



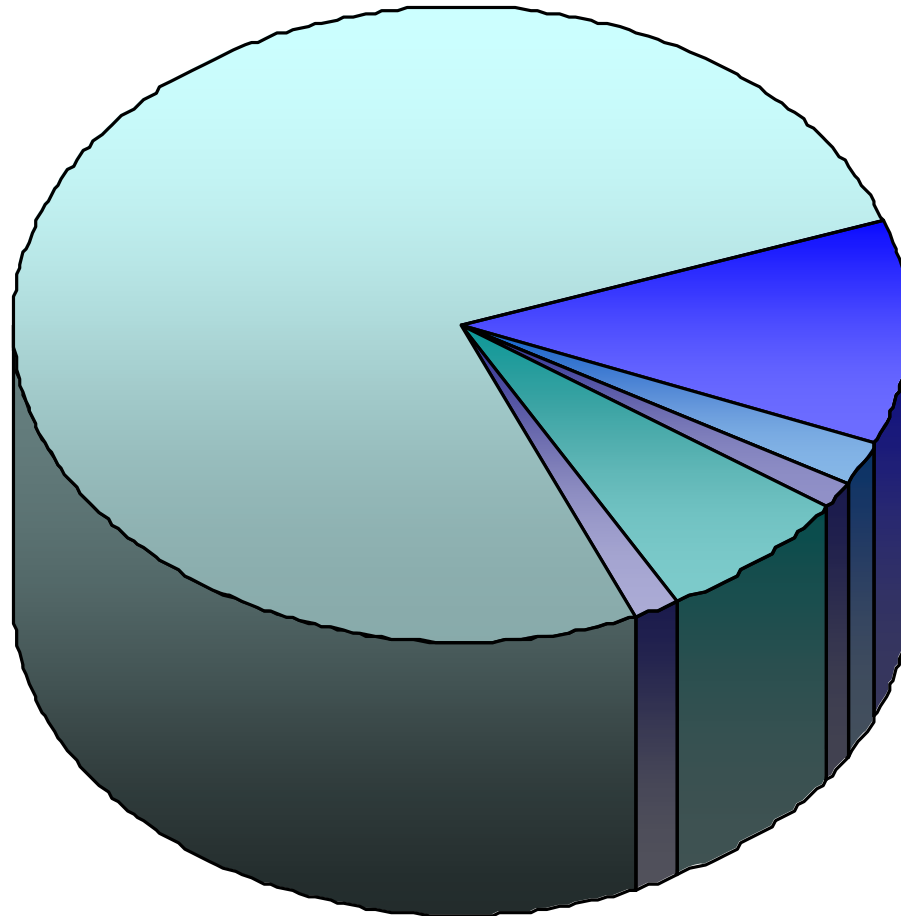
Biomass Benefits 101

Recently thinned forest, Eagle Lake Ranger District, Lassen National Forest

Benefits to Air Quality

cents per kwh

Relative benefit of biomass
use vs. open burning
NREL Study (Gregg Morris)



