

FEEDSTOCK SUPPLY AVAILABILITY, COST AND CONTRACTING



**SIERRA COMMUNITY SCALE
BIOENERGY WORKSHOP**

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Presentation Overview

- Value Proposition
- Value-Added Uses
- Anatomy of a Feedstock Supply Assessment
- Contracting
- Observations



Value Proposition

- Confirm the key objectives.
- For example – For many rural communities the primary objective is addressing forest health and restoration.
- Seek out market based solutions to change business as usual practices and mitigate catastrophic events that impact forest ecosystems.



Woody Feedstock Value-Added Utilization

A variety of value-added end uses have evolved over time – Some are commercially proven and some are still in the RD & D Phases.

- Lumber products, composite panels, pulp
- Soil amendments
- Firewood
- Densified fuel pellets
- Animal Bedding
- Landscape cover
- Biofuels (ethanol, renewable diesel)
- Biomass power (generation or cogeneration)

Anatomy of a Feedstock Supply Availability Assessment

- Select General Vicinity
- Define Targeted Feedstocks
- Confirm Feedstock Sources
- Select Target Site
- Biomass Available – Gross/Technical/Economical
- Current/Potential Competition
- Current Market Values
- State and Federal Policies
- Prepare Five Year Availability and Pricing Forecast
- Future Supplies and Risks

Fuel/Feedstock Characteristics

A variety of value-added bioenergy related end uses have evolved over time. The conversion technology employed will be selected based on the targeted feedstock characteristics. Key physical characteristics include:

- Heating Value (Btu/dry pound)
- Moisture Content (% moisture)
- Sizing (typically 3" minus)
- Ash Content (% non-combustibles)
- Chemical Make-Up (nitrogen, potassium, lignin)

Feedstock Supply Sources

- Timber harvest residuals
- Forest fuels treatment residuals
- Forest products manufacturing residuals
- Urban wood waste
- Agricultural byproducts



