



Proposed On-Site Green Waste Utilization: South Tahoe Refuse

TRPA Forest Health and Wildfire Committee

February 22, 2023

Kat McIntyre, PhD- TRPA

Meagan Hartman- Wisewood Energy

Overview

History and Background

- FHWC- November 2022
- Environmental and Social context

Proposed Project and Compatibility

- Proposed project specifications
- Environmental, health, and safety compatibility

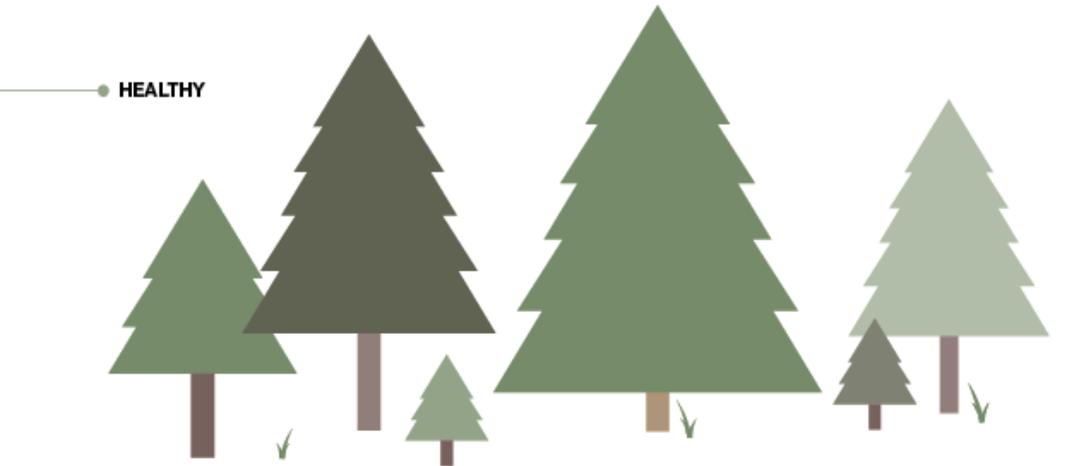
Next Steps and Recommendation

Environmental Context

- Forests today at risk for a variety of reasons:
 - Fire suppression
 - Commercial harvesting of the largest trees
- Homogenous, dense, overstocked forests
 - Lack the resiliency to survive natural disturbances such as insects and disease, drought.
 - Exacerbated by climate change.

Figure 10

Comparing the Potential Impacts of Healthy and Unhealthy Forests



Sporadic small trees and brush, comparatively more large and older trees, 40-60 trees per acre

- Smaller and less intense wildfires.
- Increased forest resilience to pests, drought, and disease.
- Greater mitigation against climate change.
- Protected and potentially increased water supply.



Prevalent small trees and brush, comparatively fewer large and older trees, 100-200 trees per acre

- Increased risk of severe forest fires.
- Less resilient forests, large numbers of dead trees.
- Loss of carbon sequestration benefits, potential increase in emissions.
- Threats to water supply and quality, and to hydropower generation.

History: Biomass in the Basin

- 2010 proposed 2MW commercial-sized biomass facility proposed in Kings Beach
- Concerns over air quality, noise, traffic, and proximity to community services.
- 2012 Regional Plan update included a prohibition on acceptance of applications



Current Code Language: Chapter 65.1.F.

F. Biofuel Facilities

TRPA shall suspend acceptance of applications for biofuel facilities until further research demonstrates the safety and environmental compatibility of such facilities.

Biofuel Facilities

Facilities that combust or gasify forest and other plant materials in a manner that, in combination with other systems, generates electrical energy for use or distribution or generates heat for distribution within a building or facility. Any heating unit that meets the definition of a wood heater is not considered a biofuel facility.