SOx = 0.01¢

NOx = 0.13¢

PM-10 = 0.71¢

CO = 0.15¢

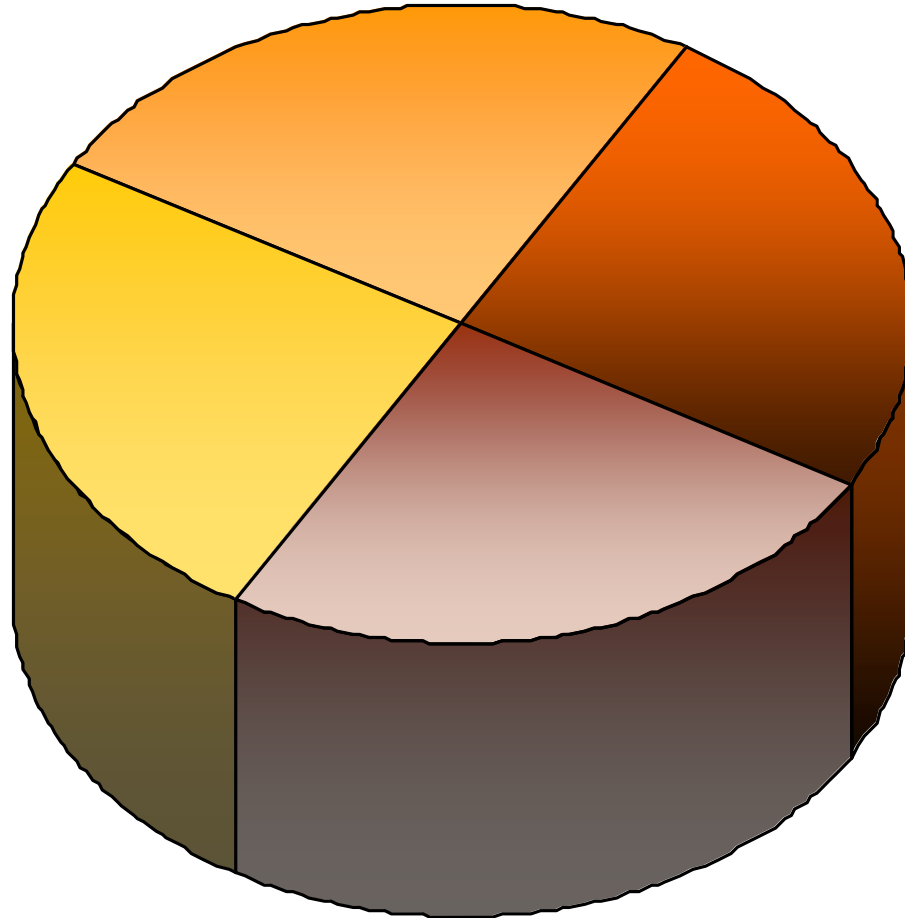
Methane = 7.52¢

Non-Methane HCs = 1.1¢

CO2 = -0.23¢

Total = 9.39¢ / kWh

Societal Benefits



■ Rural Jobs

4-5 Rural Jobs per MW
(WGA Report)

Stable, family wage jobs

■ Recreation/Scenic

Protection or
maintenance of scenic values
and recreation opportunities

■ Public Health

Respiratory impacts

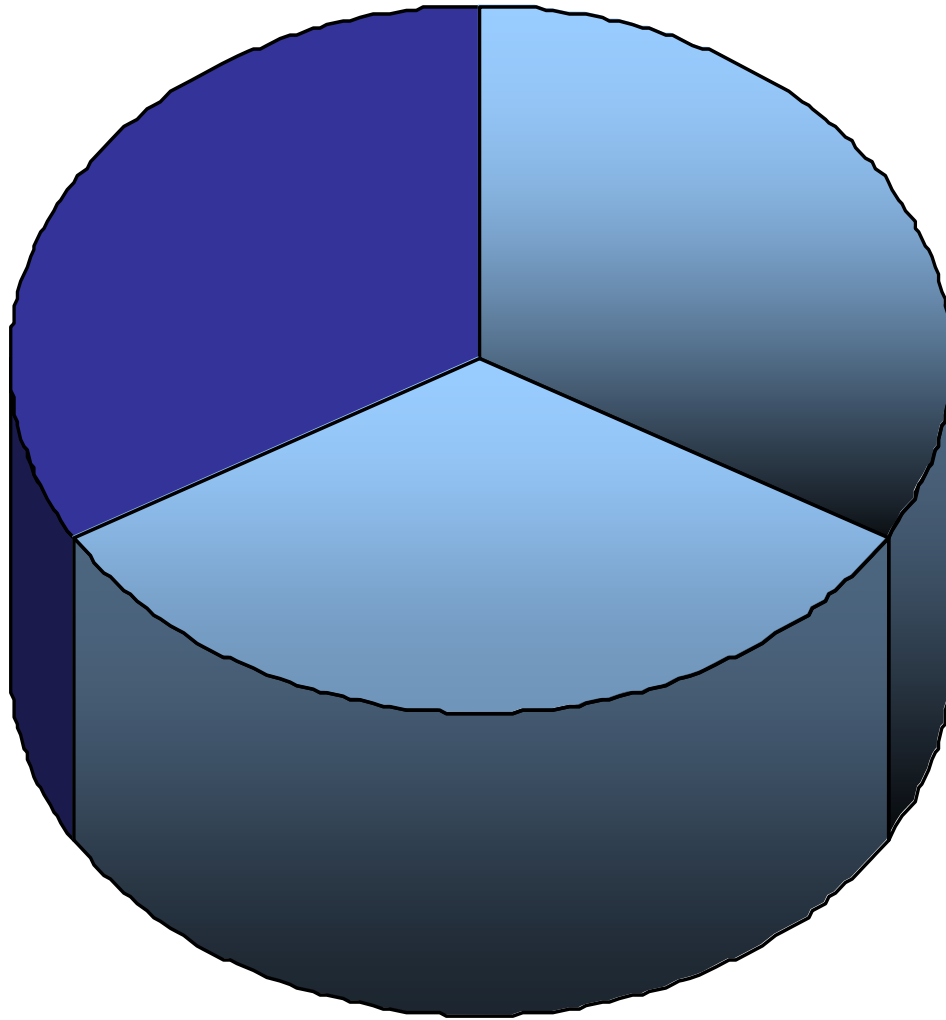
Smoke & fire related safety,
injuries, or mortality

