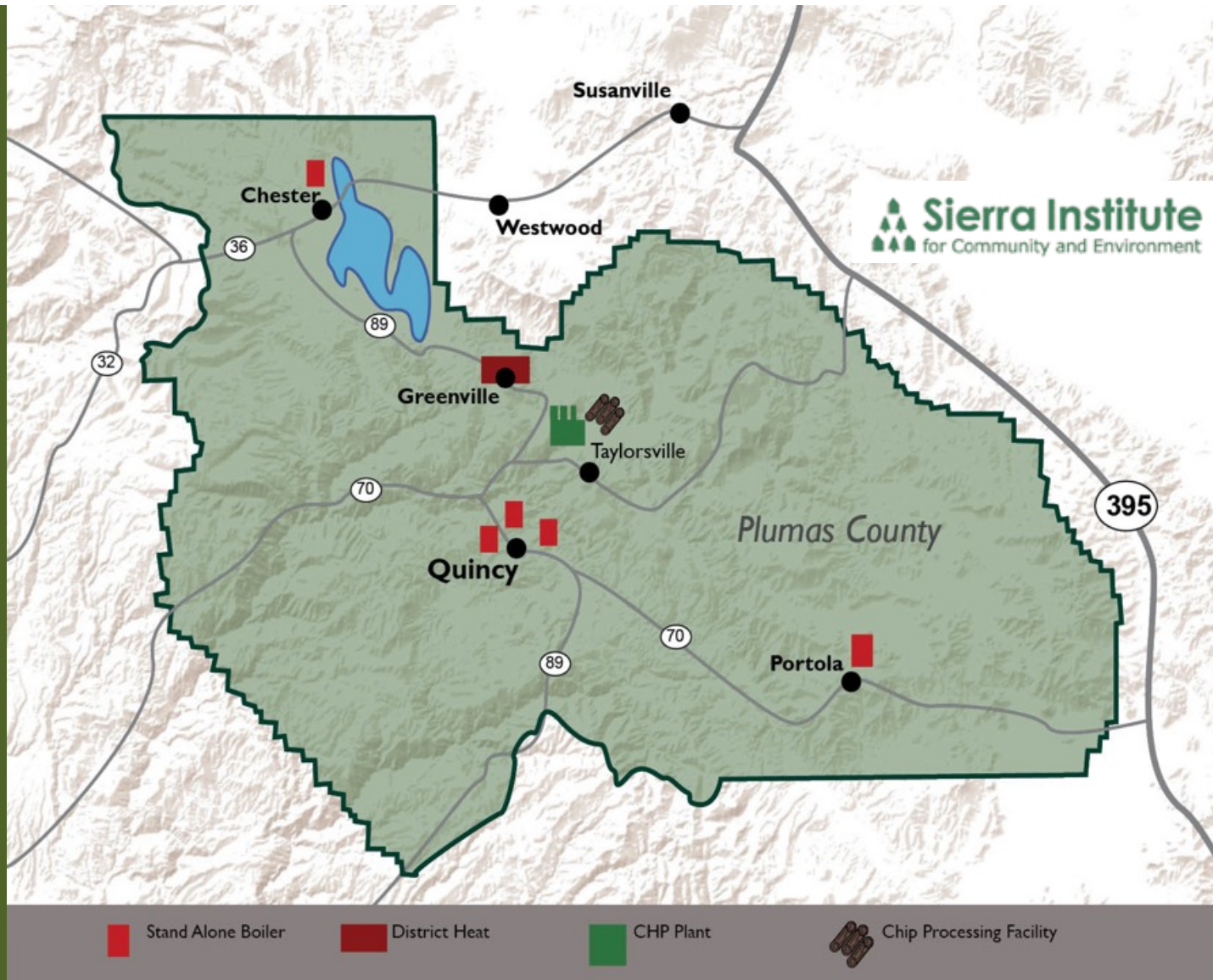
Moving Forward

- Subsidy while operations are small scale
- Secure contract/agreements that establish biomass sources, agreed upon rates, and billing schedules