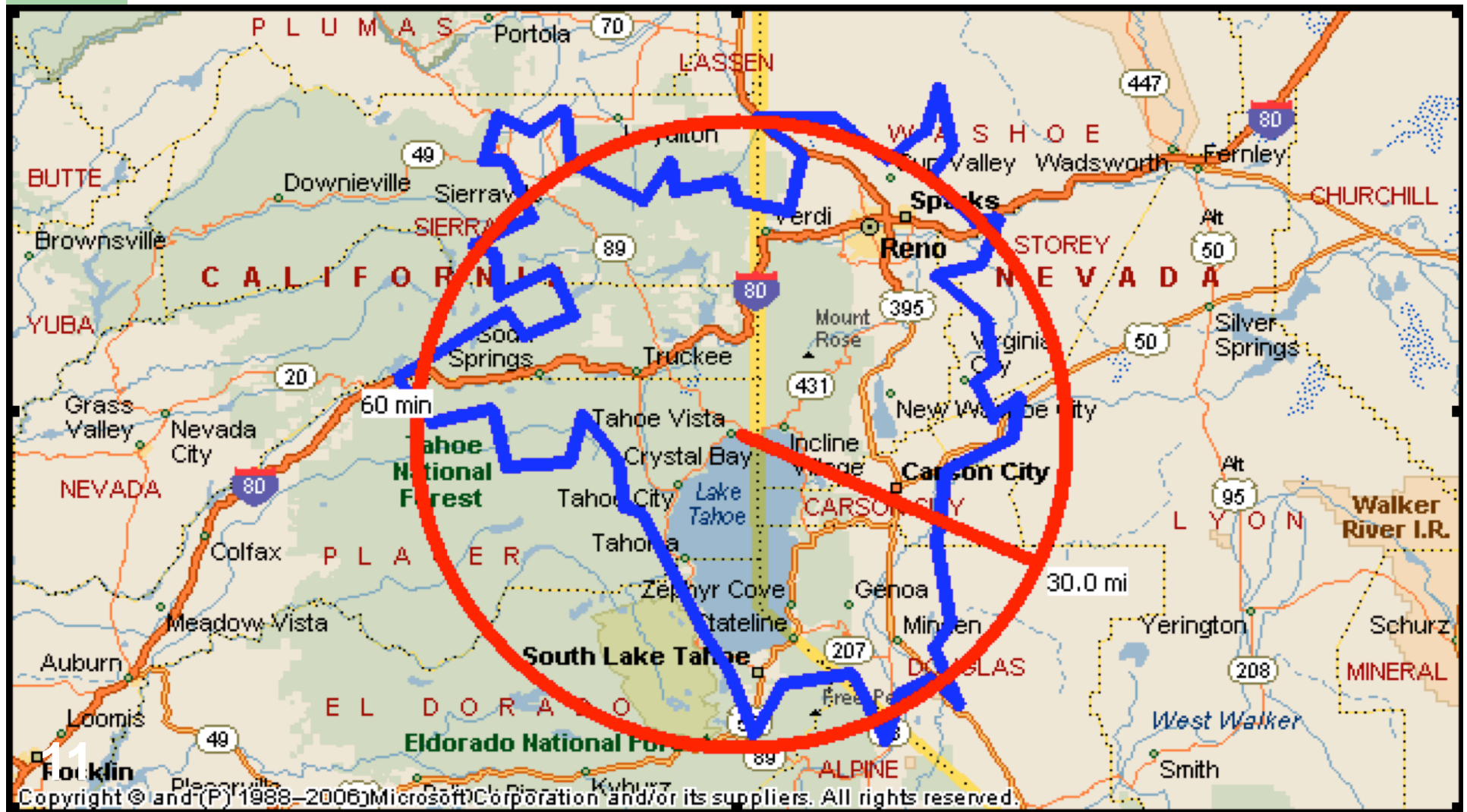




Feedstock Supply Assessment – Key Items to Consider

- Meets project objectives.
- Sustainable long term supply located within close proximity (30 - 75 mile radius).
- Economically available (accounting for current/potential competition, state/federal policies).
- Available in quantities and from financially viable sources that support project financing:
 - Minimum 10 year supply, 50% - 70% under contract.

Cabin Creek Project Target Study Area



Land Ownership/Jurisdiction Forest Vegetation Cover Within the North Fork TSA

LAND OWNER/ MANAGER	FORESTED ACRES	PERCENT OF TOTAL
Bureau of Land Management	5,520	1%
Bureau of Reclamation	3,313	< 1%
Department of Defense	914	< 1%
National Park Service	75,007	7%
Private	343,497	32%
State of CA	242	< 1%
USFS	636,845	60%
TOTALS	1,065,337	100%

Fuel Availability Assessment Filters

Three filters used to confirm availability of fuel/feedstock resource:

- **Potential** – Gross estimate.
- **Technical** – More refined based on physical recovery and resource policy factors.
- **Economic** – Very refined using current competition/demand, potential competition, community support and actual costs to harvest, collect, process and transport.

Current Competition

- Assess current uses/competition for fuel/feedstock.
- Examples include:
 - Other bioenergy projects.
 - Furnish for composite panel manufacturing.
 - Raw material for soil amendment/landscape cover.
 - Feedstock for densified fuel pellet facility.

Potential Competition

- Assess potential uses/competition for fuel/feedstock.
- Examples (same as those listed on previous slide) include:
 - Other bioenergy projects.
 - Furnish for composite panel manufacturing.
 - Raw material for soil amendment/landscape cover.
 - Feedstock for densified fuel pellet facility.

Key State and Federal Policies

- List existing policies that impact fuel/feedstock availability and pricing. Some may only be available for defined periods or are currently being considered:

Federal

Stewardship Contracts

Collaborative Forest Landscape Restoration Act

State

Oregon Biomass Producers Tax Credit

Senate Bill 705

Future Fuel Supply Sources and Risks

- Emerging technologies may improve fuel or feedstock recovery.
- Proposed state or federal policies may improve or reduce fuel recovery options.
- External factors such as housing starts, or diesel pricing that may impact future supplies/economics of fuel recovery/transport.

Collection, Processing and Transport Costs To NF Mill Site

BIOMASS MATERIAL SOURCE	DELIVERED MATERIAL	LOW RANGE	HIGH RANGE
Timber Harvest Residuals – USFS (Bass Lake RD)	Chips	\$45/BDT	\$60/BDT
Timber Harvest Residuals – Private land	Chips	\$45/BDT	\$60/BDT
Pre-Commercial Thinning Activities – USFS (Bass Lake RD)	Small Logs	\$34/GT	\$40/GT
Fuels Treatment Activities – USFS (Bass Lake RD)	Chips	\$45/BDT	\$60/BDT
Fuels Treatment Activities – Eastern Madera County Fire Safe Council	Chips	\$50/BDT	\$70/BDT
Fuels Treatment Activities – Coarsegold Resource Conservation District	Chips	\$50/BDT	\$70/BDT
Urban Wood Waste – Local landfills and transfer stations	Chips	\$40/BDT	\$50/BDT

Feedstock Contracting

- Memorandum of Agreement
- Letter of Intent
- Short Term Purchase and Sale Agreement
 - Usually 6 to 12 month term
- Long Term Purchase and Sale Agreement
 - Typically 3 to 5 year term
 - Escalation clause (CPI/NYMEX Diesel Price)
 - Price adjustment tied to feedstock quality

Bioenergy Project Development - Deal Killer Issues to Consider

- Fuel/Feedstock Supply
- Community Support
- Offtake Agreements
- Project Economics
- Appropriate Conv. Technology
- Siting/Infrastructure & Permitting





Tad Mason, CEO TSS Consultants
Rancho Cordova, California
916.266.0546
tmason@tssconsultants.com

www.tssconsultants.com