■ Lost Productivity

Facility, traffic, and fire closures

School or business closures

Benefits of Converting Waste to Energy



■ Landfill Diversion

Avoided siting, permitting

Reduced need for compaction

Increased recycling capacity

■ Energy Security

RECs = 1.0 ¢/Kwh

Foreign debt and trade

National and economic
security

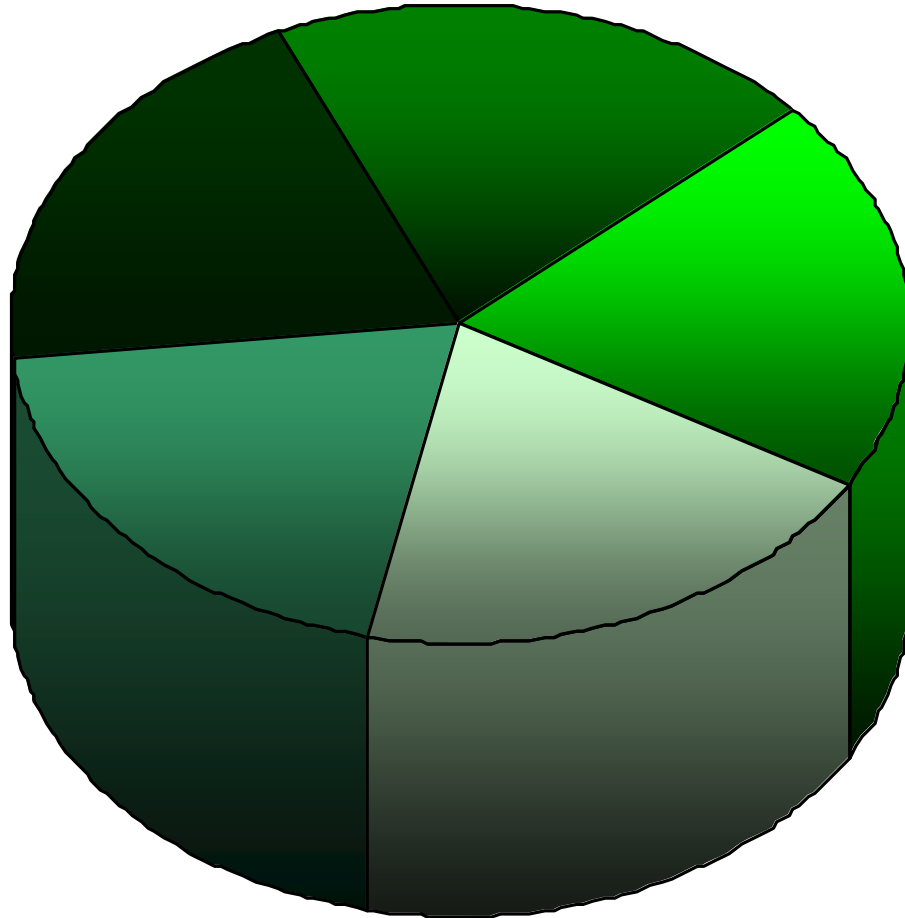
■ Grid Stability

Load centered, off-grid

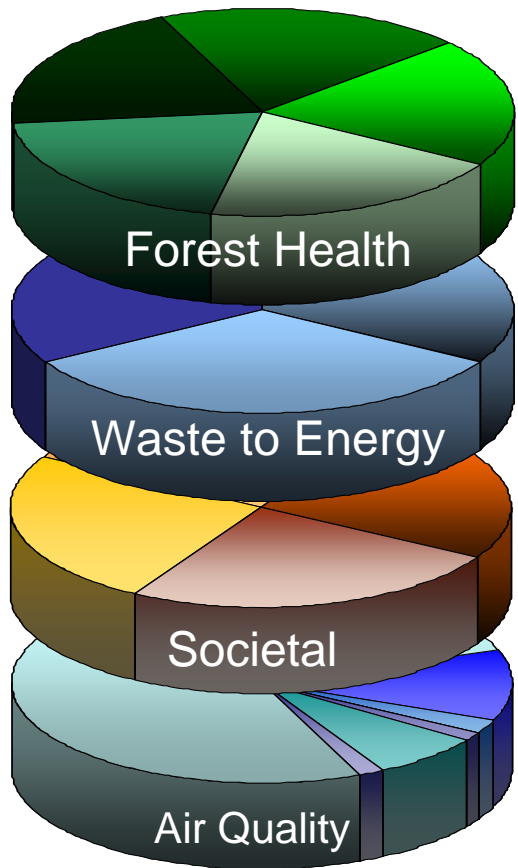
Line voltage support