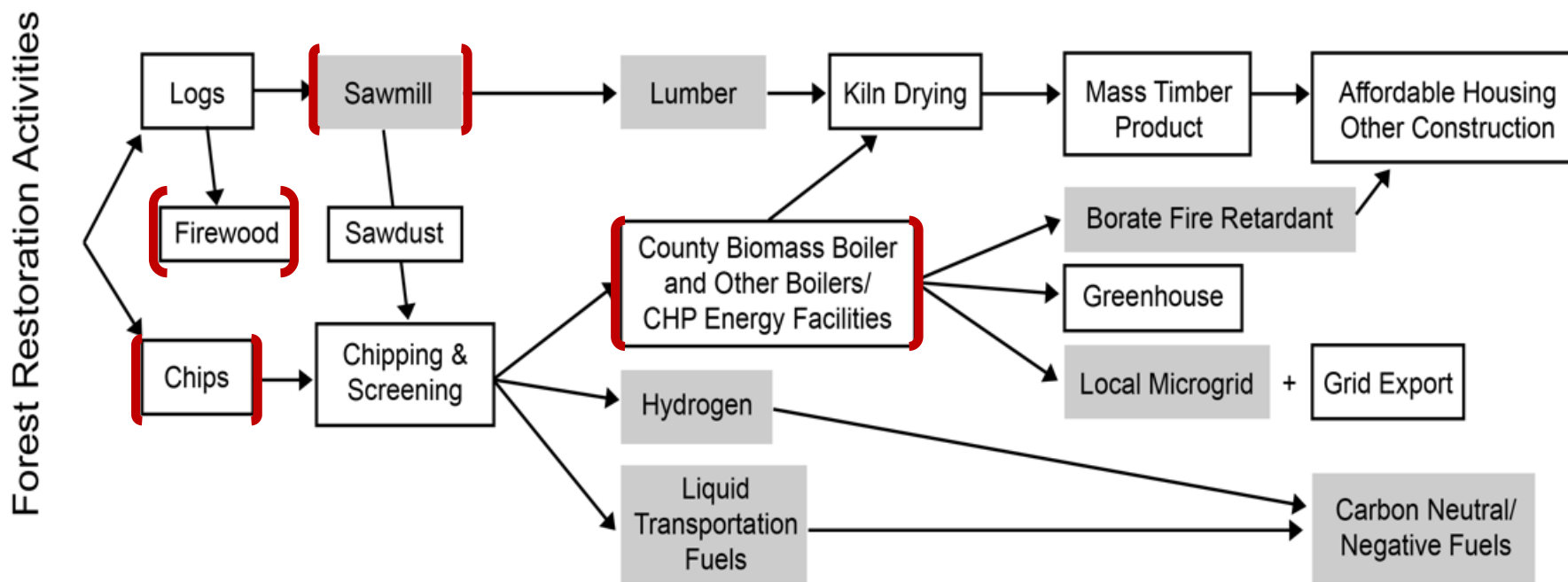
Long-term sustainability

- Roughly 5 boilers* of equivalent size needed to support an unsubsidized operation
- 1 boiler = 1 load/4 days = 8hrs/week delivery operation
- 5 boilers = 10 loads/week = 40hrs/week delivery operation