SOUTH TAHOE REFUSE CLEAN ENERGY TECHNOLOGY PROPOSAL



South Tahoe Refuse
& Recycling Services



TRPA Forest Health & Wildfire Committee
Proposed Project Presentation

February 22, 2023



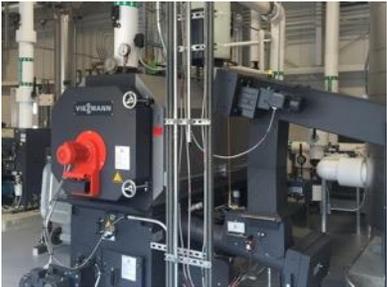
SCALES OF WOOD ENERGY



Industrial Process Heat



District Heating



Single Building Space Heating



Net Metered CHP



WE

Power Export



“CHP” = Combined Heat-and-Power

Increasing Scale

PROPOSED WOOD ENERGY SYSTEM

- Proposed STR system is **small-scale, net metered** CHP gasifier
- Net metering **offsets energy used on-site** – no power sales to grid
- Energy produced 24/7, making gasifier a tool for **energy resilience**
- Gasification “bakes” woody material – **not direct combustion**
- 125kW estimated to **offset >100%** grid electricity and **>90% natural gas** usage at STR site on annual basis
- Examples of wood energy projects in or nearing construction include:
 - District energy plant at **Northstar Community Services District** in Placer County California
 - District heating for **Mount Bachelor Ski Resort** in Deschutes County Oregon
 - 2 MW power plant in **North Fork California**
 - 125 kW CHP system supporting a wood yard in **Tuolumne County California**

Modern, small-scale wood energy systems are common across the world, including a gasifier in South Tyrol, Italy; CHP in Quincy, CA; gasifier in Italy; district energy in Lech, Austria (pictured below).