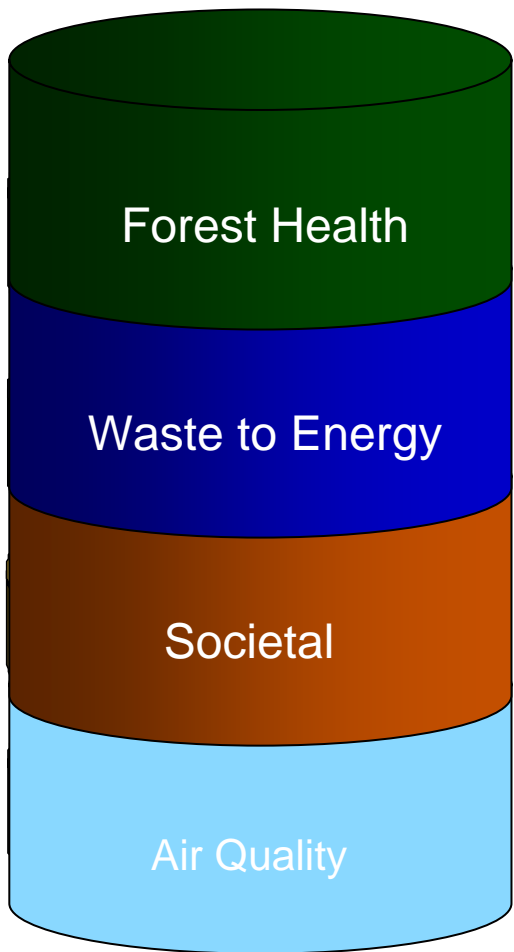
24/7 energy capacity

Forest Health Benefits



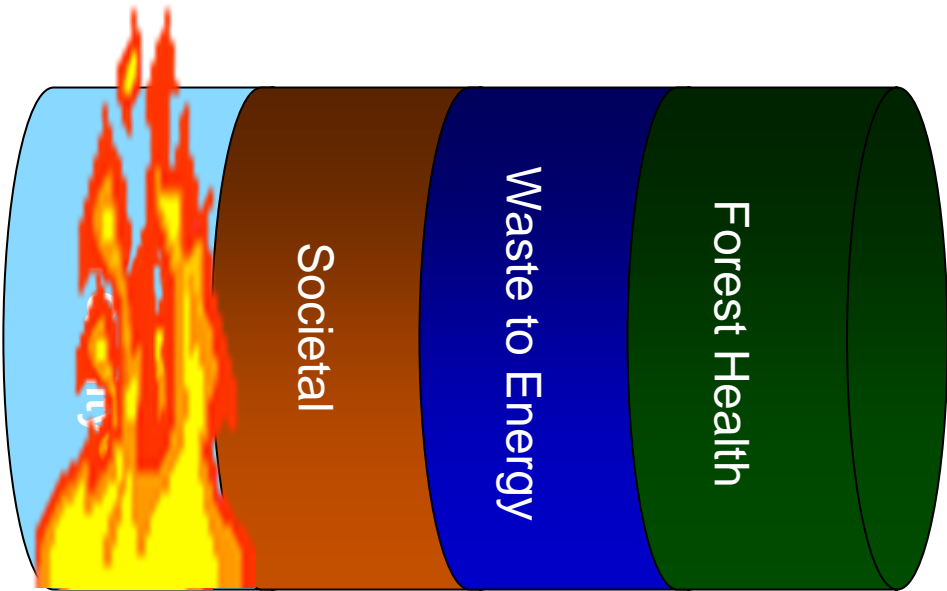
- **Forest Health**
 - Wood and biomass value
(Eagle Lake RD = \$267/acre)
 - Increased fiber yield and value
 - Reduced insects and disease
- **Fire Prevention**
 - Avoided Wildfires = \$856/acre
 - Public & Private Property Values
 - Avoided Rehab Costs
- **Wildlife Enhancement**
 - Protect snags & downed logs
 - Improved fish and wildlife habitat
- **Watershed Protection**