* Or equivalent business



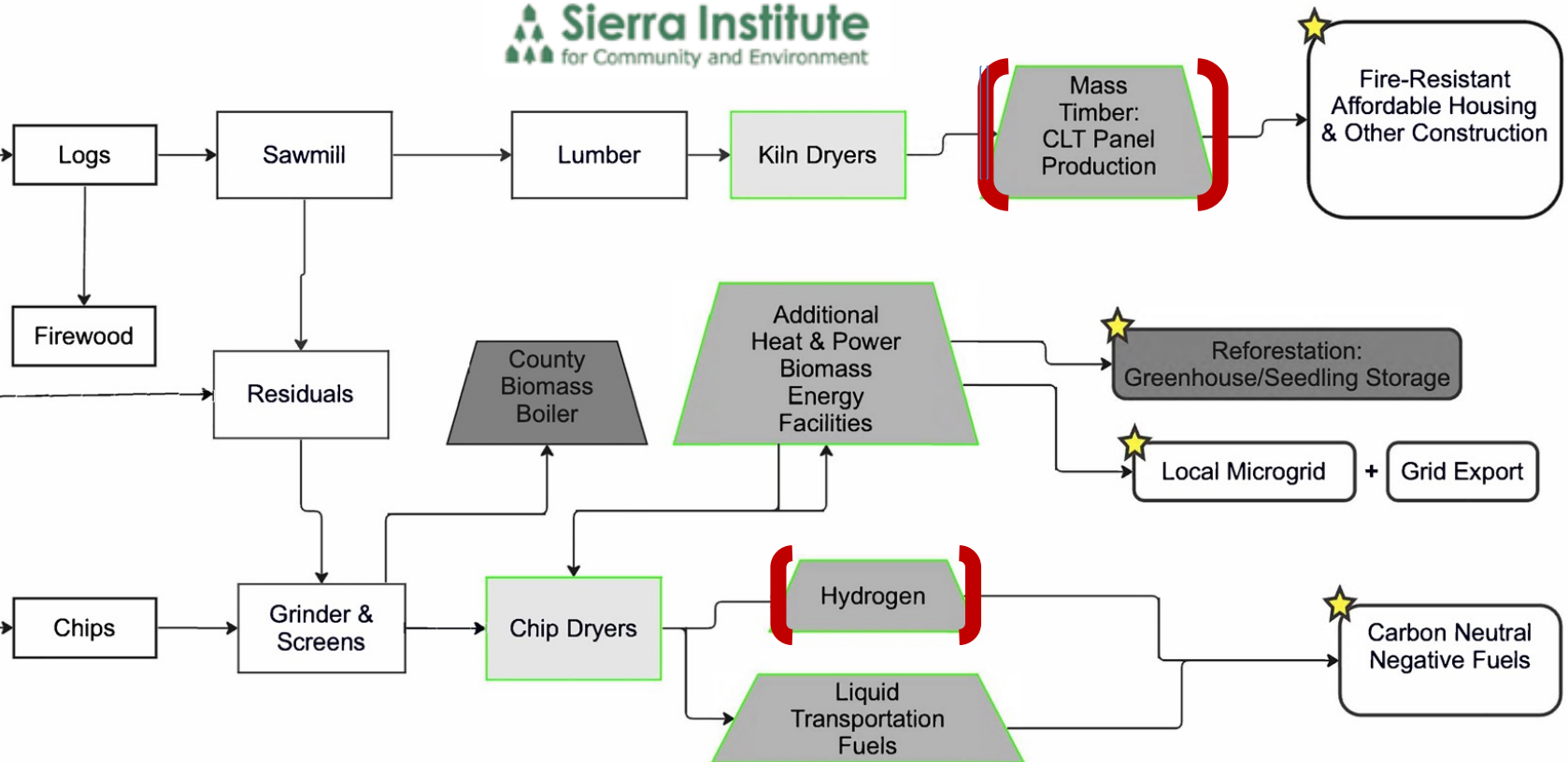
Indian Valley Wood Utilization Campus Process Flow Diagram



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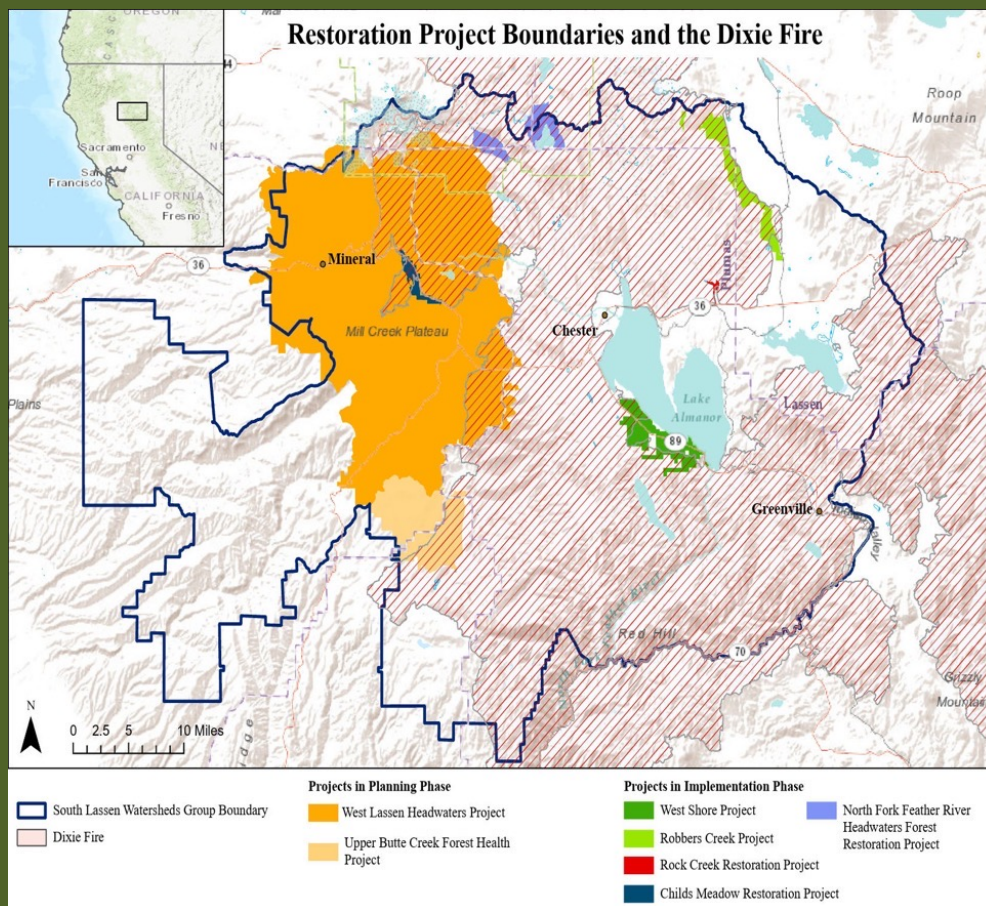