STR Clean Energy Technology Proposal

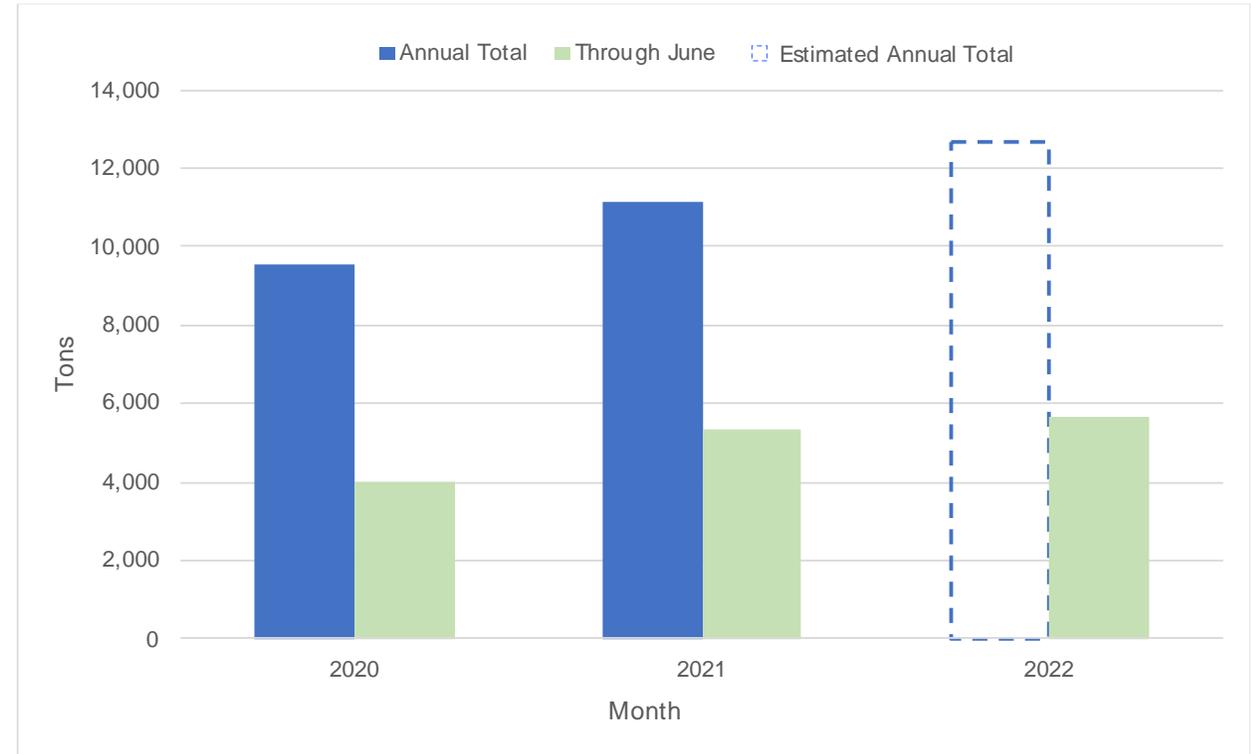
ENVIRONMENTAL & SAFETY IMPACTS

Fuel Demand



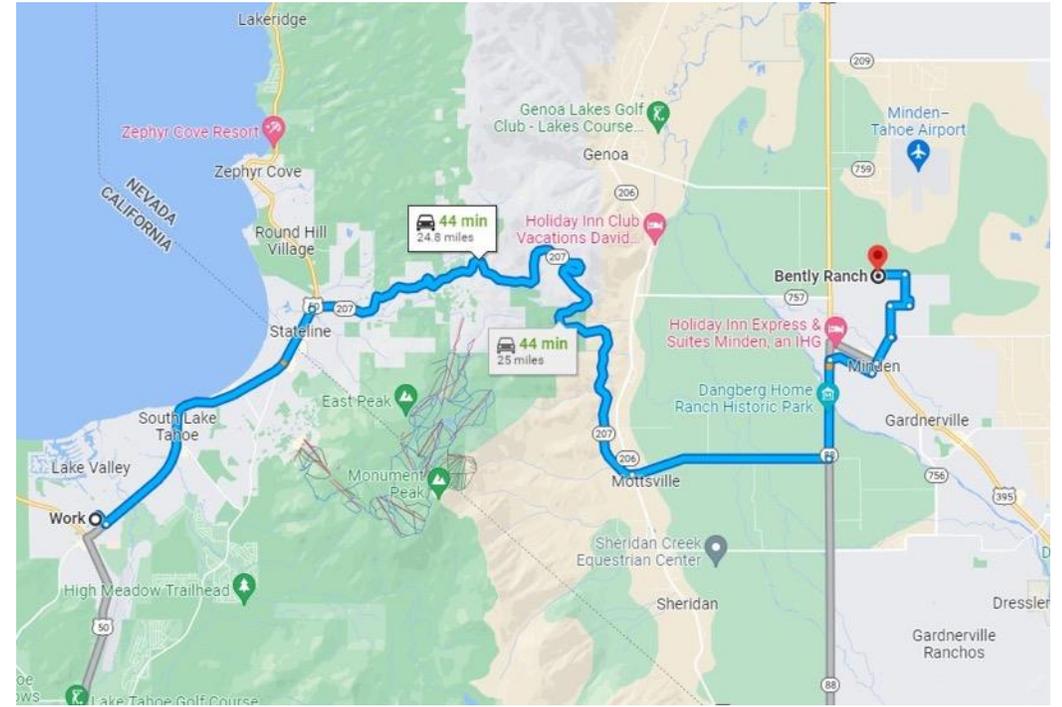
- STR receives and processes **~10,000 tons** of woody material each year, sourced from:
 - Defensible space and fire mitigation
 - Green yard debris
 - Clean construction and demolition material
- **Trending upward** from fires and increasing defensible space thinning
- Proposed wood energy system would use ~1,000 tons per year, or **10% of what STR currently handles**

Tons of woody material received at STR and transported out of the Tahoe Basin for composting. Annual total for 2022 is estimated based on data available through June.