 - Avoided sediment delivery
(Hayman Fire = \$268/acre)
 - Increased water quality, yields and timing
- **Range Improvement**
 - Improved Rangelands and Forage





Benefits

**Go Up In
Smoke**

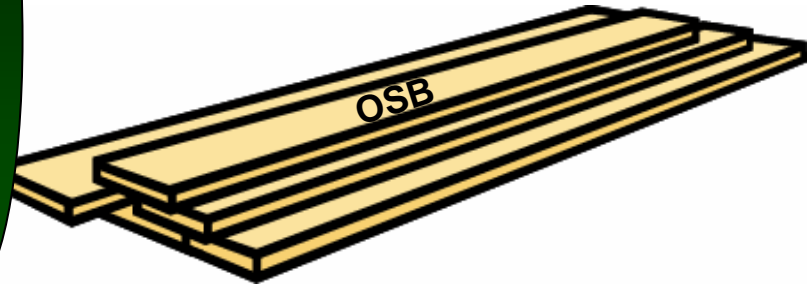
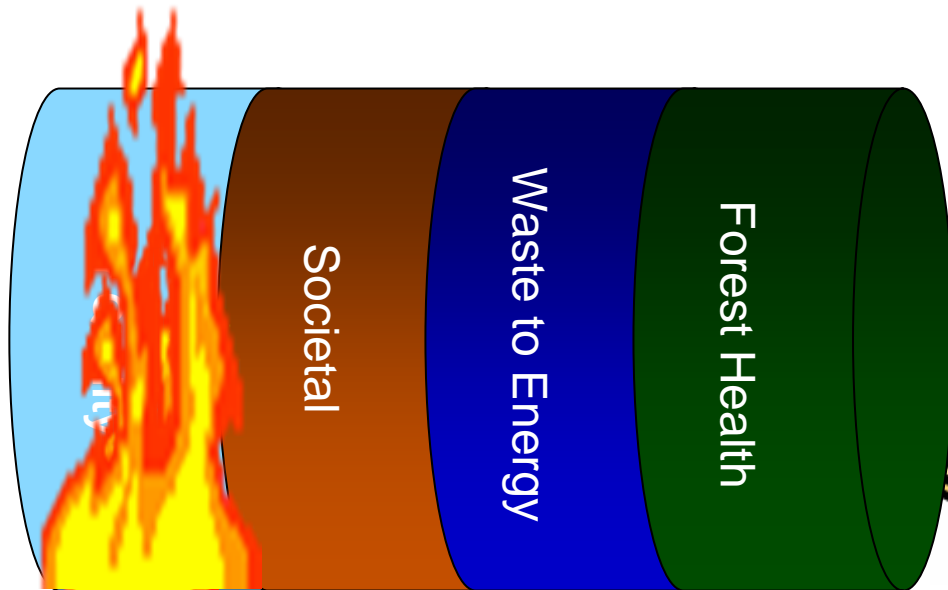


Benefits

**Go Up In
Smoke**

vs

**Creating
Social,
Environmental
and Economic
Benefits**





**Benefits
Go Up In
Smoke**



**Creating
Social,
Environmental
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vs.