Forest Restoration Activities



Key Project Initiated In Progress Investment Opportunity Project Executed Targeted Success

Restoration Project Boundaries and the Dixie Fire

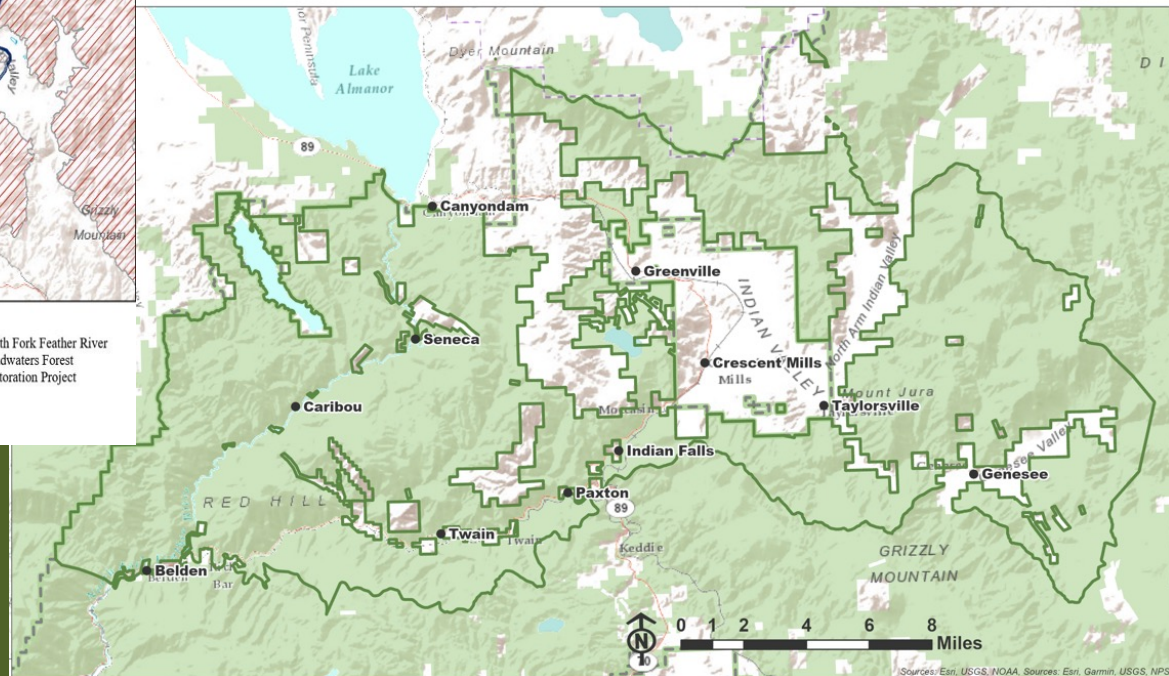


Landscape Restoration Projects:

- West Lassen Headwaters
- North Fork Forest Recovery Project

North Fork Forest Recovery Project

Sierra Institute
For Community and Environment





Roundhouse Council
Grand Opening
Ribbon Cutting
June 20, 2024 1pm
Greenville



Operation of the Courthouse Annex Biomass Facility

Thank you!