Project is not expected to incentivize new fuel reduction treatments in near term, but may contribute to community discussion about value of appropriately-sized wood energy

	NO ACTION	WITH GASIFIER
AVG TRIPS/YR	700	628
MILES/YR (ROUNDRIP)	34,650	31,050
PM (LB/YR)	23.38	20.95
CO (LB/YR)	214.12	191.87
CH ₄ (LB/YR)	0.73	0.65
NO _x (LB/YR)	600.19	537.83



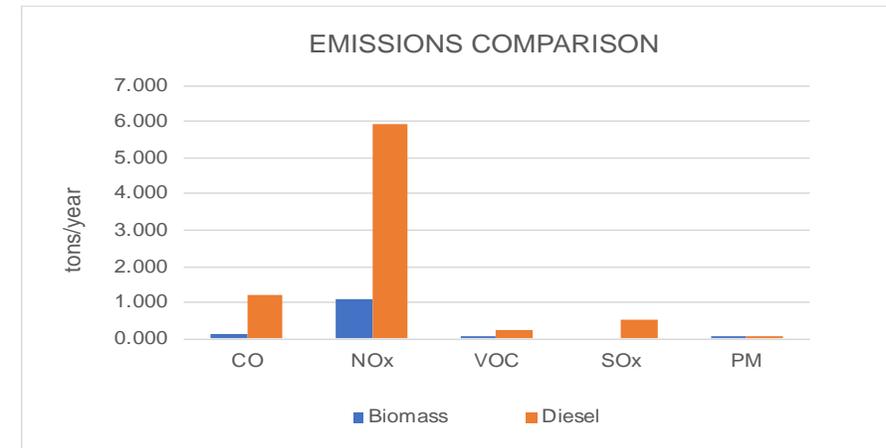
- STR currently transports chipped woody material 50 miles roundtrip out of the Basin for disposal as compost
- Gasifier system will:
 - **Reduce truck traffic** by about 72 trucks per year
 - **Reduce miles driven** by about 3,600 miles per year (roundtrip)
 - **Reduce associated emissions, truck noise, and safety concerns**

- **Low emission rates**, with potential offset needed for NOx
- **No visible smoke** during normal operations
- As energy resilience system, much **lower emissions** compared to similarly-sized diesel generator
- Additional emissions analysis can be completed at later stage

POLLUTANTS	EMISSION THRESHOLDS	PLANT EMISSIONS
ROG (LB/DAY)	82	0.027
NO _x (LB/HR)	0.068	0.498
CO (LB/HR)	3.7	0.038
PM ₁₀ (LB/HR)	0.41	0.019



190kW system running at full capacity and showing no visible smoke, located in South Tyrol, Italy.



Comparison of annual criteria pollutant emissions between a 125kW waste wood gasifier and a representative Tier 3 125kW diesel generator.



IN SUMMARY

The proposed project will:

- Use waste woody material already being collected and processed by STR
- Decrease the number of waste hauling trucks traveling out of South Lake Tahoe
- Have minimal emissions and no visible smoke during operations
- Be contained within the current property footprint
- Have similar noise levels as current operations
- Represent a distributed renewable energy system that will offset on-site energy usage, not sell power to the grid
- Pilot a small-scale system that can help meet local goals for 100% 24/7 renewable energy

NEXT STEPS

Should the project be allowed to move forward:

- Complete more detailed analysis for permitting purposes
- Develop detailed engineering and incorporate considerations for emissions, noise, etc.
- Submit permit application for TRPA review

Next Steps

- Staff feel the information provided by Wisewood Energy and STR is sufficient to allow TRPA to accept an application for review.
 - Motion for the Forest Health and Wildfire Committee to recommend the TRPA Governing Board direct the Executive Director to accept an application for review.
- A submitted application would come to the TRPA Governing Board for final review in 2023.
- Staff in partnership with Tahoe Conservancy have an opportunity to look more regionally at biomass utilization within the Tahoe Basin.

Questions and Discussion

Public Comment

A motion to recommend the Governing Board direct the Executive Director to accept an application from South Tahoe Refuse for an on-site small biomass project at its collection facility.